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A community based study on perceived knowledge of diabetes on cause, control, prevention and complications among diabetic patients in Bengaluru city

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ABSTRACT

Background: The numbers of diabetes mellitus cases are increasing among all sections of Indian population. The knowledge about the disease, associated complications and co-morbidities are not satisfactory among the public including diabetic patients. The objective of the study was to assess the perceived knowledge and determining factors on onset, control, prevention and complications of diabetes mellitus in urban area of Bengaluru.

Methods: A cross sectional, descriptive and community based study with a sample size 770 randomly selected known diabetics was conducted during May to July 2016 in Bengaluru city by direct interviewing them at their doorsteps using pretested questionnaire. The data contained information about the socio-demographic profile, knowledge about the warning signs, complications, controllability, consequences and co morbidities. Data was analysed in SPSS version 18.

Results: There were 43.7% and 57.5% of males and females respectively. Seventy percent of females were homemakers and two third were literates. The maximum numbers of subjects were in the age group of 41-60 years with mean age of 56±11.6 years. Family history of diabetes was present among 40%. The median duration of diabetes was 48 months (range 1 to 360) and 38% of the subjects had co morbid conditions related to cardiovascular diseases and other systems. The perceived knowledge related to prevention, complications, consequences and controllability of diabetes was not adequate in relation to their literacy status, family history and duration of diabetes. The overall perceived knowledge was better among females than male subjects.

Conclusions: The perceived knowledge about the different aspects of diabetes care at the personal level of diabetics were inadequate and needs periodic counselling as intervention measures.

Keywords: Diabetes, Knowledge, Perceived, Duration, Consequences, Controllability

INTRODUCTION

The prevalence of diabetes mellitus is increasing at alarming rate in South East Asian countries especially in India. The increase in number of pre diabetes and diabetes mellitus is not in proportion to the developments in technologies, socio economic class, physical activity, food consumption and different occupations.¹ It is

estimated that India will have 109 million diabetes by the end of 2035.²

The early diagnosis of the pre diabetes and diabetes is delaying among all age groups due to lack of specific symptoms in the target individuals. The awareness about the suspected symptoms of diabetes mellitus and seeking health care in controlling is not to the appreciable level among public.

The literacy status will not determine in creating awareness similarly the false myths or misbelieve about the onset, treatment and diet are obstacles in considerable proportion of cases for seeking early treatment and prevention of complications. This has been observed in both rural and urban areas in India.^{3,4}

The co-existing diseases or morbidities are facilitating the damages to the organs or target cells in Diabetes Mellitus patients and progression in onset of complications are much faster compared to people without co- morbidities. The perception of diabetes as illness and awareness about complications and interventional factors to reduce them are limited among the people in different parts of the country.^{3,4} There is need of studies to highlight the issues in order to minimize the period of diagnosis and control measures in individuals. This study highlights the knowledge and perception among diabetics on diagnosis, treatment and complications in developed urban area of India. This study is conducted with an objective to assess the perceived knowledge and determining factors on onset, control, prevention and complications of diabetes mellitus in urban area of Bengaluru.

METHODS

A cross sectional, descriptive and community based study was carried out in the ward numbers 23, 30, 32 and 33 of Bengaluru city in the population of 1,67,000. The study period was two months from May to July 2016. The subjects for the study were selected randomly for the required sample size of 770 from different localities. The inclusion criteria as subjects for the study were diabetic patients aged 18 years and above. The importance of the study was explained to the subjects and data was collected from the subjects who consented to participate. The data was collected at the door steps of the subjects by the investigators after establishing the rapport. The characteristic of area is similar to the study conducted in this area.⁵

The data collection tool was the structured, pilot tested, semi open ended questionnaire and collected by direct interview technique. The reliability of the information was verified in small proportion of samples by repeat interview by the other investigator. The time consumed for collecting data from each subject was varying from 15 to 30 minutes (average 20 minutes).

The data contained information on four parts. The first part included socio demographic characters of the subjects such as name, age, sex, occupation, education, residency status etc. The second part on the duration of diabetes mellitus symptoms at the time of diagnosis, treatment modalities etc. Third part about the awareness on the symptoms of diabetes, age at onset, causes for diabetes, risks for getting diabetes, etc. Fourth part included the awareness and perception about treatment, prevention and listing of complications and prevention of diabetes etc. The questionnaire has the scope of

collecting more than one answer for most of the variable used in the data.

