RESEARCH ARTICLE

Assessment of Knowledge and Dietary Misconceptions among Diabetic Patients

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Abstract

Background: Diabetes mellitus (DM) is a major health problem globally and so are misconceptions. Misconceptions can lead to poor glycemic control among diabetic patients and hence may results in complications and therefore increased incidence of morbidity and mortality.

Objective: Assessment of knowledge and dietary misconceptions among diabetic patients.

Methodology: A cross-sectional prospective study was conducted among diabetic patients for a period of 6 months, using a validated questionnaire. Patients were contacted while attending to a health care facility in Quetta, Pakistan. A self-administered questionnaire was introduced among participants. Assistance was provided to those who could not read or understand the questionnaire. The questionnaire was designed in English and then translated in to Urdu by a language expert. The data were coded and entered to statistical package for social sciences (SPSS) version 20. The responses to the questionnaire were analyzed by performing descriptive and inferential statistics.

Results: Study showed that almost 83% of diabetic subjects believed that "in diabetes sugar cannot be used at any cost", while 68% believed that special diabetic food is used in diabetes; almost 66% patients admitted that they can suffer from other diseases and infections due to diabetes. Misconceptions were more common among uneducated and low income people.

Conclusion: The prevalence of misconceptions about Diabetes is high among uneducated and low income people.

Key words: Diabetes Mellitus, Knowledge, Misconceptions, Myths, Treatment, Pakistan.

INTRODUCTION

Diabetes mellitus is a common metabolic disorder with high prevalence worldwide ranging from as low as <1% to >50%. The WHO estimates that more than 180 million people worldwide have diabetes and this number is likely to more than double by 2030.[1] According to the American Diabetes Association DM should considered as a group of metabolic disorders characterized by a hyperglycemic state, as a result of chronic insulin resistance, which leads to pancreatic β cell dysfunction and subsequently a massive failure on insulin secretion. DM chronic hyperglycemia has been associated with long-term target organ damage, dysfunction, and collapse especially among ophthalmologic, renal, neurologic and cardiovascular system.[2] Even then, the only few people have the right information about the disease. No study has been conducted in recent years in Quetta to assess the prevailing misconceptions and knowledge about diabetes among diabetic patients.

Misconceptions are based on popular beliefs or stories that have become associated with a person, community, or occurrence, especially when considered to illustrate a cultural ideal.[3] These false collective beliefs become part of cultural identity and used to justify a social behavior. They have a strong influence in the life of individuals and their way of living including seeking treatment during illness. Therefore, understanding the myths and misconceptions

about diabetes mellitus is important in providing better care and health education to both patients and healthy individuals.

Diet has been the mainstay of therapy in diabetes for centuries. A number of factors influence glycemic response to food, including the amount of carbohydrate,[4] type of sugar (glucose, fructose, sucrose and lactose),[5] nature of starch (amylase, amylopectin and resistant starch),[6] cooking and food processing (degree of starch gelatinization, particle size, cellular form),[7] and food structure, as well as other food components (fat and natural substances that slow digestion-lectins, phytates, tannins, starch-protein and starch-lipid combinations).[8]

It is widely believed that people with diabetes should eat special diabetic foods.[9,10] In fact the recent recommended healthy diet for people with diabetes is the same as that recommended for people without the condition. Many myths and misconceptions regarding diet of diabetic patients are deeply rooted in this part of the world. Pakistani population consists of people from different cultural background and there is very strong influence of various myths, especially about the diet on health seeking behavior. It is widely believed in this part of the world that underground vegetables are dangerous for diabetes while bitter vegetables are good for health and reduce blood sugar level. Similarly they strongly believe that fruit and rice are prohibited. These myths in the society have become a major hurdle towards the effective management of diabetes. Understanding the myths and misconceptions are important in providing excellent care to the patients and healthy individuals as well.[11]

There has been a little research to understand these misconceptions, and there is scarce data related to this subject. The purpose of this study was to find out various myths regarding diet of diabetics so that we would be able to combat the major hurdle for proper treatment and effective control of diabetes.

METHODOLOGY

Study design, site and participants

A cross-sectional study was conducted for a period of 6 months (from April-September 2014) in BMCH (Bolan Medical Complex Hospital) of Quetta (which is one of the tertiary hospital of Quetta), Al-Khidmat Pharmacy (which is one of the private health centers and is running through the political party i.e. Jamat-e-Islami); and different diagnostic laboratories of Quetta city. All the participants were briefed

about the objectives and outcomes of research, those who agreed to sign the consent form were enrolled in this study. A total of 353 diabetic patients were registered in these health care settings during this time period and among them 320 were agreed to participate in the study. The generated sample size was adequately powered to estimate the process parameters.

