



Assessment of Perception of Myths and Awareness about Diabetes Among Type-2 Diabetes Subjects in Selected Hospitals in Mysuru City

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Abstract

Myths and misconceptions are one of the barriers which impedes the diabetics from presenting their problem to a healthcare professionals. Therefore, health education plays a pivotal role in increasing the awareness about diabetes and its complications, thereby reducing the number of deaths due to micro- and macro-vascular complications of diabetes. A short-term hospital based study was carried out to assess the awareness among 30 diabetics between 30 and 60 years, attending a government hospital and a corporate-multispecialty hospital in the city. A questionnaire was developed to collect information on baseline characteristics, anthropometric measurements and biochemical parameters of the subjects and to assess their perception of myths and awareness about the disease, its complications and management and the results were evaluated according to the set local norms. Results of the study revealed that majority were obese irrespective of the gender. Men showed a poor glycaemic control than women though on medication, regardless of hospital they attended. Most common myths prevalent among the study group were- "Diabetics should eat special foods only like Ragi (*Eleusine coracana*) and millets from the cereal group", "Diabetics should never eat sweets and chocolates", "All bitter tasting foods reduce blood sugar level" and "Eating too much sugar causes diabetes". The subjects ≤ 50 yrs had better awareness than ≥ 51 yrs. However, there was no significant association as against to the level of education. Of the study group, 63.4% had an average awareness about diabetes, followed by 23.3% subjects with fair knowledge and only a smaller percentage had good awareness about diabetes. In conclusion, this study reflects the prevalence of myths and misconceptions in a significant percentage of subjects, which can hinder them from seeking timely medical intervention from physicians, dieticians/nutritionists and thereby prevent diabetes related complications.

Keywords: Myths; Misconception; Awareness; Diabetic complications; Statistical Associations; Mysuru

Abbreviations

FBS: Fasting Blood Sugar; PPBS: Post-Prandial Blood Sugar; HbA1c: Glycated haemoglobin; BMI: Body Mass Index; CH: Corporate Hospital; GH: Government Hospital; SSLC- Secondary School Leaving Certificate (10th class); PUC- Pre-University Course (10+2 class); T2DM- Type 2 Diabetes Mellitus; OHA- Oral Hypoglycaemic Agents.

Introduction

Type 2 diabetes mellitus, characterised by hyperglycaemia and high glycated haemoglobin, is becoming an epidemic and endemic problem adding social and economic burden on the individual and the country and is one of the ten causes of death in India, both at national and state level. India stands second in the world after China with 8.8% diabetics with nearly 1 million death reported in 2017 [1]. In 2013, the prevalence of diabetes in the urban area of Karnataka was 11.1% while that of the rural area was 5.6%. [2].

The prevalence of complications and untreated complications leading to death is much higher because of poorer control of diabetes, lack of awareness among the general public and diabetics and lack of access to the health-care facility [3]. Myths and misconceptions are one of the important reason for lack of awareness among diabetics. CURES-9 study conducted on a large representative sample of Chennai city in Southern India, reflected the poor knowledge and awareness about diabetes in urban area [4]. A hospital-based KAP study on diabetics in Bijapur, Karnataka reported that a majority of the respondents had average knowledge, which was 2.4 folds greater than the respondents with good knowledge and almost 4 folds greater than the respondents with poor knowledge [5]. A community based study on perceived knowledge of diabetes among diabetics in Bengaluru city by Shwetha., et al. reported that 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 dia-

betes [6]. Therefore, the medical management of diabetes should include nutritional and health education as it plays a role in-terms of self-care practices. The result of a casual observation among few of the diabetics residing in Mysuru city encouraged in carrying out the present study to assess the level of perception of myths and awareness among type-2 diabetics attending a corporate hospital and a government hospital in Mysuru city.

