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Original Article

Awareness regarding complications of type II diabetes mellitus among diabetics in Karachi, Pakistan

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Abstract

Background: Research shows that people with diabetes have an astonishingly low level of awareness about diabetes, its related complications and management. The aim of our study was to assess the knowledge of diabetics regarding complications of Diabetes Mellitus Type II. This will help us identify knowledge amongst patients regarding their long-term illness.

Methodology: A cross-sectional study was conducted over a time span of two years in all three Ziauddin Hospitals in Karachi, Pakistan. Both male and female patients diagnosed with Diabetes Mellitus Type II aged 30 years and above were included in the study. Those suffering from Diabetes Mellitus type I, Diabetes Insipidus, and Gestational Diabetes were excluded. A sample size (n) of 151 was calculated, with the assumption that the prevalence of Diabetes Mellitus in Pakistan is 11%. Data was analyzed using SPSS 20.0. Chi-square test was applied to present association between study variables.

Results: Out of the total 157 subjects with diabetes, 83 (53.3%) were males and 74 (46.5%) were females with a mean age of 53.8±11.9 years. 77.7% of patients were having cardiac disease awareness (p=0.042), and 60.5% of participants were aware of eye problems (p=0.016). Only 33.1% of patients were aware of stroke as a potential complication (p=0.05). Furthermore, awareness of nerve weakness was 40.8% (p=0.355) and kidney problems were 54.8% (p=0.019).

Conclusion: Diabetic patients included in this study were aware of most of the complications of diabetes and a significant difference was found in those patients who had personally experienced these complications.

Keywords

Knowledge, Diabetic Awareness, Diabetes Management, Diabetic Complications, Pakistan

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Introduction

Diabetes is one of the most common non-communicable global disease and the fourth leading cause of death in the world[1&2]. More than 170 million people worldwide have diabetes. If the current trend continues, this figure will be more than double across the globe[2]. The prevalence of diabetes in Pakistan is increasing greatly[3]. The prevalence of diabetes in Pakistan ranged from 7.6-11% of the total population[4]. However, according to the National Diabetes Survey of Pakistan, the overall prevalence of diabetes has increased to 26.3%, of which 19.2% had known diabetes and 7.1% were newly diagnosed people with diabetes[5]. It is predicted that by 2030, there will be a 67% increase in the prevalence of diabetes[5]. Infamously known as "the silent killer", most common complications include foot infections, chronic skin infections, vision problems/blindness, heart disease and blood circulation problems and chronic kidney failure[6].

Research shows that people with diabetes have an astonishingly low level of awareness about diabetes, its related complications and management[1]. In low socioeconomic countries prevention of diabetes through awareness and education of the community is the most cost-effective management of diabetes and its related complications. Timely treatment of diabetes and regular screening for complications can reduce the complications of diabetes by as much as 50%[7]. In order to create awareness in the community, insight into the gaps of knowledge about diabetes is important.

A pilot study conducted in Shifa Hospital, Islamabad surveyed 40 diabetic patients of which 75% of patients presented with one or more diabetic complications[8]. This study revealed a low awareness level of the participants i.e. less than 50% had knowledge about the complications of diabetes such as heart attack, stroke, and eye and foot complications[8]. Another study in the city of Larkana, only 21% of patients were aware of retinopathy as a diabetic complication[6].

Due to the high burden of poverty-stricken and uneducated Pakistani population, the objective of our research was to assess the knowledge of people with diabetes in Karachi, Pakistan. The assessment of knowledge and awareness amongst diabetic patients will help physicians understand where patients lack knowledge about their disease. Therefore, patients can be better educated about the long-term consequences that they may face due to diabetes. This effort will enhance their quality of life by stressing the value of regular follow-ups, timely medication and recognizing early onset symptoms, therefore, decreasing diabetes-related mortality. Furthermore, causing significant ease for the patients from an economic standpoint as proven by current statistics explained by the "Finland Program of Diabetes Prevention" that as diabetic complications often require expensive inpatient care, these complications can cause 24-fold and 12-fold increases in the care costs of type II diabetes and type I diabetes respectively[9].

Therefore the objective of our research was to determine the level of knowledge and awareness among Pakistani diabetic patients in the city of Karachi, about the various complications they may potentially suffer.