Study instrument

The data was collected through the self-administered questionnaire. All questions were close-ended, and were prepared in English language and then translated in Urdu language with the help of language experts along with co-investigators from the field of pharmacy by using the standard translating procedures. Questionnaire was finalized after a thorough discussion, and subsequently were distributed to the participants for their response.

The questionnaire was divided in to four parts. The first part comprised of demographic information of the respondents. Second part assesses the knowledge and myths among diabetic patients regarding diet in which "Yes or No" option were given against each set of question. Third portion comprised of disease characteristics, and the last fourth part consist on the multiple options of source of information. The study instrument assessed the knowledge of diabetic patients by asking the questions about the diet.

Data analysis

The collected data was reviewed, coded, verified and statistically analyzed by using the SPSS version 20. Descriptive analysis was conducted in which categorical variables were expressed frequency and percentage. Continuous variables were expressed in mean ± SDand mean comparison. Inferential statistics (Mann-Whitney U test and Kruskal Wallis) were used to assess the significance among study variables. And p-value less than 0.05 considered statistically significant.

Ethical Approval

The study approved by Institutional Ethics Committee, Faculty of Pharmacy, University of Balochistan. All the patients were informed by the consent form that their participation is voluntary and their name and knowledge will be kept anonymous.

RESULT

The current study was conducted in BMCH (Bolan Medical Complex Hospital), Al-Khidmat pharmacy and different

diagnostic laboratories focusing on 320 patients, and majority of them were males 191(57.9%). while majority of study group 119(37.2%) comprised of 25-35 years of age, while 27% subject were more than 35 years of age. Surprisingly, 125(39%) subject were educated up till metric, while 56(17.5%) respondents have no any education and 53(16.6%) has only religious education. High numbers of study subjects were private employee, while 9% were unemployed, and most of the study subjects (39%) have income between 18,000-25,000.

Table 1 shows the socio-demographic characteristics of diabetic patients. Study focusing on320 diabetic patients and majority of them were males 191 (59.7%). while majority of study group 119 (37.2%) comprised of 25-35 years of age, while 27% of the Subjects were more than 35 years of age. Surprisingly, 125 (39%) subjects were educated up till Metric while 56 (17.5%) respondents have no any education and 53(16.6%) has only religious education. High numbers of study subjects were Private employee, while 9% were unemployed, and, most of the study subjects (39%) have income between 18000-25000 PKR (Pakistani Rupee).

Table 2 shows the percentage and frequency of disease characteristics and according to table 149 (46.6%) respondents have type-1 diabetes and 79(24.7%) have type-2 diabetes, while 92 (27.8%) patients don't know about their disease type. And 145(45.3%) patients use only two medicines and only 19 (5.9%) used more than three number of medicines, and only 6 (1.9%) patients answered that they do not take any type of medicine in their disease. And 126 (39.4%) patients answered that their Diabetes is controlled, 125 (39.1%) said that their diabetes is not controlled, while 69 (21.6%) patients don't know that their Diabetes is controlled or not.

Table 3 shows the %age and frequency of most common myths among diabetic patients, and among these 83% of diabetic subjects believe that "in diabetes sugar cannot be used at any cost", while 68% believed that special diabetic food is used in diabetes, 66% patients believe that they can suffer from other diseases and infections due to diabetes, and 61% believed that diabetic patients should never take sweets and chocolates, while 67% said that rice should not be used in diabetes, and 61% patients believed that use

Table 1: Socio-demographic profile of Diabetic patients		
Demographic Categories	Characteristics	N (%)
Age-group	14-24	27 (8.4%)
	25-35	119 (37.2)
	36-46	89 (27.8)
	47-57	49 (15.3)
	58-68	25 (27.8)
	69-79	9 (2.8)
	80 or above	2 (0.6)
Gender	Male	191 (59.7)
	Female	129 (40.3)
Marital status	Married	251 (78.4)
	Single	69 (40.3)
Education	No education	56 (17.5)
	Only Religious	53 (16.6)
	Matric	125 (39.1)
	F.A/ F.Sc.	58 (18.1)
	B.A/ B.Sc.	10 (3.1)
	M.A/ M.Sc.	18 (5.6)
Income	<10	111 (34.7)
	10-18	126 (39.4)
	18-25	56 (17.5)
	>25	27 (28.4)
Living status	Urban	259 (80.9)
	Rural	54 (16.9)
Occupation	Un-employed	28 (8.8)
	Private	148 (46.3)
	Government	119 (37.2)
	Business	25 (7.8)