Methodology

This study was a hospital-based, cross-sectional study comprising 30 subjects in the age group of 30 - 60 years. Subjects, either with known cases or newly-diagnosed cases of type-2 diabetes mellitus, attending the out-patient department of a government hospital (n = 15) and a corporate hospital (n = 15) in Mysuru city, Karnataka, India, were recruited, irrespective of gender applying the non-probability, quota sampling technique. After obtaining verbal consent, a pre-tested, structured questionnaire was employed to elicit data on the aspects, namely baseline characteristics- demographic profile and socio-economic status, anthropometric measurements- weight and height (measured according to the WHO guidelines and BMI was calculated dividing weight by height squared-kg/m²), biochemical parameters- FBS, PPBS and HbA1c and medical history.

Assessment of perception of myths included 20 close-ended questions with yes or no options, while assessment of the level of awareness comprised 10 close-ended questions with four options focusing on disease, diet, medication and complication. In total, the questionnaire contained 30 questions. Each correct answer was scored as 1 and incorrect answer as 0, regardless of the sections of the questionnaire. Total scores were calculated and the percentage was found. Evaluation of the second section of the questionnaire was carried out according to local norms set, considering the mean and standard deviation of the scores. For a maximum of 10 scores, if total marks obtained is 0 to 2, 3 to 6 and 7 to 10, then it is termed as fair, average and good, respectively. The data collected were entered in Microsoft Office Excel 2013. Mean with the respective standard deviation and percentages were used wherever necessary. SPSS version 16.0 was used for statistical analysis (T-test, Chi-square and ANOVA). A p-value of less than 0.05 was considered significant (*) and p-value less than 0.01 as highly significant (**). Ethical clearance was obtained from the Institutional Human Ethics Committee, University of Mysore prior to the initiation of the study.

Results and Discussion

The baseline characteristics of the subjects are represented in table 1. Majority (56.7%) of the subjects irrespective of gender, belonged to the age group of 51 -60 years. 70% of the subjects hailed from the urban area of Mysuru, 60% of them lived as nuclear families and almost all (96.7%) were married. 53.3% had education

level of SSLC and below while 46.7% had PUC and above. Among the literates, male subjects were better qualified compared to females irrespective of the hospitals they attended. 68.8% of women were home-makers and 63.3% of men were working and their occupation ranging from being daily wagers to professionals, with a majority receiving a monthly income of 15,000Rs to 25,000Rs in both the groups.

Study characteristics	Frequency (%)		
	Male (n = 14)	Female (n = 16)	Total (n = 30)
Sample			
Corporate hospital	7 (50.0)	8 (50.0)	15 (50.0)
Government hospital	7 (50.0)	8 (50.0)	15 (50.0)
Age in years			
50 years and below	6 (42.9)	7 (43.8)	13 (43.3)
51 years and above	8 (57.1)	9 (56.3)	17 (56.7)
Area of residence			
Rural	4 (28.6)	5 (31.3)	9 (30.0)
Urban	10 (71.4)	11 (68.8)	21 (70.0)
Marital Status			
Married	0 (0)	29 (96.7)	29 (96.7)
Unmarried	1 (3.3)	0 (0)	1 (3.3)
Family type			
Nuclear	9 (64.3)	9 (56.2)	18 (60.0)
Non-nuclear	5 (35.7)	7 (43.8)	12 (40.0)
Socio-Economic Status			
Education			
SSLC and below	5 (35.7)	11 (68.8)	16 (53.3)
PUC and above	9 (64.3)	5 (31.3)	14 (46.7)
Occupation			
Workers	14 (100.0)	5 (31.3)	19 (63.3)
Non-workers	0 (0)	11 (68.8)	11 (36.7)
Family Income			
<15000	4 (28.6)	5 (31.3)	9 (30.0)
15000-25000	7 (21.4)	6 (37.5)	13 (43.3)
>25000	3 (50.0)	5 (31.3)	8 (26.7)

Table 1: Baseline characteristics of the subjects.

