

# Blood Glucose Levels, Risk Factors and Complications Among Diabetic Patients Attending OPD of National Institute of Diabetes and Endocrinology, Karachi

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## ABSTRACT

**Objective:** To evaluate awareness among diabetic patients attending OPD of National Institute of Diabetes and Endocrinology, Karachi, about the baseline blood glucose levels, Risk factors and Complications.

**Study Design:** Cross-sectional study

**Place and Duration of Study:** This study conducted at the OPD of National Institute of Diabetes and Endocrinology (NIDE), at OJHA campus of Dow University of Health Sciences, Karachi from January to March 2016 in Karachi.

**Materials and Methods:** Adult, age 18 years and above, cases of diabetes were recruited from OPD of National Institute of Diabetes and Endocrinology (NIDE), at OJHA campus of Dow University of Health Sciences, Karachi. Data was collected using a structured questionnaire which was translated into local language i.e. Urdu. SPSS was used for statistical analysis.

**Results:** A total of 100 participants completed the interview out of which 53% were male and 47% were female. Mean age of the participants was  $49.3 \pm 10.7$  years. Regarding the knowledge about target blood glucose levels, only 39% of the participants correctly identify the fasting blood glucose level while only 26% correctly answered random blood glucose levels. Overall mean score of knowledge and awareness was 40%. Male had better knowledge than female. Mean score for male was 50% compared to 30% among female. This difference was statistically significant  $p$ -value  $< 0.05$ . Over all 45% of the participants were found to have poor knowledge scores, 35% had acceptable while only 20% had acceptable knowledge scores.

**Conclusion:** This study found that there is low level of awareness among the patients attending diabetic outpatient clinics of NIDE. This indicates gaps in the patient care which needs attention. There is need to integrate patient education regarding glycemic targets, risk factors, complications and self-care as essential component of care through different channels of communication.

**Key Words:** Awareness, Baseline Blood Glucose Levels, Diabetes Mellitus

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## INTRODUCTION

Diabetes is a major and growing health problem affecting more than 171 million people worldwide and the number is expected to rise to 366 million by 2030<sup>1</sup>. Type 2 Diabetes will continue to account for 90% of all the cases. In Pakistan 9.5% of the urban and 9.4% of the rural population suffer from type 2 diabetes.

Overall glucose intolerance (diabetes and impaired glucose tolerance) is 22.04% in urban and 17.15% in rural areas<sup>2</sup>. According to the WHO estimates, Pakistan ranked seventh in prevalence of Diabetes. These figures however represent tip of the iceberg with many cases still undiagnosed<sup>3,4</sup>.

Despite all the research, diabetes remains under diagnosed. This then ultimately presents with complications, the direct and indirect costs of which are enormous<sup>5,6</sup>. Diabetes care aims at improving the quality of life of patients with type 2 diabetes through good glycemic control, control of risk factors, lifestyle modification, prevention of complications and diabetes education<sup>7,8</sup>. Diabetes education is the cornerstone of diabetes care. Improved training of the primary health care providers and patients with diabetes is therefore beneficial<sup>9</sup>. Several studies of family physicians identified the need for improvement in their practices for treating and educating diabetics<sup>10</sup>. Pakistan is one of high burden countries with respect to diabetes and

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prevalence of diabetes ranges from 7% to 11% with regional variation<sup>11</sup>. In Pakistan, there is paucity of information about knowledge and attitudes concerning glycemic control, complications and the health impact of diabetes as only few studies have been conducted yet<sup>12</sup>.

## MATERIALS AND METHODS

A cross-sectional study conducted from January to March 2016 in Karachi. Study was conducted at a diabetic clinic in National Institute of Diabetes and Endocrinology (NIDE), Karachi. NIDE was selected as study site for this study because this is one of few endocrinology centers of Karachi where large number of patients with diabetes and other endocrine disorders from all across the Karachi and other parts of province as well come for seeking care.

Data was collected using a structured Questionnaire. This questionnaire was divided into five main sections namely demographic data, knowledge about diabetes and glycemic control, risk factors, complications and miscellaneous. The questionnaire was translated into local language i.e. Urdu. Translated version of questionnaire was back translated into English by independent person for accuracy of translation.