Data was cleaned and entered in to Microsoft Excel for analysis purpose. The information obtained on occupation status was classified into categories as unemployed, unskilled, semiskilled, skilled, semiprofessional and professional. Home makers were considered as separate category for females. Similarly literacy status was considered as literates and no schooling. Descriptive statistics was used for representing the information as categories, counts, frequencies and percentages or proportions, in analysis chi square test was applied to find the association between the categorical variables and it was considered statistically significant if the p value was less than 0.05.

RESULTS

The study analysed 337 (43.8%) and 443 (56.2%) subjects of males and female diabetics respectively. The mean age of 770 study subjects was 56.5 ± 11.6 years. Table 1 shows more than 50% belonged to age group of 41-60 years and individuals in the age group of 20-40 years were 8%. More than 50% of the individuals were literate (67.4%) and it was almost equal among males and females. Most of female subjects were homemakers (70%). The semiskilled and skilled workers accounted for 40%, unemployed were more among males compared to females and less than 10% were professionals (3.5%) and semi-professionals (3.8%).

Table 2 shows one third of the individuals with history of diabetes were aged 61 years or above and duration of diabetes among them was more than 61 months. There was no significant difference between the mean duration of diabetes among males and females (p=0.3). The common co morbidities were cardiovascular diseases followed by endocrine (3.6%) and ophthalmic disorders (2.3%). The associated complications and co morbidities were more among females (24.2%) compared to males (17.5%). There was no statistical significant difference between the co-morbidities among males and females (p=0.7) but there was significant association to complications from diabetes mellitus (p=0.004). The family history of diabetes mellitus was present in 40% of the subjects and there were no statistical significant differences between males and females (p=0.5).

Figure 1 shows 71.4% of males and 58.2% of females did not have knowledge about the complications from diabetes. The different complications mentioned were eye diseases (33.8%), kidney diseases (32.8%) and infections (25.4%). Among 770 study subjects, 70.2% of females and 64.1% of males mentioned that diabetes causes serious complications. Two out of three subjects said consequences of diabetes are not serious. The different warning signs of onset of diabetes mentioned are causes weakness (57.1%), neuropathy (32.1%), clinical signs (23.5%) and few listed as infections and weight loss

(7.3%). Nearly half of the subjects had knowledge that lifestyle and genetic factors are causes for diabetes and 23.1% were not aware of the cause of diabetes.

Figure 2 shows that around 49.7% of the subjects said medical treatment is effective in controlling diabetes and

29.5% were not aware of medical effectiveness in treatment of diabetes. The perceived knowledge about the prevention was observed in 22.7% and 75.3% perceived that diabetes is not controllable.

Table 1: Socio demographic characteristics of study subjects.

Socio demographic characteristics		(N=337)	(N=443)	(N=770)	
		Male, N (%)	Female, N (%)	Total N (%)	
Age group in years	20-40	26 (7.7)	34 (8)	60 (8)	
	41-60	191 (56.7)	264 (61)	455 (59)	
	<u>></u> 61	120 (35.6)	135 (31)	255 (33)	
Literacy status	Literates	258 (49.7)	261 (50.3)	519 (67.4)	
	No schooling	79 (31.5)	172 (68.5)	251 (32.6)	
Occupations	Unemployed Homemaker Unskilled Semiskilled Skilled Semi-professional Professional	51 (15.1) - 13 (3.9) 128 (38.0) 107 (31.7) 12 (3.6) 26 (7.7)	7 (1.6) 310 (69.9) 26 (5.9) 45 (10.2) 27 (6.1) 17 (3.8) 1 (0.2)	58 (7.5) 310 (40.3) 39 (5.0) 173 (22.5) 134 (17.4) 29 (3.8) 27 (3.5)	

Table 2: Status of diabetes mellitus and co morbidities among male and female study participants.