Anthropometric measurements (Table 2) did not show any significant difference in terms of mean age, height and weight between the two groups (C.H and G.H). However, the mean BMI of C.H. men was significantly (p 0.030) higher than G.H. men, while that of women were comparable. Obesity in T2DM patients is very common phenomenon and often termed as "diabesity" [7]. Likewise, in the present study majority (73.4%) of the subjects were either overweight or obese. Gender specific age-group wise distribution of BMI (Asia-Pacific Classification of BMI) of subjects irrespective

of the hospitals they attended (Figure 1 and 2) revealed that 6.3% and 18.8% women between 51-60 years were grade III obese and grade II obese, respectively. An equal distribution of 7.1% of men between the age groups 31 - 40 years and 51 - 60 years were of grade II obese. In both, men and women a higher percentage

(21.4% and 18.8%, respectively) of subjects were observed under obesity grade I. It was noteworthy that the prevalence of obesity (70%) is almost 2.5 folds greater than that of the prevalence reported by Rao CR., *et al.* [8] in their study carried out in coastal Karnataka.

Parameters	Male n = 7		p value	Female n = 8		p value	Male n = 14	Female n = 16
	C.H.	G.H.		C.H.	G.H.			
Age (yrs)	47 ± 9.95	49 ± 8.67	0.695	51 ± 8.75	51 ± 4.49	0.944	48 ± 9.02	51 ± 6.72
Height (cm)	166 ± 8.43	165 ± 6.43	0.834	157 ± 7.35	156 ± 7.30	0.713	166 ± 7.21	156 ± 7.21
Weight (kg)	79 ± 13.15	67 ± 12.45	0.097	67 ± 9.71	68 ± 16.19	0.870	73 ± 13.86	67 ± 12.91
BMI (kg/m ²)	29 ± 2.52	24 ± 3.65	0.030*	27 ± 5.55	28 ± 7.18	0.834	36 ± 3.70	28 ± 6.21

Table 2: Age and anthropometric measurements of C.H. and G.H. subjects.

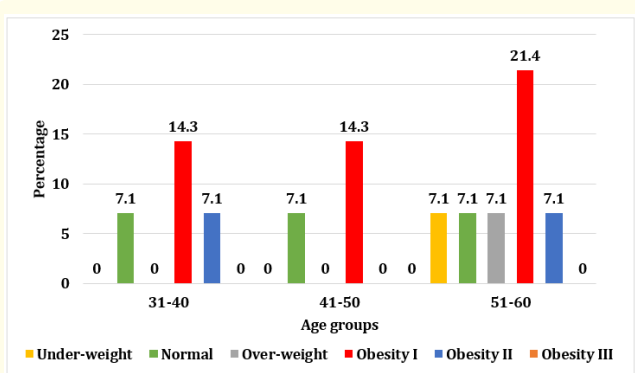


Figure 1: Age-group-wise distribution of men based on BMI.

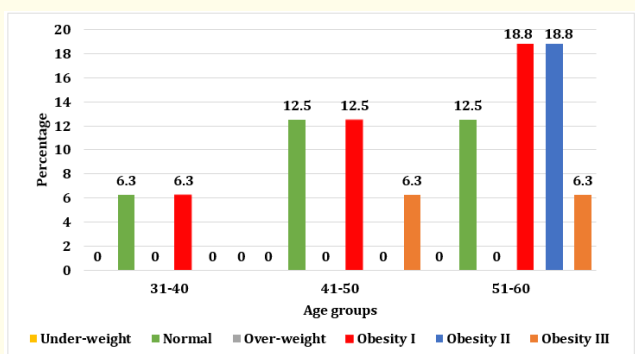


Figure 2: Age-group-wise distribution of women based on BMI.

As per RSSDI/WHO 2015 cut-offs, the mean FBS and PPBS of G.H. men (113 ± 22.23 mg/dL and 166 ± 37.03 mg/dL) was lesser than the reference value (FBS ≥126 mg/dL; PPBS ≥200 mg/dL) and also than the C.H. men (172 ± 62.69 mg/dL and 259 ± 72.80 mg/dL) and there existed a significant difference between the FBS and PPBS of both C.H. and G.H. groups (p =.036 and p = .011, respectively). Statistical significance was also noted between C.H. and G.H. groups of women but only concerning PPBS (C.H. 166 ± 27.54 mg/dL, G.H. 229 ± 53.47 mg/dL, p = .011). The means of FBS, PPBS and HbA_{1c} (133 ± 41.47, 204 ± 62.4 and 8 ± 1.20), irrespec-

