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Knowledge, Attitude and Perception of Type-2 Diabetics about Hypoglycemia in Laeeque Rafiq Hospital, Multan, Pakistan

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Abstract: Prevention of hypoglycemia plays a vital role in managing diabetes. Patients' knowledge, perception and attitudes have significant effect upon self-management of diabetes. The current study is designed to explore the knowledge, perceptions, attitude and mythologies of type 2 diabetes patients in primary health care of South Punjab in Pakistan. It is a cross sectional study conducted at Laeeque Rafiq Hospital Multan. Patients' knowledge, perceptions and mythologies and attitude were explored using a pre-structured, interviewer-administered questionnaire. The results of the study suggest that healthcare professionals should provide more education to patients for self-management of hypoglycemic conditions. There is an urgent need for synchronized educational programs with a priority to emphasize on poorer, rural and less educated population.

Keywords: Hypoglycemia; type 2 Diabetes, Knowledge, Primary Health Care Unit

1. INTRODUCTION

Diabetes is a major and rapidly increasing health issue. In a study conducted by (King *et al.,*2000) it was reported that globally, the number of people affected by diabetes is more than one hundred and seventy one million and this number is expected to increase to three hundred and sixty six million by the year 2030. Hypoglycemia is one of the most commonly faced problems to diabetic patients in diabetes management. It was revealed in various studies conducted in Pakistan and some other South Asian countries (Maina, *et al.*, 2010, Hasnain and Sheikh, 2010) that the awareness about the disease in the patients need much improvement, especially in the rural areas. This lack of awareness causes in poor glycemic management and become the reason of more problems. The increased frequency of hypoglycemia and its counter regulatory hormonal response results in poor glycemic management. Increasing hypoglycemia in patients may also be related to deaths due to heart diseases (Kalra, *et al*., 2013).The guiding principles of American Diabetes Association (ADA) emphasize on customized targets and lower the risk of hypoglycemia in patients with long-term diabetes and comorbidities.

The incidence of diabetes is growing at a much faster rate in the developing countries (Bengoa, 2003). The lifelong persistence of type 2 diabetes deserves special consideration. The main reason is lack of awareness, careless attitude and inappropriate perception of the disease. Changes in lifestyle including healthy diet and physical activity can prevent diabetes. A study was conducted by Arora*et al*. (2020) to know about the knowledge, misconceptions and attitude of type-2 diabetes patients regarding fasts from various religions. The study revealed that in spite of the fact that fasting is a common practice among different religions; a lot of improvement is required to maintain the knowledge and attitude of type 2 diabetes patients regarding fasts.

The results of the studies discussed above leads to the importance of knowledge, perception and attitude about hypoglycemia and the potential preventive policies to manage hypoglycemia in type-2 diabetics.

A thorough search of literature on knowledge, perception and attitude towards hypoglycemia in type 2 diabetes patients reveals that a very few studies are conducted in this regard. In South Punjab of Pakistan, no study is conducted to assess the problem-solving ability, knowledge and perception of patients towards disease in the context of hypoglycemic conditions. The main goal of this study was to assess hypoglycemia problem-solving ability in type 2 diabetes patients who had experienced hypoglycemia.

2. MATERIAL AND METHODS

This is a cross-sectional study conducted to assess the knowledge, perception and attitude towards diabetes and hypoglycemia in type-2 diabetic patients of primary health care in Pakistan.

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A sample consisting 261 patients was taken. Sample size was computed using the appropriate formula with $confidence\ level = 95$, $The\ margin\ of\ error(E) = 6\%$, and response distribution was taken as 50%. Systematic random sampling technique was used to select the sampling units. Every third patient attending the hospital was included in the sample. The patients who were suffering from type-2 diabetes mellitus for the last five years or more and being treated with either oral hypoglycemic agents or insulin were included in the sample. A structured questionnaire consisting of four parts (socio-demographic characteristics of the patient, attitude, myths and beliefs of patients about hypoglycemia) was designed to collect the data.