Table 2: Percentage and frequency of disease characteristics

Types of disease	N (age %)
Type-I DM	149 (46.6)
Type-II DM	79 (24.7)
Don't know	92 (27.8)

Table 3: Percentage and frequency of most common misconceptions among diabetic patients

QUESTIONS	Yes	No	Don't Know
As you are diabetic patient you must avoid sugar at all costs.	264(82.5%)	48(15.0%)	8(2.5%)
As you are diabetic patient eat a lot of non-starchy vegetables, beans and fruits.	186(58.1%)	83(25.9%)	51(15.9%)
Your diabetes was caused by eating too much sugar.	132(41.3%)	144(45.0%)	44(13.8%)
As you are diabetic patient concentrated sweets used in limits.	248(77.5%)	57(17.5%)	15(4.7%)
As diabetic patient you are you can't eat sweets and chocolates.	196(61.3%)	103(32.2%)	21(6.6%)
As you are diabetic patient you could have got diabetes from somebody else.	168(52.5%)	123(38.4%)	29(9.1%)
As you are diabetic patient you can eat watery foods as many and as you like include most type of fruits and juices.	197(61.6%)	80(25.0%)	43(13.4%)
As you are diabetic patient you can eat as much as you eat because fruit is healthy.	178(55.6%)	95(29.7%)	47(14.5%)
As you are diabetic patient you should eat small amount of starchy foods such as bread and potatoes.	196(61.3%)	79(24.7%)	45(14.1%)
As you are diabetic patient you should eat special diabetic food.	219(68.4%)	75(23.4%)	26(8.1%)
As you are diabetic patient it is advise to take a food that is high in proteins include nuts, seeds, etc. etc.	199(62.2%)	80(25.0%)	41(12.8%)
As you are diabetic patient you are more likely to got infections and other illnesses.	212(66.3%)	83(25.9%)	25(7.8%)
As you are diabetic patient a high protein diet is not suitable for you.	192(60.0%)	83(25.9%)	45(14.4%
As you are diabetic patient it is advice to take three meals and one or two snacks each day.	210(65.5%)	67(20.9%)	43(13.2%)
As you are diabetic patient eat slowly and stop when full.	228(71.3%)	69(21.6%)	23(7%)
As you are diabetic patient rice is prohibited for you.	213(66.6%)	79(24.7%)	28(8.8%)
As you are diabetic patient underground vegetables are not commonly used including potato, carrot and reddish etc.	193(60.3%)	92(28.8%)	35(10.9%)
Sugar free items are more expensive as compared to others.	206(64.4%)	84(26.3%)	30(9.4%)
Diabetes mellitus predominantly effects men.	127(39.7%)	106(33.1%)	87(27.2%)
Diabetes mellitus is more common in rich people.	157(49.1%)	95(29.7%)	68(21.3%)

•P-values indicate the statistical significance of differences between selected characteristics

of underground vegetables reduce their blood sugar level and 61% said that they have got the diabetes from anyone else, and surprisingly 49% patients believed that diabetes predominantly effects the rich people, and 61% said that carbohydrate food like potato, bread etc. should use in a limited quantity, while 56% said that fruit is a healthy so we can eat as much as possible.

Table 4 shows the socio-demographic characteristics of diabetic versus mean knowledge and misconception scores. Table also shows the effect of demographic categories on the mean knowledge and misconception scores, after assessing the accuracy of respondents the knowledge is with significant in the education level (P=0.013), marital status (P=0.032), and occupation (P=0.001), but no significant difference in gender, age group, income and residence. While the prevailing misconception was with significant difference in the education level (P=0.002), income (P=0.004) and occupation (P=0.002).

Table 5 shows the disease characteristics versus mean knowledge and misconception scores in this the mean knowledge score was not significant in the type of disease, number of medicines, and diabetes control. While prevailing misconception was with significant in the number of medicines (0.001), and diabetes control (P=0.009).