tive of gender was lesser than the means of diabetic patients belonging to a study carried out by Venkatesh SK., *et al.* [9] (156 ± 67, 229 ± 96 and 8.5 ± 2.12, respectively). Diabetes biomarker HbA_{1c} showed that majority of C.H. women (71.4%) had a value ≤ 7.0% indicating a better glycaemic control as compared to G.H. women (28.6%). Among men, poor glycaemic control was observed in both, C.H. (100%) and G.H. (71.4%) groups with a value >7.0%. A majority of the subjects (67.9%) had a higher percentage of glycated haemoglobin (%) with a mean of 8.8 ± 0.82, which may be because of poor dietary habits and lack of awareness. Irrespective of the gender, 73.3% of the subjects had a family history of type 2 diabetes mellitus, followed by 46.7% with hypertension and 10% with dyslipidaemia and cardiovascular diseases, each.

Table 3 shows the correct responses of the subjects about perception of myths and awareness about diabetes. The responses of the subjects concerning perception of myths and awareness were categorised according to- hospital-wise, age-wise, level of education, type of family and income for analysing associations. Statistically significant results are mentioned in table 4. Association of responses with hospital groups revealed that significantly higher percentage (93.3%) of C.H. subjects believed that 'long term uncontrolled diabetes leads to complications' than G.H. group. It was noted that majority of subjects from a C.H. and G.H. groups (73.3% and 100%, respectively) believed that only special foods like ragi (*Eleusine coracora*) and millets are to be consumed for their condition but the prevalence of myth- 'herbal supplements can cure diabetes' was significantly higher in G.H. group than C.H. group.

Comparison of responses with age group showed that significant association was seen higher in 50 years and below-group than 51 years and above with respect to 'overweight and obesity a risk factor for diabetes mellitus, uncontrolled diabetes leads to complications, long-term uncontrolled diabetes mellitus can cause loss of vision and delayed wound healing is one of the symptoms of uncontrolled diabetes'. Myths on diet such as 'diabetics should not eat fruits and rice' was higher among 51 years and above group than their counterpart.

Questions	Correct answers Frequency (%)
Overweight and obesity is a risk factor for T2DM	12 (40.0)
Diabetics are allowed to eat only small amount of starchy foods such as, rice, bread, potatoes	23 (76.7)
Uncontrolled diabetes leads to complications	25 (83.3)
Long term uncontrolled diabetes can cause blindness	23 (76.7)
T2DM is a disorder in which pancreas does not produce enough insulin and the body does not use insulin properly	12 (40.0)
Delayed wound healing is one of the symptoms of uncontrolled diabetes	17 (56.7)
Eating too much sugar causes diabetes	5 (16.7)
Diabetes is not that serious of a disease and does not require management	14 (46.7)
Diabetics should eat special foods only like ragi and millets in cereals	4 (13.3)
Diabetics should not eat sweets and chocolates	4 (13.3)
Diabetes is contagious	28 (93.3)
Diabetics should not eat fruits	11 (36.7)
Once on drugs and/or insulin diabetics can eat anything and in any quantity	16 (53.3)
Diet/lifestyle changes is not required in diabetes	17 (56.7)
All bitter tasting foods reduce blood sugar level	4 (13.3)
Diabetics should not eat rice	15 (50.0)
Diabetes medication is same to all diabetics	14 (46.7)
Herbal supplement can cure diabetes	19 (63.3)
Diabetic cannot live happy and healthy life	24 (80.0)
Doctor is the only one responsible for diabetes care	14 (46.7)

Table 3: Correct responses of the subjects for the awareness about diabetes questions.

It is generally believed that the duration of diabetes and literacy rate of the participants have some influence on the knowledge regarding the disease condition. In this study, both these criteria did not have any favourable effect on the perception of myths and awareness by the respondents, which is in contrast to the study by Dinesh PV, *et al.* [10]. The awareness about diabetes was found to be similar among both urban and rural subjects, however 88.9% from rural and 47.6% from urban area did not know that T2DM is a disorder of pancreas or insufficiency of insulin.