Methodology

This cross-sectional study was conducted from 2011 to 2013 in three hospitals in Karachi, Pakistan including Ziauddin Clifton Hospital, Ziauddin Kemari Hospital, and Ziauddin North Nazimabad Hospital. A sample size of 157 was calculated taking prevalence of Diabetes Mellitus in Pakistan as 11% and then using a sample size estimation calculator with a 95% confidence level and precision as 0.05[10&11].

Both male and female patients diagnosed with Diabetes Mellitus type II of 30 years of age or above were included in the study. Those who were suffering from Diabetes Mellitus type I, Diabetes Insipidus, and Gestational Diabetes were excluded from the study sample.

Non-probability, purposive sampling technique was used to choose patients at random regardless of their reason for being hospitalized. Informed verbal consent was obtained from all those who participated in the study. A structured questionnaire was developed and data was collected via interviews. The questionnaire was designed to determine awareness of different complications that commonly occur over time due to diabetes as well as to seek a correlation of awareness with socioeconomic status, educational status, age and gender. Data was analyzed using SPSS version 20.0. Frequency and percentages were used to denote study variables and the association was evaluated by means of Chi-square test.

Results

The total sample size was 157 diabetics consisting of 83 males (53.3%) and 74 females (46.5%) The majority of our sample, 45.9% of the group was educated from primary to intermediate while 31.8% were uneducated. Most patients were from a low-income household, 23%. While middle-income background came in second with 11% and high income of 6.4%. About 46.5% of patients had been diagnosed with diabetes mellitus type 2 for the past 1-5 years. Majority of patients were diagnosed with diabetes by a physician (56.7%) and 70.1% of patients say they were first diagnosed by a General Physician by blood sugar tests in 76.4% of the time.

Table 1: Demographic details of the sample diabetic patient

Time since diagnosis	n(%)
<1 year	23 (14.6)
1-5 years	73 (46.5)
6-10 years	38 (24.2)
>10 years	23 (14.6)
Education Status	
Educated (Primary to intermediate)	74 (46.9)
No education	51 (32.8)
Religious Studies	8 (5)
Diabetes was noticed by	
By patient him/herself	48 (30.6)
By friends or family	20 (12.7)
By physician	89 (56.7)
First diagnosed by	
General Practitioner	110 (70.1)
Cardiologist	18 (11.5)
Endocrinologist	27 (17.2)
Dentist	1 (0.6)
Gynecologist	1 (0.6)
Diagnosis confirmation via	
Signs and symptoms	23 (14.6)
Blood sugar levels	120 (76.4)
Urine DR	69 (43.9)

*n=frequency

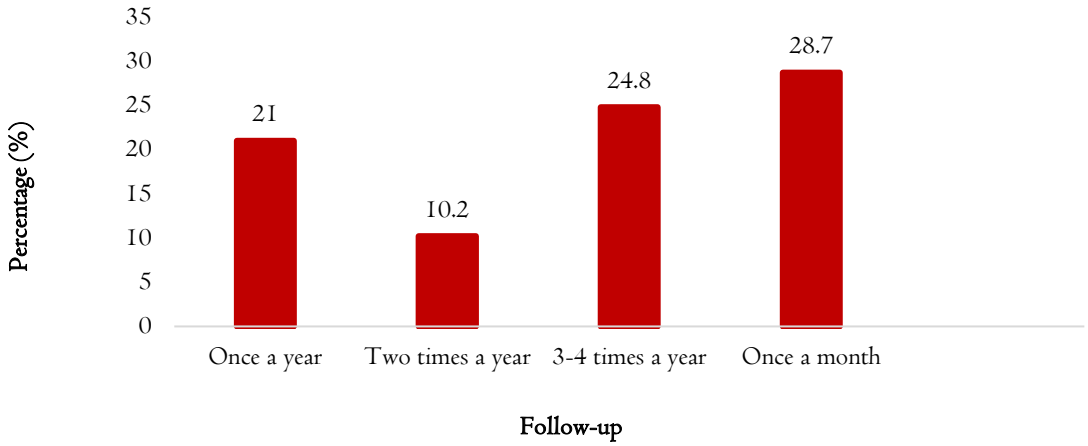

Figure 1: Follow up check-ups to physician

About 28.7% patient's follow-up monthly, 24.8% follow-up 3-4 times a year and only 21% follow-up once a year. (Figure 1). A surprising turn in our research was that many diabetic patients regularly follow-up with their doctor 62.4% (p= 0.006).