DISCUSSION

The current study reveals that there is a significant difference in prevailing myths amongst respondents with different standards of education, this was also found by Nisar *et al* and Rai and Kishore. Myths and misconceptions in population prevail due to different reasons. These myths are so deeply rooted in the society that education and knowledge alone is not sufficient to bring about behavioral changes in population.[12] Attitude towards the health and personal care

Table 4: Socio-demographic profile of Diabetic patients vs. knowledge and misconception scores

Demographic Categories	N (%age)	Mean knowledge score	Significance (P-value)	Mean Misconception Score	Significance (P-value)
Age-group					
14-24	27 (8.4%)	5.19±1.90	0.152	2.81±3.01	0.332
25-35	119 (37.2)	4.75±1.743		3.26±2.196	
36-46	89 (27.8)	5.00±1.70		3.21±2.28	
47-57	49 (15.3)	4.59±1.61		3.84±2.25	
58-68	25 (7.8)	4.72±1.72		3.60±2.32	
69-79	9 (2.8)	4.78±2.43		3.67±3.64	
80-90	2 (0.6)	1.50±0.70		6.00±4.24	
Gender					
Male.	191 (59.7)	4.65±1.91	0.115	3.36±2.48	0.877
Female.	129 (40.3)	5.05±1.46		3.35±2.22	
Marital status					
Married	251(78.4)	4.72±1.71	0.032	3.37±2.30	0.539
Single	69 (40.3)	5.14±1.87		3.35±2.22	
Education					
No education.	56 (17.5)	4.30±2.017	0.013	2.80±2.15	0.002
Only religious	53 (16.6)	4.53±1.99		3.06±1.79	
Metric.	125 (39.1)	5.13±1.49		3.16±2.35	
F.A/F.Sc	58 (18.1)	4.53±1.71		3.81±2.85	
B.A/B.Sc.	10 (3.1)	5.80±1.54		4.90±1.66	
M.A/M.Sc.	18 (5.6)	5.33±1.45		4.94±2.43	
Income					
<10,000	111 (34.7)	4.91±1.75	0.103	2.74±19	0.004
10-18,000	126 (39.4)	4.60±174		3.60±2.07	
18-25,000	56 (17.5)	4.77±1.78		3.79±2.68	
25,000+	27 (8.4)	5.44±1.69		3.85±3.23	
Locality					
City.	259 (80.9)	4.84±1.67	0.901	3.34±2.38	0.738
Village.	54 (16.9)	4.66±2.09		3.42±2.34	
Occupation					
Un-employed	28 (8.8)	5.00±1.96		3.14±2.25	
Private	148 (46.3)	5.05±1.65	0.001	3.09±2.27	0.002
Government	119 (37.2)	4.81±1.58		3.96±2.45	
Business	25 (7.8)	3.20±2.12		2.28±2.15	

is influenced by various social, cultural, socioeconomic and healthy factors.[13,14]

Diet has been mainstay of therapy in diabetes for centuries. Dietary recommendations for diabetes have changed over the past 15 years and it should be based on a high intake of complex carbohydrate and fiber, with a restriction of fat intake.[15]

In this study the majority of population had only primary education and (17.5%) were illiterate, and only (3.1%) have got the education at the graduation level, while only (5.6%) hold the master's degree. So, study shows that more subjects who have no any education, or have a lower educational level held misconception and myths more about D.M

also have poor knowledge about diabetic diet. And those patients who have education have better knowledge as compared to illiterate.

In general, DM knowledge in population has positive association with an education degree.[16]

Secondly the prevalence of myths is higher in those who have very low income, because those patients who have low income have low level of education and again education have significantly effect on knowledge. In our study, the most common myth is that "in DM sugar cannot be used in any condition", which is not true, as diabetics may consume small amount of sugar, as well as sweets and carbohydrates. The study also reveals that a

Table 5: Table of Disease characteristics versus mean knowledge and misconception scores

Disease characters	N. (%age)	Mean knowledge Score	Significance (P-Value)	Mean misconception Score	Significance (P-Value)
Type of Disease					
Type-I	149(46.6)	4.70+1.73	0.264	3.07+2.19	0.108
Type-II	79 (24.7)	4.97+1.90		3.91+2.60	
Don't know	92 (27.8)	4.84+1.66		3.33+2.40	
Number of Medicines					
One	70 (21.9)	4.53+1.58	0.170	3.24+2.26	0.001
Two	145 (45.3)	4.92+1.69		3.23+2.25	
Three	80 (25.0)	4.73+2.02		3.09+2.46	
More than Three	19 (5.9)	5.32+1.56		4.47+2.03	
No Medicines	06 (1.9)	4.83+1.83		7.50+2.42	
Diabetes Control					
Controlled	126 (39.4)	5.09+1.45	0.151	3.75+2.20	0.009
Un-Controlled	125 (39.1)	4.74+1.78		3.11+3.07	
Don't know	69 (21.6)	3.07+2.69			

•P-values indicate the statistical significance of differences between selected characteristics.
•Not significant (P>0.05)

substantial proportion of the sample (41.3%) believed that excessive sugar intake can directly cause D.M. this has an element of truth in it, in that excessive sugar intake may lead to obesity and hence to D.M. but the fact that the misconception may be based on another non-scientific basis that requires correction and explanation by means of health education.