MS Excel was used to make some initial analyses. MINITAB-16 was then used to explore the collected data in detail. The relationship of knowledge with different variables was analyzed using the Pearson's Chi-square test. The existence of a statistically significant association of the variable knowledge with six different variables (gender, duration of disease, age, education, employment and income) was checked. Response of the variable "Knowledge" is categorized as Satisfactory and Not Satisfactory. Patients scoring less than 50% were categorized as "Not Satisfactory" and the patients who earned more than 50% score were categorized as "Satisfactory". The attitude of patients related to diet, was observed. A question related to ten different food items including butter, bakery products, sweet meat, carbohydrates, sweet fruits, deep fried items, tea/coffee, meals, breakfast and alcoholic beverages was included in the questionnaire. The overall consumption of all the food items stated before was checked through the developed "Dietary Habits Index". A comparable quantitative index duly bound by known lower and upper limits preferably on scale of 0 to 100 communicates properly. For the purpose, a dietary habit index was constructed which did the job with following procedural details.

The "Dietary Habits Index" is developed by using the weighted sum of above mentioned ten food items. The weights were given according to the suggested consumption of each of the 10 above stated foods. Then weight of the i^{th} food item i.e. W_i is computed as follows:

$$W_i = \frac{R_i}{\sum_{i=1}^{10} R_i}$$

TheR_i in the above formula is the suggested amount of consumption of i^{th} food item. The suggested amount of consumption and calculated weights for several food items are presented in **(Table 1)**. The weight(W_1) for the first food item i.e. butter is calculated as below:

$W_1 = \frac{1.3}{64.9} = 0.02$, R_1 i.e. the suggested amount of consumption of butter is taken as 1.3 is per week and $\sum_{i=1}^{10} R_i$(the sum of suggested amount of consumption of all the ten food items) is 64.9.

Table 1: Recommended amount of consumption and Computed Weights for Different Food Items

i	**Food Item (serving size)**	R_i	W_i	$R_i \times W_i$
1	Butter (25 gram)	1.300	0.020	0.026
2	Bakery products— fresh cream cake, pastry (100 gram)	3.000	0.050	0.138
3	Sweet Meat (50 gram)	0.000	0.000	0.000
4	Carbohydrate —starchy vegetables (100 gram)	12.600	0.190	2.446
5	Sweet Fruit—bananas, mangoes, figs, dates, all dried fruit (100 gram)	3.000	0.050	0.138
6	Deep Fried Items— Samosa, Fried Chicken, Kebab etc. (100 gram)	0.000	0.000	0.000
7	Tea/ Coffee/ Other caffeine drinks (120 ml)	14.000	0.220	3.020
8	Meals (Typical Asian human intake of 2 chapatis with gravy and/or vegetable/ pulses) (This excludes Chargha etc.)	10.000	0.150	1.540
9	Breakfast ((1 Paratha and 1 Egg/gravy) or (2 Slice and 1 Egg) or (4 Rusk))	7.000	0.110	0.755
10	Alcoholic Beverages (1 Peg i.e. 30ml whiskey OR 100ml wine OR 250ml beer)	14.000	0.220	3.020
Sum		64.900	1.000	11.08

The Value of Dietary Habits Index for each patient is formulated using the weightsW_i. The constructed index is presented here:

$$Valueof\,\mathrm{DHI} = (Butter \times 0.02) + (Bakeryproducts \times 0.05) + (SweetMeat \times 0.00) + (Carbohyderates \times 0.19) + (SweetFruit \times 0.05) + (DeepFrieditems \times 0.00) + (Tea \times 0.22) + (Meals \times 0.15) + (Breakfast \times 0.11) + (AlcohalicBeverages \times 0.22)$$

The mentioned DHI was calculated for each patient included in the sample. After that a Relative Index (RI) was calculated for all the patients.

$$RelativeIndex(RI) = \left(\frac{ValueofDHI}{\sum_{i=1}^{10}(R_i \times W_i)}\right) * 100$$

The following decision rule was made to check the patient's attitude about different food items: Careful Attitude About Diet if RI ≤ 100, Careless Attitude About Diet if RI > 100.