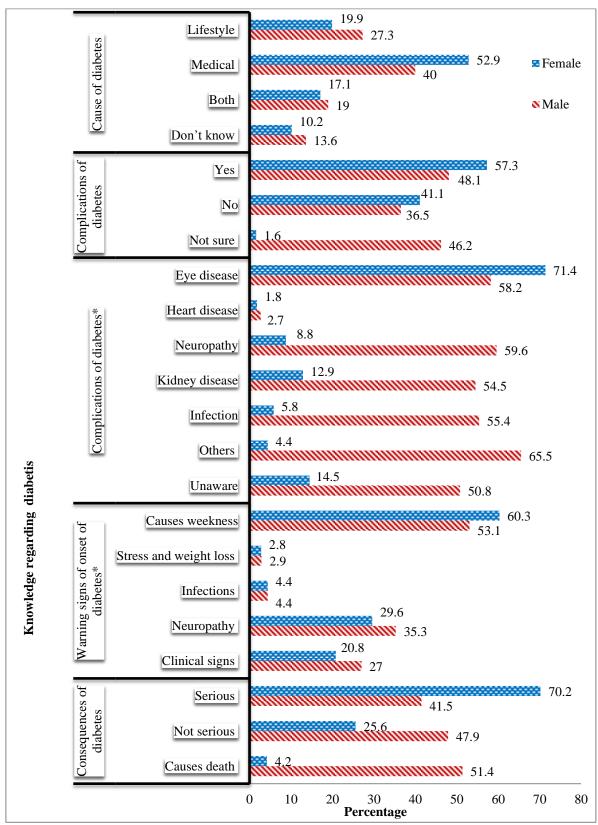
Parameters		(N=337) Male, N (%)	(N=443) Female, N (%)	(N=770) Total N (%)	P value*
Duration of diabetes (months)	≤12 13-24 25-36 37-48 49-60 ≥61	51 (15.1) 50 (14.8) 40 (11.9) 42 (12.5) 40 (11.9) 114 (33.8)	66 (14.9) 70 (15.8) 47 (10.6) 42 (9.5) 67 (15.1) 141 (31.8)	117 (15.2) 120 (15.6) 87 (11.3) 84 (10.9) 107 (13.9) 255 (33.1)	0.38
Associated co-morbidities and complications*	Cardiac Ophthalmic Endocrine Others None Don't know	114 (33.8) 4 (1.2) 1 (0.3) 16 (4.7) 8 (2.4) 209 (62.0)	124 (27.9) 14 (3.2) 27 (6.1) 21 (4.7) 10 (0.2) 273 (61.6)	238 (30.9) 18 (2.3) 28 (3.6) 37 (4.8) 482 (62.6) 11 (1.4)	0.004
Family history of diabetes	Yes No Don't know	135 (40.1) 189 (56.1) 13 (3.9)	172 (38.6) 236 (53.3) 25 (5.6)	307 (39.9) 425 (55.2) 38 (4.9)	0.47

^{*}Chi square test

Table 3 shows the knowledge about prevention, complications and consequences of diabetes were better among literates and subjects with family history of diabetes mellitus. However the knowledge on control of diabetes was similar irrespective of literacy status. The association between knowledge about prevention, complications, consequences of diabetes and literacy status of the study subjects (p<0.05) were statistically significant and no statistical significant association

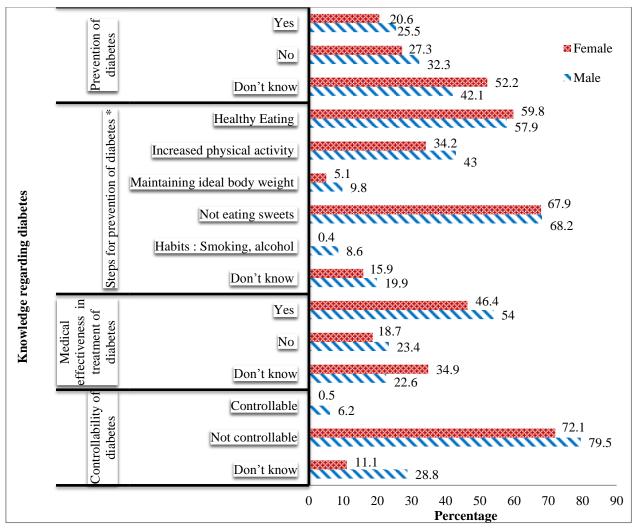
between knowledge about controllability of diabetes and literacy status (p=0.176).

The knowledge about control was more among subjects without family history. There were statistical significant associations between prevention, complications, consequences of diabetes and family history of diabetes (p=0.00) however it was not significant with family history and control of diabetes (p=0.06).



^{*} Multiple responses are included

Figure 1: Distribution of study subjects according to knowledge about complications, consequences, warning signs and causes of diabetes mellitus.



^{*}Multiple responses are included

Figure 2: Distribution of study subjects according to knowledge about prevention, steps for prevention, medical effectiveness and controllability of diabetes mellitus

Table 3: Association between prevention, complications, consequences and curability of diabetes and literacy and family history of diabetes.