## RESULTS

A total of 100 participants completed the interview out of which 53% were male and 47% were female. Mean age of the participants was 49.3 years with standard deviation of 10.7 years. Proportion of the participants having age less than 40 years was 35%. About 30% of the participants either had no schooling or went to a madressah, 43% had primary or secondary level education while 27% had education higher than secondary level. Median income was PKR 25,000 with interquartile range of 15,000-35,000 per month. Mean duration of diabetes since diagnosis was 10.5 years (Table 1).

Majority 90% of the participants were found to have type II diabetes. A little more than quarter 26% of the patients had received diabetic education. Regarding the knowledge about target blood glucose levels, only 39% of the participants correctly identify the fasting blood glucose level while only 26% correctly answered random blood glucose levels. Majority of the participants 78% believed diabetes is raised blood glucose levels. About 26% of the participants considered diabetes diet as a healthy diet for most people. About two third 66% of the participants thought that family members should be screened for presence of diabetes. Majority 85% of the participants believed smoking is a risk factor for their health. Very few participants had knowledge that unsweetened fruit juices also increase blood glucose levels as only 14% of the respondents answered correctly. Regarding the

wound healing in diabetics near three quarters 70% of the participants knew slow healing of wounds in diabetics. A little more than half 53% of the patients considered medications more important than diet and physical activity to achieve glycemic control. About 62% of the participants believed that diabetes can affect any part of the body. More than two third 68% of the participants had knowledge about sensory loss in diabetes. A little less than half 46% of the respondents considered obesity to increase the risk of complications. About three fourth 73% of the participants considered exercise to help control blood glucose levels. Only 18% respondents knew that wearing shoes a size bigger than usual helps prevent foot ulcers. Regarding low fat diet, 59% of the participants believed eating foods lower in fat decreases risk for heart disease. A little more than one third 36% of the participants considered it important to consult an ophthalmologist. Regarding damage to kidney caused by diabetes, 70% of the participants thought diabetes can damage kidneys. Concerning risk of diabetes among offspring, 41% believed having diabetes increases the risk of diabetes among children (table 2).

**Table No.1: Characteristics of participants**

Characteristic	% age	n
Age in years		
Mean (SD)	49.3 (10.7)	
Less than 40 years	35	35
40 years or more	65	65
Sex		
Male	53	53
Female	47	47
Education Status		
No schooling	18	18
Primary	22	22
High school	21	21
Intermediate	13	13
Graduation & above	14	14
Madrasah	12	12
Monthly income		
Median (IQR)	25000 (15000-35000)	
Duration of Disease in years		
Mean (SD)	10.5 (5.6)	

Overall mean score of knowledge and awareness was 40%. Male had better knowledge than female. Mean score for male was 50% compared to 30% among female. This difference was statistically significant p-value <0.05. Over all 45% of the participants were found to have poor knowledge scores, 35% had acceptable while only 20% had acceptable knowledge scores. Among the male 34% (18) had poor knowledge, 45% (24) acceptable and 21% (11) had good knowledge. Among female, 51% (24) had poor knowledge, 32% (15) acceptable and 17% (8) had good knowledge.

With respect to education, those who had no education, 52% had poor knowledge, 35% acceptable and only 13% had good knowledge scores. In contrast, those who have education higher than secondary, only 15% had poor scores, 40% had acceptable and 45% had good scores.

Younger patients (less than 40 years of age) were found to have better scores compared to older age group (more than 40 years of age). Among those aged less than 40 years, 29%, 34% and 37% had poor, acceptable and good scores respectively compared to 46%, 34% and 20% had poor, acceptable and good scores respectively.

**Table No.2: Knowledge about the baseline blood glucose levels, risk factors and complications among diabetic**

Sr. No.	Knowledge question	Answer (%)	
		Yes	No
1.	Normal fasting blood sugar*	39	61
2.	Normal random blood sugar*	26	74
3.	Diabetes is raised blood sugar only	78	22
4.	The diabetes diet is a healthy diet for most people	26	74
5.	Urine testing and blood testing are both equally as good for testing the level of blood glucose	43	57
6.	Family members should be screened for diabetes	66	34
7.	Cigarette smoking is a risk factor for my health	85	15
8.	It is important to check serum lipids for a diabetic patient	28	72
9.	Unsweetened fruit juice raises blood glucose levels	14	86
10.	Cuts and abrasions in diabetes heal more slowly	70	30
11.	Medication is more important than diet and exercise to control my diabetes	53	47
12.	Diabetes is a disease which can affect any part of the body	62	38
13.	Diabetes can cause loss of feeling in my hands, fingers and feet	68	32
14.	Obesity does not increase the risk of complications in diabetes	46	54
15.	Exercise help in blood sugar control	73	27
16.	Wearing shoes a size bigger than usual helps prevent foot ulcers	18	82
17.	Eating foods lower in fat decreases your risk for heart disease	59	41
18.	It is important to consult ophthalmologist	36	64
19.	Diabetes can damage my kidneys	70	30
20.	If I am diabetic, my children have a higher chance of being diabetic	41	59