According to the study results, the most common professional to which the 33.8% participants visited for follow-up was their General Practitioner coming in a close second, 33.1% of patients went to endocrinologist for follow-ups. An alarming finding was that only 4.5% of patients checked their sugar levels daily. 12.7% of patients checked it weekly. 35.0% monthly and 34.4% patients checked it 3-4 times a year (Table 2). The survey also focused on prevention measurements taken by diabetic patients. Besides regular follow-up, eye care 54.8% (p=0.034) and foot care 52.9% (p=0.023) were carefully followed by most patients. 80.3% of patients (p=0.717) also claimed to take their medications regularly.

Table 2: Management and follow-ups by study subjects

	n(%)
Regular follow up check ups	98 (62.4)*
Taking medicines regularly to control diabetes	126 (80.3)
Preferred Healthcare professional (for follow up checkups)	
General practitioner	53 (33.8)
Nurse	9 (0.6)
Endocrinologist	52 (33.1)
Cardiologist	2 (1.3)
Frequency of checking blood sugar levels	
Daily	7 (4.5)
Weekly	20 (12.7)
Monthly	55 (35.0)
3-4 times a year	54 (34.4)
Eye care	
Ever had eye examination	86 (54.8)*
Last visit (within one year)	13 (0.8)
Foot care	83 (52.9)*
Medication	

Alternative medicine	29 (18.5)
Homeopathic	5 (3.2)
Herbal	9 (5.7)
Others	15 (9.6)
Follow Diet Plan/Lifestyle modifications	46 (29.4)

*p-value significant

In terms of how many complications they were aware of, 77.7% of patients knew that diabetes leads to cardiac problems (p=0.042). 60.5 % of patients were aware of eye problems (p=0.016). Both cardiac problems and eye problems also had a higher incidence of personal experience by the patients. Only 33.1% of patients were aware of stroke as a potential complication (p=0.05). Nerve weakness 40.8% (p=0.000) and kidney problems 54.8% (p=0.000).

Table 3: Awareness of Specific Diabetic Complications

Diabetic Complications	Study subjects aware of Complication		Study subjects that personally suffered from Complication	
	n(%)	P-Value	n(%)	P-Value
Cardiac Problems	120 (77.7)	0.000	34 (21.7)	0.042
Stroke	52 (33.1)	0.000	6 (3.8)	0.05
Eye Problems	95 (60.5)	0.000	32 (20.4)	0.016
Nerve Weakness	64 (40.8)	0.000	8 (5.1)	0.355
Kidney Problems	86 (54.8)	0.000	11 (7)	0.019
Amputation	57 (36.3)	0.000	3 (1.9)	0.025
Diabetic Coma	54 (34.4)	0.000	1 (0.6)	0.051

*p-value significant

Discussion

As the prevalence of Type II diabetes is increasing in Pakistan, there is a dire need to educate the population about the disease[12]. Education is essential for patients to be capable of identifying risk factors to minimize complications and eventually reducing the load on health care facilities. Our study aimed to evaluate basic knowledge of diabetics in Karachi regarding various common complications.

Against expectations, our study results showed that over 77% of diabetics were aware of the cardiac complications of type 2 diabetes mellitus (Table 3). In contrast to the results depicted by previous studies in Pakistan[6&13]. The study conducted in Shifa Hospital (Karachi) by MM Alam et al found that only 52.5% of the patients had knowledge regarding cardiac complications[6]. Similarly, other published studies also showed that more than two-thirds of diabetes patients are unaware that cardiovascular disease can be a severe complication of diabetes[14]. Furthermore, our study showed that 60.5% of patients were aware of blindness/ retinopathy as a possible complication (Table 3). This was the second most commonly known complication known by our study population. Unfortunately, only a small percentage, less than 50% of participants had knowledge of the other complications that were questioned such as nerve weakness/neuropathy, diabetic coma, stroke and amputation (Table 3).