3. RESULTS

The study included 261 patients out of which 119 (46%) were females and 142 (54%) were males. One part of questionnaire was dedicated to assess the knowledge of patients. Fourteen questions in the questionnaire were about the knowledge of patients regarding symptoms of the disease; three questions were about the knowledge of patients regarding NORMAL blood glucose level of a healthy person. It was observed from the study that patients have an average level of knowledge about the disease. About 52% patients answered correctly about symptoms level of low or high blood sugar. The question about NORMAL level of blood glucose of a healthy person is correctly answered by 43% patients. The percentage of correct answers of male and female patients and overall patients are presented in **(Table 2)**

Table 2: Percentage of Correct Answers of Males, Females, and Overall Patients

Sr. No.	Question	Percentage of Correct Answers		
		Female	Male	Overall
1	Reason of Excessive Swatting	68.91	78.17	73.95
2	Reason of Palpitation	70.59	61.97	65.90
3	Reason of Unusual Dizziness	76.47	74.65	75.48
4	Reason of Thirst to get fed	73.95	69.01	71.26
5	Reason of Lack of consciousness	45.38	46.48	45.98
6	Reason of Nausea	31.93	22.53	25.28
7	Reason of Nervous	34.45	45.07	40.23
8	Reason of Shakiness	31.93	29.58	30.65
9	Reason of Anger	75.63	69.01	72.03
10	Reason of Sleeplessness	36.97	29.58	32.95
11	Reason of Visual Impairment	69.67	69.71	69.73
12	Reason of Headache	36.97	40.14	38.70
13	Reason of Paleness	36.97	41.55	39.46
14	Reason of Weakness	80.67	67.61	73.56
15	Fasting BG Level Normal	42.86	42.25	42.53
16	Random BG Level Normal	42.02	45.07	43.68
17	BG Level More Serious to Handle	75.63	69.71	72.41
Reasons of blood glucose gone lower than normal				
18	Insulin Overdose	25.21	21.83	23.37
19	Medicatio0verdosed	25.21	28.87	27.20
20	Oral Misfeed	96.64	95.07	95.79
21	Injectable Misfeed	100.00	100.00	100.00
22	Over Exertion	10.92	16.90	14.18
23	Over Stress	70.59	76.76	73.95
24	Insomnia	90.76	88.03	89.27
25	Prolonged Hunger	22.69	19.01	20.69
26	Medicine Precautions	29.41	19.01	23.75
Reasons of blood glucose gone Higher than normal				
27	Under dose Insulin	29.41	23.24	26.05
28	Under Dose Medication	33.61	35.92	34.87
29	Oral Misfeed	3.36	4.93	4.21
30	Injectable Misfeed	0.00	0.00	0.00
31	Over Excursion	93.28	83.80	88.12
32	Over Stress	35.29	21.83	27.97
33	Insomnia	9.24	9.86	9.58
34	Prolonged Hunger	89.08	95.07	92.34
35	Medicine Precaution	15.97	16.20	16.09
36	Unusual Feeding	23.53	28.17	26.05

The relationship of knowledge with different variables like gender, duration of disease, age, education, income and employment were checked using Pearson Chi-Square testate 5% level of significance. The variable knowledge was associated with education, employment status and income.**(Table 3)** shows the results of associated variables

Table 3: Degrees of Freedom, Chi-Square and P-Value for Pearson Chi-Square Test

Variables	D.F	Chi-Square	P-value
Knowledge and Gender	1	0.859	0.354
Knowledge and Duration of disease	1	0.030	0.862
Knowledge and Age	3	3.107	0.375
Knowledge and Education	4	11.142	0.025
Knowledge and Employment	4	34.897	0.000
Knowledge and Income	4	34.897	0.000

The response of the question related to ten different food items to check the patients' attitude towards their diet revealed a very careless attitude towards intake of sweet meat deep fried items is revealed after analysis of data. One hundred and sixty three (62%) patients and 188 out of 261 (72%) patients have careless attitude towards amount of consumption of sweet meat and deep fried food.

The patients' attitude towards diet was evaluated through value of Dietary Habits Index and Relative Index. Both indices were calculated for all of the 261 patients included in the sample. The computed value of relative index of only two patients is greater than 100 which indicates only 2 patients from the sample of 261 had careless attitude regarding their diet.

As mentioned earlier that one portion of questionnaire was developed to evaluate the patients' attitude towards their inability of self-care. The response of patients related to this part revealed that 84 (32%) patients had never faced a situation when they could not help themselves and had to be taken care by others in complications because of diabetes,104 (40%) patients faced such a situation only one time and it was occurred twice to 42 (16%) patients.'

According to 31 (12%) patients, they have never checked their blood sugar once a month, majority of the patients i.e. 86 (33%) reported that they check their blood sugar two times in a month. Only 8 (3%) patients reported that they check their blood sugar more than 10 times in a month. Patients were asked that how often they can correctly sense though feelings like sweating, nausea, dizziness, headache, extreme hunger, and/or shakiness etc. that if their blood glucose level spiking up or down.