Myths concerning food choices such as ‘diabetics should not eat fruits/rice and once on drugs and/or insulin diabetics can consume anything and in any quantity and diabetes medication (OHA/insulin) are same to all’, when compared to family type showed

that disagreement was significantly higher in nuclear family than non-nuclear family type.

Prevalence of myths such as diabetics should not eat fruits, once on drugs and/or insulin diabetics can eat anything and in any quantity, and diabetes medication is same to all diabetics was significantly higher in families with income of >Rs25,000/month than families with monthly income of Rs15,000 to Rs25,000, followed by <Rs15,000 income.

A study in tertiary care hospital in Delhi carried out by Rai, *et al.* [11] stated that prevalence was greater among women, which can be attributed to the fact that they are usually less educated than men in India. But, this is not in agreement with the finding of the present study, that is, no significant difference was noted with respect to gender and myths and/ or awareness. Belief in bitter substance in treating diabetes was found to be more (86.7%) in the present study group, than study group of Dinesh PV, *et al.* (71.75%) [10]. But belief in “high sugar intake causes diabetes” was higher among the participants of study carried out by Rai, *et al.* [11] (92%), than this study group (83.3%) and a similar trend was observed with regard to “herbal medications can cure diabetes” between the same study groups.

The knowledge about the disease, symptoms, complications and management was also tested and it was found that 63.4% had an average knowledge and 13.3% had good knowledge and 53.3% considered diabetes as a serious disorder and require management but only 33.3% were aware of the management strategies which includes, both dietary and lifestyle modifications to maintain ideal body weight along with good glycaemic control.

The results of health awareness questions were categorized into three sections namely, about the disease (AD), about the diet (ADi) and about the medication, complications and management (MCM) are presented in table 6. A significant difference was observed between the hospital-groups with respect to the responses towards knowledge about the condition of the subjects (p = 0.014), with 26.7% of C.H. subjects securing good score than G.H. subjects (0%). The benefits of physical activity on- blood sugar, blood pressure, cholesterol control and weight loss was known to only 23.3% of the study population. This could be one of the reasons why majority of the subjects were obese with poor glycaemic control.

The results so obtained cannot be generalised as the sample size considered is too small, the anthropometric and biochemical parameters available were limited, the questionnaire used in eliciting information about myths is close-ended which may be guessed sometimes.

Questions	Hospital					χ^2 (df = 1)	p value
	Corporate		Government				
	n	%	n	%			
Long-term uncontrolled diabetes leads to complications	Yes	14	93.3	9	60.0	4.658	0.031*
	No	1	6.7	6	40.0		
Diabetics should eat special foods only like ragi and millets in cereals	Yes	11	73.3	15	100	4.615	0.032*
	No	4	26.7	0	0		
Herbal supplement can cure diabetes	Yes	1	6.7	10	66.7	11.627	0.001*
	No	14	93.3	5	33.3		
Age group						χ^2 (df = 1)	p value
50 years and below		51 years and above					
n	%	n	%				
Overweight and obesity is a risk factor for type 2 diabetes	Yes	8	61.5	4	23.5	4.434	0.035*
	No	5	38.5	13	76.5		
Uncontrolled diabetes leads to complications	Yes	13	100	12	70.6	4.588	0.032*
	No	0	0	5	29.4		
Long-term uncontrolled diabetes can cause blindness	Yes	13	100	10	58.8	6.982	0.008*
	No	0	0	7	41.2		
Delayed wound healing is one of the symptoms of uncontrolled diabetes	Yes	10	76.9	7	41.2	3.833	0.05
	No	3	23.1	10	58.8		
Diabetics should not eat fruits	Yes	5	38.5	14	82.4	6.111	0.013*
	No	8	61.5	3	17.6		
Diabetics should not eat rice	Yes	3	23.1	12	70.6	6.652	0.010*
	No	10	76.9	5	29.4		
Education						χ^2 (df = 1)	p value
SSLC and Below		PUC and Above					
n	%	n	%				
Long term uncontrolled diabetes can cause blindness	Yes	10	62.5	13	92.9	3.846	0.050*
	No	6	37.5	7	7.1		
Area						χ^2 (df = 1)	p value
Rural		Urban					
n	%	n	%				
Type 2 diabetes is a disorder in which pancreas does not produce enough insulin and the body does not use insulin properly	Yes	1	11.1	11	52.4	4.471	0.034*
	No	8	88.9	10	47.6		
Family type						χ^2 (df = 1)	Sig. value
Nuclear		Non-Nuclear					
n	%	n	%				
Type 2 diabetes is a disorder in which pancreas does not produce enough insulin and the body does not use insulin properly	Yes	11	61.1	1	8.3	8.356	0.004*
	No	7	38.9	11	91.7		
Diabetics should not eat fruits	Yes	8	44.4	11	91.7	6.914	0.009*
	No	10	55.6	1	8.3		
Once on drugs/insulin diabetics can eat anything and in any quantity	Yes	5	27.8	9	75	6.451	0.011*
	No	13	72.2	3	25		
Diabetics should not eat rice	Yes	6	33.3	9	75	5.000	0.025*
	No	12	66.7	3	25		
Diabetic medication is same to all diabetics	Yes	6	33.3	10	83.3	7.232	0.007*
	No	12	66.7	2	16.7		