Knowledge		Liter	acy status	Fami	Family history of diabetes			
		Literate	No schooling	Yes	No	Don't know		
Prevention	Yes	144 (27.7)	31 (12.4)	88 (28.7)	87 (20.5)	0		
of diabetes	No	151 (29.3)	75 (29.9)	88 (28.7)	127 (29.9)	12 (31.6)		
	Don't know	223 (43.0)	142 (57.8)	131 (42.7)	211 (49.6)	26 (68.4)		
Complicatio	Yes	215 (41.4)	50 (19.9)	134 (43.6)	130 (30.6)	1 (2.6)		
ns of	No	296 (57.0)	196 (78.1)	167 (54.4)	290 (68.2)	35 (92.1)		
diabetes	Not sure	8 (1.5)	5 (2.0)	6 (2.0)	5 (1.2)	2 (5.3)		
Consequenc	Serious	160 (30.8)	53 (21.1)	89 (29.0)	123 (28.9)	1 (2.6)		
es of	Not serious	340 (65.5)	180 (71.7)	196 (63.8)	287 (67.5)	37 (97.4)		
diabetes	Causes death	19 (3.7)	18 (7.2)	22 (7.2)	15 (3.5)	0		
Controllabil	Completely	28 (7.9)	17 (8.3)	16 (5.2)	29 (6.8)	0		
ity of	controllable							
diabetes	Not	242 (68.6)	126 (61.5)	245 (79.8)	305 (71.8)	30 (78.9)		
	controllable							
	Don't know	83 (23.5)	31 (30.2)	46 (15.0)	91 (21.4)	8 (21.1)		

Numbers in parenthesis indicates percentage.

Table 4: Association between knowledge about prevention, complications, consequences and curability of diabetes among study subjects.

Knowledge about diabetes		Duration of diabetes in months						
		<u><</u> 12	13-24	25-36	37-48	49-60	<u>></u> 61	
Prevention of diabetes	Yes	26 (22.2)	27 (22.5)	20 (23.0)	18 (21.4)	26 (24.3)	58 (22.7)	
	No	37 (31.6)	37 (30.8)	30 (34.5)	24 (28.6)	23 (21.5)	76 (29.8)	
	Don't know	54 (46.2)	56 (46.7)	37 (42.5)	41 (50.0)	58 (54.2)	120 (47.5)	
Complications of diabetes	Yes	33 (28.2)	47 (39.2)	36 (41.4)	32 (38.1)	35 (32.7)	82 (32.2)	
	No	83 (70.9)	70 (58.3)	50 (57.5)	50 (59.5)	71 (66.4)	168 (65.9)	
	Not sure	1 (0.9)	3 (2.5)	1 (1.1)	2 (2.4)	1 (0.9)	5 (2.0)	
Consequences of diabetes	Serious	33 (28.2)	29 (24.2)	29 (33.3)	19 (22.6)	22 (20.6)	81 (31.8)	
	Not serious	82 (70.1)	84 (70.0)	53 (60.9)	61 (72.6)	77 (72.0)	163 (63.9)	
	Causes death	2 (1.7)	7 (5.8)	5 (5.7)	4 (4.8)	8 (7.5)	11 (4.3)	
Controllability of diabetes	Completely controllable Not controllable Don't know	10 (8.5) 79 (67.5) 28 (23.9)	11 (9.2) 85 (70.8) 24 (20.0)	6 (6.9) 66 (75.9) 15 (17.2)	2 (2.4) 71 (84.5) 11 (13.1)	4 (3.7) 85 (79.4) 18 (16.8)	12 (4.7) 194 (76.1) 49 (19.2)	

Numbers in parenthesis indicates percentage.

Table 4 shows there were differences in knowledge about prevention of diabetes among subjects with duration of diabetes, knowledge on complications was more among individuals with duration of diabetes of 13-24 and 25-36 months (39.2% and 41.4%), about consequences among 25-36 months and on control among less than or equal to 12 and 13-24 months of duration of diabetes (9.2% and 8.5% respectively). There were no statistical significant associations between prevention, complications, consequences, control of diabetes and duration of diabetes (p>0.05).