(Table 4) presents the patients' perception regarding various diseases to rank them (highest to lowest) according to their role of danger in summarized form.

Table 4: Perception of Patients about Different Diseases as a Reason of Lowering Down their Blood Glucose

Grades	Percentage of Patients					
	Cardiac	Hypertension	Renal Disorder	Liver Disorder	Thalassemia	Constipation
0	9	10	30	37	47	37
1	10	8	15	13	12	18
2	10	10	2	4	4	15
3	5	5	4	5	4	5
4	3	4	2	5	3	2
5	8	10	19	10	10	8
6	2	9	7	9	4	3
7	24	7	5	8	8	2
8	9	22	7	3	5	6
9	3	2	3	1	0	0
10	19	12	4	3	0	1

4. DISCUSSION

The investigated data of the present study provides an insight related to awareness regarding hypoglycemia in type-2 diabetes patients. A relationship between Education and Knowledge can be analyzed from the collected data. Same was observed by Hawthorne and Tomlinson (1999).

The analysis of the collected data also showed the relationship of knowledge with income level and employment status. On the whole, the knowledge about disease was of average level. It was observed in the studies conducted in rural Islamabad (Ulvi *et al*., 1999) and Quetta (Ali, and Pirkan, 1998) that awareness related to the complications of diabetes is inadequate in both cities. It shows that most of the diabetes patients had not been properly educated about their disease by their doctor and other health workers. A study conducted by Shera, *et al.*(2006) even showed that the lack of knowledge about diabetes even among some healthcare professionals.

It was also observed in research works conducted in Karachi that more than 80 percent of the respondents in their study had misconceptions related to diet. A research study (Muninarayana, 2010) conducted in India for the same purpose also reported the same results.

Research works (We,Ho and Lee, 2002 and Arslantas and Metintas, 2008) conducted in singapore and Turky also revealed about misconcetions among people related to diet.

The attitude of patients towards disease is not bad. It was reported by that 83% patients have their average fasting Blood Glucose level beyond the normal limits; the average random blood glucose level of 79% patients is beyond the limits. These percentages are contradictory to their stated dietary habits. An overall careless attitude towards diet was reported only by two patients. The average blood sugar must have been within the normal limits if almost all the patients had careful attitude towards diet. These contradictory results reflect that patients had falsely reported about their dietary habits. All the patients are provided guidance regarding their diet plan on their first visit to hospital and so they already have awareness about their correct diet plan but they are not having their diet according to that plan.In a study conducted by Speight, Reaney and Barnard(2009) it was revealed that diabetes patients are more aware about their disease and its influence on their social life and work.

It was also observed that some patients have adopted sedentary life style and unhealthy dietary habits like intake of excessive sugar and fatty meals. This finding is similar with the study conducted in Peshawar (Zahir and Diju, 2012).

The results of the study showed that5% patients had the insightthat the diseases like headache, fever, heart attack, hypertension, kidney stone and renal are more dangerous than diabetes. 24% patients considerthat cardiovasculardiseases are the root cause todrop their blood glucose level.

Patients' perception about the disease was almost same according to their demographic characteristics. The same results were observed in a study conducted in Saudi Arabia (Albargawiab*et al*., 2016). The psychosocial stress at work place doubles the risk of type 2 diabetes (Heraclides*et al*., 2009). Present study also documented that more than half of the diabetic persons think that their performance is affected by their disease and their employees/co-workers consider them as a liability. This perception may be considered as one of the reason for the depression attacks experienced by the diabetic population.

In the light of the above facts, we can conclude that a collaborative work is required to create awareness among people regarding their proper diet, medicine and to maintain a healthy life style. Trained health workers, nutritionist, and awareness programs should be arranged to improve the public health. Extensive studies are required to aware people about diabetes.

5. CONCLUSION

The poor knowledge of patients suggests the need of great improvement to increase patients' awareness regarding hypoglycemia and diabetes. Lack of knowledge has a great influence on patients' attitude towards the disease. The findings of the research revealed that most of the patients perceived that diabetes is an incurable disease and ultimately it leads the patient to death.

The awareness programs and education about disease can be helpful to achieve a good knowledge and perception related to the risk factors, symptoms, complications and avoidance of disease

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