The current study showed that 62.4% of patients visited their practitioner for follow-up (Table 2). Despite the high number of patients that frequently visited their doctor, it was found that 21% of patients still do not go for a routine check-up (every six months) as recommended by the NICE guidelines[8]. It states that twice a year follow-ups have proven to help greatly in controlling long term Random Blood Sugar (RBS) levels and HBa1c, therefore, preventing long term complications[15]. According to a study conducted in Karachi, Pakistan by Jabbar et al., diabetic patients who went for routine follow-ups at their respective diabetic clinics had greater knowledge overall, even in regard to questions related to nutrition and target blood glucose levels[16].

It was further observed that there are still misconceptions among the population about diet management in diabetes patients. Only 29.4% of patients claim to have been suggested a diet plan/lifestyle modification by their physician (Table 2). However, unfortunately, 71% of our patients were not provided with any lifestyle modification. Latest UK-based nutrition guidelines for people with diabetes recommend, reduction in total and saturated fat intake, increase fiber intake and increasing physical activity[17].

Recent studies have proven that monitoring blood glucose levels multiple times a day can help manage diabetes effectively[18]. This allows physicians to get a better picture of what time of the day blood glucose levels rise and fall and therefore the management can be changed accordingly. In our study, only 7% of the patient population measure their blood sugar levels daily while most patients in our study only monitor their blood glucose levels once a month (Table 2). Karter et al., proved that self-monitoring among diabetic patients was associated with lower HbA1c levels[18]. Those diabetic patients that self-monitor themselves more than three times a day daily had lower HbA1c levels (1.0 percent lower in type 1 and 0.6 percent lower in type 2) as compared to less frequent monitoring ($P<0.0001$)[18]. Furthermore, a clinical study in Germany by Schutt et al., proved similar benefits of self-monitoring blood glucose multiple times a day[19].

Our study proved that majority of patients were aware of 2-3 most common complications due to diabetes (Table 3). A major factor to this result could be because our study was focused in three private hospitals in Karachi, Pakistan which is a developed and densely populated city. This concept can be further proven by one cross-sectional study by Ulvi et al., which compared population in rural vs urban Pakistan. They concluded that type 2 diabetic patients who lived in urban areas had more knowledge as compared to patients that reside in rural areas most likely due to accessibility to well-trained doctors and therefore higher quality care[20&21].

Despite of the fact that the study presented positive outcomes, our study holds certain limitations. Due to lack of facility and manpower, our study circle was limited to three tertiary care hospitals in Karachi, Pakistan which are considered higher-tier. Therefore, the patient population that was surveyed could be a lack of representation to make general statements about the citizens of Karachi. Getting the opportunity to survey in more underserved hospitals throughout the city may have affected our results. A crucial limitation in our study was the lack of awareness of these potential complications in the physicians themselves. Physicians should be properly trained on how to convey the awareness of the complications of diabetes to their patients. A possible approach may be to create

awareness camps or use telemarketing/social media to approach and educate the masses with facts.

Conclusion

Diabetic patients included in this study were aware of the complications of diabetes. Those who personally suffered from these complications had more knowledge. Complications of diabetes are very frequent, thus there is a need to educate diabetic patients regarding complications and the control of diabetes. The patients should be properly guided as to what precautionary measures they must take once they are diagnosed with diabetes mellitus. Compliance with medications should be highly encouraged, and frequent check-ups with general practitioners can help prevent diabetic complications at an early stage. Physicians should have a strong standardized clinical practice in OPDs to recommend lifestyle modifications. For this to be effective, as mentioned earlier, physicians must be properly trained to convey the correlation between diabetes and its associated complications.

Conflicts of Interest

None.