In this study, large number of study population believed in special diet for control of blood sugar level as widely believed in other parts of the world.[9] While in Pakistan, Nighat Nisar *et al*[10] showed that 55% of non-diabetic population had such belief. This shows that diabetic persons had high prevalence of dietary misconception as compared to non-diabetics. A healthy diet for someone with diabetes is the same as a healthy diet for anyone else, low in fat particularly saturated and transfat, moderate in salt and simple sugar with meal based on whole grain foods, vegetables and fruits. The optimal macronutrient composition of the diet for patients with diabetes is controversial.[17-19] American Diabetes Association recommends a diet that includes carbohydrates from fruits, vegetables, whole grains, legumes and low fat milk. [20] The so-called diabetic foods offer no special benefits and they still raise the blood sugar levels, are usually more expensive and can have also laxative effect if they contain sugar alcohols.

In this part of the world, diabetic patients also have fallacies regarding vegetables and 81.9% participants did not use roots and tubers and same percent of diabetics believed that bitter vegetables reduce blood sugar level which is not true. Roots and tubers can be consumed by diabetic persons in moderation while bitter vegetables are not helpful in reducing blood glucose level. On the other hand these myths make the diet unpleasant, fiber free and difficult to adhere to, and finally results in poor control of diabetes.

Twenty five percent participants in this study said that fruits are prohibited which is again not true. In a study by Nisar N *et al*[10] 42% non-diabetic healthy persons believed that fruits can be taken in excess by diabetic patients. This shows that both diabetics and non-diabetic person have different misconception regarding fruits. Fruits are nature's gift to mankind; they contain substantial quantities of essential nutrients and are sources of fibers and they should be consumed daily in moderation by diabetics to improve overall balance of the diet.

Rice is prohibited in diabetes was another misconception found in the study population (67%) while the fact is that there is little difference in carbohydrate contents of rice and wheat. We could also identify in our study the prevailing myths in Quetta city, which should enable us to plan for effective health education programs for the control of diabetes mellitus. One of the previous studies in Quetta reported that the higher the age, socioeconomic, and educational levels, the higher the DM knowledge of the population. In both primary and secondary prevention of DM, education and information are key factors for successful public health public policies.[16]

DM education is also essential in improving patient's attitudes, lifestyle changes and adequate therapy adhesion. In a review article by Asha *et al* it was observed that the patients' nutritional knowledge and the control of diabetes

improved significantly after counseling in those patients in whom control had been adequate. The educational programs had a long term effect on the patients which is reflected in their overall disease management. These education programs should be in a group setting as it has been found to be more effective than individual education and should be culture specific rather than knowledge based program.[21] The reason for prevailing myths and misconceptions about DM are multi-factorial. These include lack of knowledge about diabetes, poor education, cultural beliefs and social misconceptions. It is very important to identify the prevailing myths in our community to able to launch proper health education programs for control and prevention of Diabetes Mellitus.[22]

CONCLUSION

Myths and misconceptions about DM are prevailing in our society and can have consequences upon the health seeking behavior of the patients, and these myths delays the people from seeking doctor's advice, which effects the control of the disease and even complicate it.

In this study, education is shown to be associated with increase knowledge about Diabetes Mellitus and major reason for prevailing myth is the low education level. Also people are not aware about the normal blood sugar levels, role of life style changes in control and treatment of diabetes. So, there is a great need for continuous health education of the patients. so, efforts should be made to promote education and health awareness regarding diseases, with more emphasis on addressing myths regarding diabetes mellitus the illiterate group should be more targeted for effective health education using proper doctor-patient relations and communications. Take a step about this disease and its preventive as well as treatment options, for this purpose we need to launch health education programs about these myths and regular treatment of Diabetes Mellitus, and this can be done by all members of health care team through structured program using different health education strategies such as focus group discussion, demonstrations and story-telling. We recommended also further research on a large scale and hence improve their quality of life.

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