\*Proportion of participants giving correct values

Those who received diabetic education had better knowledge scores compared to those who did not

receive diabetic education. Among those who received diabetic education, 15% had poor knowledge, 31% acceptable and only 54% had good knowledge scores. In contrast, those who did not receive diabetic education, 70% had poor scores and only 18% and 12% had acceptable and good scores respectively.

## DISCUSSION

This study assessed the awareness of diabetic patients regarding target blood glucose levels and complications and care. Results of this showed that only a little more than one third of the participants know about the target fasting blood glucose levels while only near a quarter know about correct value of random blood glucose levels. Mean score of knowledge was 40% with males having better scores than females. There were differences in knowledge scores with respect to age, education status and exposure to diabetic education.

In this study I found that 39% of the participants had correct knowledge about the target fasting blood glucose levels. This proportion is higher than reported in another study from Karachi in which about 21% of the respondents had correct knowledge about the target fasting blood glucose levels<sup>13</sup>. Similarly higher proportion of participants had correct knowledge about target for the 2 hours postprandial blood sugar level than reported by previous study 26% compared to 8.7%<sup>13</sup>. Trend however is similar in both the studies that more people know about fasting blood glucose levels than random blood glucose. Another study from Rawalpindi Pakistan found that about 37.5% of the diabetics correctly identified normal blood glucose levels<sup>14</sup>. A similar study from Peshawar, Pakistan also reported lower proportion of diabetics having correct knowledge about target blood glucose levels<sup>15</sup>. This study reported that 17% and 12% patients had correct knowledge about fasting and random blood glucose levels respectively. These proportions are lower than reported in my study.

Mean score of knowledge in my study was 40% which is similar to a study conducted in Karachi where authors reported mean knowledge scores of 40%<sup>16</sup>. This similarity however should be interpreted cautiously as number of knowledge items is different in these two studies. In my study differences in mean scores with respect to genders was significantly different 50% for males compared to 30% for females. Other study from Karachi however did not find significant difference in mean knowledge score of males and females, 41% and 38% respectively<sup>16</sup>. Knowledge of patients regarding target blood glucose levels and risk factors is strongly linked with exposure to health education through various media and health care settings<sup>17</sup>. These can be changed with proper education and awareness programs can change the knowledge and attitudes of the people regarding diabetes<sup>18</sup>.

My study found that only one fourth 26% of the patients received diabetic education in clinics. This is percentage is lower than reported in other study from Karachi, which reported 38% of the patients received some diabetic education in clinics<sup>13</sup>. A similar study from Peshawar, Pakistan reported 45% of the patients had received some diabetic education<sup>15</sup>. This indicates lack of standardized practices regarding diabetic care in different health care facilities within same city and across different cities in Pakistan.

A study which was conducted at the Department of Medicine, Khyber Teaching Hospital Peshawar, Pakistan and used similar items in the tool found that knowledge of the patients were poor<sup>15</sup>. In this study 22% of the patients considered diabetes as raised blood sugar only compared to 78% in my study. Regarding the screening of family members this study reported 60% of the participants responded yes compared to my study in which 66% thought that family members should be screened. In this study, 70% of the patients considered smoking as a risk factor for their compared to 85% in my study. Regarding awareness about importance of check on serum lipids for diabetics, this study reported 42% of the participants responding yes compared to only 28% in my study. There was lower proportion of participants 26% believing diabetes can affect any part of the body compared to 62% in my study. Knowledge about the role of exercise in glycemic control was similar in two studies 75% compared to 73%. Similarly comparable proportion of participants from both studies 38% versus 36% considered it is important to consult an ophthalmologist. Differences in the level of awareness regarding same items in different parts of Pakistan may partly be attributed to differences in the levels of literacy and health consciousness. However there is no consistent pattern as for some the items participants from my study scored better while for other items respondents from Peshawar scored good. This could possibly be due to differences in quality of care provided in two parts of the country and lack standardize care practices in different health care setting in different cities within country<sup>19</sup>.