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References

1. Khan I, Gaohar QY, Baig A, Khan FA. Level of awareness regarding diabetes and its management in diabetic population of Pakistan, and highlighting the role of consultant pharmacist. J Pak Med Assoc. 2014; 64(5):574-575.
2. Sicree, Richard, Johnathan Shaw, and Paul Zimmett. "Diabetes and Impaired Glucose Tolerance." IDF Diabetes Atlas 4 (n.d.): n. pag. Web. 27 July 2012. Available from: http://http://www.idf.org/sites/default/files/The_Global_Burden.pdf.
3. Country and regional data on diabetes. World Health Organization. World Health Organization; 2011 [cited 2018Dec3]. Available from: https://www.who.int/diabetes/facts/world_figures/en/index2.html
4. Obirikorang Y, Obirikorang C, Anto EO. Knowledge of complications of diabetes mellitus among patients visiting the diabetes clinic at Sampa Government Hospital, Ghana: a descriptive study. BMC Public Health. 2016; 16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4960830/
5. Basit A, Fawwad A, Qureshi H, Shera AS. Prevalence of diabetes, pre-diabetes and associated risk factors: second National Diabetes Survey of Pakistan (NDSP), 2016–2017. BMJ open. 2018; 8(8): e020961.
6. Chhutto MA. Awareness of Diabetes Mellitus and Its Complications in Diabetic Patients. Medical Channel 15.4. 2009; 153-156.
7. Shera AS, Jawad F, Basit A. Diabetes related knowledge, attitude and practices of family physicians in Pakistan. J Pak Med Assoc. 2002; 52: 465-470.
8. Type 2 diabetes: The management of type 2 diabetes. Guidance and guidelines | NICE. [cited 2018Feb2]. Available from: http://www.nice.org.uk/guidance/cg87/resources/guidance-type-2-diabetes-pdf
9. Saaristo T, Moilanen L, Korpi-Hyövälti E, et al. Lifestyle intervention for prevention of type 2 diabetes in primary

health care: one-year follow-up of the Finnish National Diabetes Prevention Program (FIN-D2D). Diabetes Care. 2010; 33:2146–2151

10. Hakeem R, Fawwad A. Diabetes in Pakistan: epidemiology, determinants and prevention. J Diabetology. 2010; 1(3):3.
11. Charan J, Biswas T. How to calculate sample size for different study designs in medical research?. Indian J Psychol Med. 2013; 35(2):121-126.
12. "WHO Ranks Pakistan 7th on Diabetes Prevalence List." The Nation. N.p., n.d. Web. 06 Aug. 2012. Available from: http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/karachi/15-Nov-2008/WHO-ranks-Pakistan-7th-on-diabetes-prevalence-list.
13. Adeel, Malik M., Ali Y. Alam, and Tara Jaffrey. "Knowledge of Type 2 Diabetic Patients about Their Illness: Pilot Project." J Pak Med Assoc. 2005; 55(5):221-224.
14. Merz CN, Buse JB, Tuncer D, Twillman GB. Physician attitudes and practices and patient awareness of the cardiovascular complications of diabetes. J Am Coll Cardiol. 2002; 40(10):1877-1881.
15. Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. The Diabetes Control and Complications Trial Research Group. N Engl J Med. 1993; 329(14):977-986.
16. Jabbar A, Contractor Z, Ebrahim MA, Mahmood K. Standard of knowledge among patients with diabetes in Karachi, Pakistan. J Pak Med Assoc. 2001; 51: 216-218.
17. Dyson PA, Twenefour D, Breen C, Duncan A, Elvin E, Goff L, Hill A, Kalsi P, Marsland N, McArdle P, Mellor D. Diabetes UK evidence-based nutrition guidelines for the prevention and management of diabetes. Diabetic Medicine. 2018; 35(5):541-547.
18. Karter AJ, Ackerson LM, Darbinian JA, D'Agostino Jr RB, Ferrara A, Liu J, Selby JV. Self-monitoring of blood glucose levels and glycemic control: the Northern California Kaiser Permanente Diabetes registry. Am J Med. 2001; 111(1):1-9.
19. Schütt M, Kern W, Krause U, Busch P, Dapp A, Grziwotz R, Mayer I, Rosenbauer J, Wagner C, Zimmermann A, Kerner W. Is the frequency of self-monitoring of blood glucose related to long-term metabolic control? Multicenter analysis including 24500 patients from 191 centers in Germany and Austria. Exp Clin Endocrinol Diabetes. 2006; 114(07):384-388.
20. Irshad M, Khan I, Khan FA, Baig A, Gaohar QY. A Survey of Awareness Regarding Diabetes and Its Management among Patients with Diabetes in Peshawar, Pakistan. JPMI. 2015; 28(4).
21. Ulvi OS, Chaudhary RY, Ali T, Alvi RA, Khan MF, Khan M, Malik FA, Mushtaq M, Sarwar A, Shahid T, Tahir N. Investigating the awareness level about diabetes mellitus and associated factors in Tarlai (rural Islamabad). J Pak Med Assoc. 2009; 59(11):798-801.