DISCUSSION

The impact of any preventive or control strategies on diabetes depends on the presence of awareness of the problem in their society. The mere presence of knowledge will not determine the perception of the extent of the problem. This needs to be analysed with the background variables present among subjects in the same community. There is increase in number of diabetes mellitus in India and prevalence is higher in urban areas compared to rural areas. The knowledge and perception also likely to change with time and by observing the affected people. This study analysed the knowledge and perception about diabetes mellitus on warning signs, complications, consequences, control and prevention aspects.

The randomly selected subjects were in the age group of 26 to 96 years. The maximum numbers of subjects were in the age group of 41–60 years (59%) in this study. Mean age was 56.5±11.6 years and the mean age for males and females was 57.2±11.9 and 56.2±11.4 years. Literacy status was almost equal among males and females. Among females, 40.3% were homemakers. The pattern is almost similar to a study done in rural area of Dakshinakannada district, Karnataka.⁷

Diabetes mellitus and co morbidities

In our study 66.9% were having diabetes for 1-5 years duration and 33% of them were diabetic of more than 6 years as shown in Table 2. The mean duration of diabetes was 62.3±52.3 years and the range of duration was 1 month to 360 months (males 64.7±52.8 and females 60.1±51.8). The median duration was 48 months. There was no significant difference between mean duration of diabetes between male and female. Parameters of diabetes like duration, associated co morbidities and complications were assessed for their association with sex. Associated co morbidities and complications was statistically significant with sex (p=0.004) but duration of diabetes and family history of diabetes was not significant with sex. The co morbidity prevalence was 41.6% and common co morbidity was cardiovascular related diseases (30.9%). The findings of this study remain the same as other studies conducted both in rural and urban areas.8,9

Knowledge about warning signs, cause, complications, consequences of diabetes mellitus

The subjects listed out the neurological and musculoskeletal problems as warning sign of diabetes. Most common warning signs of onset of diabetes mentioned were neuropathy (32.1%) and other clinical signs (23.5%) as shown in Figure 1. The perception about consequences of diabetes as serious (27.7%) and 4.8% answered diabetes causes death. Around 62.1% knew about complications of diabetes and most common complications perceived were eye diseases, kidney disorders and infections. In the present study 47.2% perceived both lifestyle and hereditary as cause of Diabetes Mellitus. The study done by ICMR reports 72.7% knew about complications of diabetes and

common complications mentioned were eye diseases (73.5%) and neuropathy (26.8%). 10

Knowledge about prevention, steps for prevention, medical effectiveness and controllability of diabetes mellitus

Knowledge regarding diabetes is important to take measures for its prevention of onset, complication of diabetes and compliance to treatment. Lack of awareness about diabetes and adherence to treatment is the main cause for rising burden of diabetes in India. In our study more than 60% of the subjects were literate and 22.7% perceived diabetes is preventable. Most common strategies mentioned for prevention were healthy eating (59%) and physical activity (38.1%), others include maintenance of body weight, avoiding habits like smoking and alcohol (11.1%) as shown in Figure 2. Around 23.1% were not aware about cause of Diabetes Mellitus and 47.2% mentioned diabetes is due to medical cause or hereditary and lifestyle. Among 770 subjects 62.1% were aware of at least one complications of diabetes, 27.7% said diabetes has serious complications and 49.7% said medical treatment is effective in treatment of diabetes whereas 29.5% were not aware of effectiveness of treatment as shown in Figure 2. Among different KAP studies done about diabetes showed poor knowledge about diabetes, its consequences and complications. Knowledge was poor both in urban and rural area, which is similar to findings of our study. 11,12

Association between prevention, complications, consequences and curability of diabetes with literacy, family history and duration of diabetes

Literacy status, duration of diabetic state is known to influence knowledge about diabetes. But in present study knowledge about prevention of diabetes (prevention, complications and consequences of diabetes) was poor despite of good literacy status. Though the knowledge was higher among literates but perception was low (less than 50%). Knowledge of diabetes was statistically significant with literacy status and family history of diabetes but no association was seen between knowledge about controllability of diabetes and literacy and family history of diabetes as shown in Table 3. There was no significant association between knowledge about diabetes and duration of diabetes as shown in Table 3 and 4.

A hospital based study in Delhi and in urban area of Gujarat showed statistical significant association between literacy status and knowledge about diabetes which is similar to findings in our study but there was no association between knowledge and duration of diabetic state. ^{12,13}

CONCLUSION

The knowledge on warning signs of onset, prevention and controllability of diabetes was inadequate among diabetic

subjects. They perceived that 30% for serious complications and no effective treatment for control of diabetes in 50% of study subjects among study subjects.

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