Table 4: Statistical associations between selected characteristics and responses of the subjects.

Questions	Income group							χ^2 (df = 2)	Sig. value
	<15,000		15,000-25,000		>25,000				
	n	%	n	%	n	%			
Diabetics should not eat fruits	Yes	7	77.8	10	76.9	2	25	6.905	0.032*
	No	2	22.2	3	23.1	6	75		
Once on drugs and/or insulin diabetics can eat anything and in any quantity	Yes	6	66.7	8	61.5	0	0	9.602	0.008*
	No	3	33.3	5	38.5	8	100		
Diabetes medication is same to all diabetics	Yes	6	66.7	9	69.2	1	12.5	7.322	0.026*
	No	3	33.3	4	30.8	7	87.5		

Table 5: Statistical association between family income per month and responses of the subjects.

Parameters		Score	AD (Max- 3)	ADi (Max- 1)	MCM (Max- 6)	Total (Max- 10)
C.H. n = 15	Good	3	4 (26.7)	7 (46.6)	3 (20.0)	3 (20.0)
	Average	1-2	7 (46.6)	0 (0)	2 (13.3)	11 (73.3)
	Fair	0	4 (26.7)	8 (53.3)	10 (66.7)	1 (6.7)
G.H. n = 15	Good	1	0 (0)	2 (13.3)	1 (6.7)	1 (6.7)
	Average	-	9 (60.0)	3 (20.0)	6 (40.0)	8 (53.3)
	Fair	0	6 (40.0)	10 (66.7)	8 (53.3)	6 (40.0)
p value		-	0.014*	0.130	0.635	0.135
Total subjects n = 30	Good	≥ 7	4 (13.3)	10 (33.3)	5 (16.7)	4 (13.3)
	Average	3 to 6	16 (53.4)	0 (0)	20 (66.7)	19 (63.4)
	Fair	0 to 2	10 (33.3)	20 (66.7)	5 (16.7)	7 (23.3)

Table 6: Results of condition specific questions on disease, diet and medication, complication and management.

Conclusion

This study reflects the prevalence of myths and misconceptions about diabetes in significant percentage and poor knowledge about the disease condition, which can hinder seeking proper treatment by diabetics and thereby increasing diabetes related complications. The most prevalent myths were about diet which included- “diabetics should not eat sweets and chocolates, all bitter tasting foods reduce blood sugar level, diabetes should only eat ragi (*Eleusine coracona*) and millets, and eating too much sugar causes diabetes”, which constitutes the major finding of the study. It is essential to educate the people about T2DM and its treatment/management options as this will play a pivotal role in control and prevention of diabetes in the country, thereby reducing the morbidity, mortality and financial burden on the country.

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