## CONCLUSION

This study found that there is low level of awareness among the patients attending diabetic outpatient clinics of NIDE. This indicates gaps in the patient care which needs attention. There is need to integrate patient education regarding glycemic targets, risk factors, complications and self-care as essential component of care through different channels of communication.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

## REFERENCES

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes estimates for the year 2000 and projections for 2030. *Diabetes care* 2004;27(5):1047-53.
2. Shera AS, Jawad F, Maqsood A. Prevalence of diabetes in Pakistan. *Diabetes Res Clin Prac* 2007;76(2):219-22.
3. Sheikh MZ. Diabetes mellitus: the continuing challenge. *J Coll Physicians Surg Pak* 2004;14: 63-4.
4. Zhang X, Geiss LS, Cheng YJ, Beckles GL, Gregg EW, Kahn HS. The Missed Patient With Diabetes How access to health care affects the detection of diabetes. *Diabetes Care* 2008;31(9):1748-53.
5. Brandle M, Zhou H, Smith BRK, Marriott D, Burke R, Tabaei BP, et al. The direct medical cost of type 2 diabetes. *Diabetes care* 2003;26(8): 2300-4.
6. Kirigia JM, Sambo HB, Sambo LG, Barry SP. Economic burden of diabetes mellitus in the WHO African region. *BMC Int Health Human Rights* 2009;9(1):1.
7. Johnson ST, Bell GJ, McCargar LJ, Welsh RS, Bell RC. Improved cardiovascular health following a progressive walking and dietary intervention for type 2 diabetes. *Diabetes, Obesity and Metabolism* 2009;11(9):836-43.
8. Gutschall MD, Miller CK, Mitchell DC, Lawrence FR. A randomized behavioural trial targeting glycaemic index improves dietary, weight and metabolic outcomes in patients with type 2 diabetes. *Public Health Nutri* 2009;12(10):1846-54.
9. Funnell MM, Brown TL, Childs BP, Haas LB, Hoseney GM, Jensen B, et al. National standards for diabetes self-management education. *Diabetes Care* 2009;32(Supplement 1):S87-S94.
10. American Diabetes Association. Standards of medical care in diabetes: 2009. *Diabetes care*. 2009;32(Suppl 1):S13.
11. Hakeem R, Fawwad A. Diabetes in Pakistan: Epidemiology, determinants and prevention. *J Diabetol* 2010;3(4).
12. Jabbar A, Hameed A, Chawla R, Akhter J. How well do Pakistani patients and physicians adhere to standards of diabetes care. *Int J Diab Dev Ctries* 2007;27(3):93-6.
13. Rafique G, Azam SI, White F. Diabetes knowledge, beliefs and practices among people with diabetes attending a university hospital in Karachi, Pakistan. 2006.

14. Habib SS, Aslam M. Risk factors, knowledge and health status in diabetic patients. Saudi Med J 2003;24(11):1219-24.
15. Gul N. Knowledge, attitudes and practices of type 2 diabetic patients. J Ayub Med Coll Abbottabad 2010;22(3):128-31.
16. Jabbar AZ, Ebrahim MA, Mahmood K. Standard of knowledge about their disease among patients with diabetes in Karachi, Pakistan. JPMA 2001;51(216):216.
17. Nam S, Chesla C, Stotts NA, Kroon L, Janson SL. Barriers to diabetes management: patient and provider factors. Diabetes Res Clin Prac 2011; 93(1):1-9.
18. Badruddin N, Basit A, Hydrie MZI, Hakeem R. Knowledge, attitude and practices of patients visiting a diabetes care unit. Pak J Nutr 2002; 1(2):99-102.
19. Gomes MIB, Cobas RA, Matheus AS, Tannus LR, Negrato CA, Rodacki M, et al. Regional differences in clinical care among patients with type 1 diabetes in Brazil: Brazilian Type 1 Diabetes Study Group. Diabetol Metabolic Syndrome 2012;4(1):1-12.