



## **Awareness and Lifestyle Practices among Type-II Diabetics Pertaining to the Disease Attended at Outpatient Clinics of Nawabshah, Shaheed Benazirabad**

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### **Authors' contributions**

*This work was done in collaboration among all the authors. Authors RS and SM conceptualized the work and authors RS, SM and YQ designed the study and Authors UURM, MAG, JA supervised by the study. Authors JJ, SHL provided resources for the study and author TK designed the materials.*

*Authors RS and YQ participated in the data collection. Author ZM did the data analysis and interpretation. Authors SHL, JJ carried out the literature searches and authors RS, SM, TK writing of manuscript. Authors UURM, MAG managed critical reviews. All authors read and approved the final manuscript.*

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## ABSTRACT

Diabetes is a disorder that affects metabolism of carbohydrates, fats, and proteins. It has appeared as one of the deadliest pandemics causing 3.2 million deaths per year. The objective of current study was to assess the level of awareness and practice of diabetic patients who were diagnosed with Type-II diabetes mellitus (DM). A prospective, observational study was designed, and subjects of the study were the patients visiting the clinics of Nawabshah Shaheed Benazirabad. The study was conducted from September 2019 to February 2020 among 300 Type-II DM patients with minimum of 34 years of age, who had been diagnosed according to the set criteria of World Health Organization (WHO). The criteria for the sampling were set to be done by non-probability convenient sampling technique. For the collection of the data, diabetes knowledge questionnaire was used, and SPSS 25 software was used for the analysis of the collected data. The statistical analysis generated was descriptive in nature. Majority of participants were male patients (n=158, 52.7%) and major age group was >65 (n=136, 45.33%). The patients with family history of the disease were 253 (84.3%) of the total cases. The patients having poor knowledge of the disease and those with satisfactory practice and routine follow up were 207 (69.0%) and 160 (53.3%) respectively. The results show that the patients had poor knowledge of the diabetes. The practice regarding diabetes falls under the category of average routine practice. It can be concluded from the results that for the awareness of the diabetes there should be arrangements of the campaigns for the general population and with the involvement of the clinical pharmacist and endocrinologist, and by that diabetes could be managed effectively.

*Keywords: Type-II diabetes mellitus; knowledge; practice; awareness.*

## 1. INTRODUCTION

Globally, the prevalence of Diabetes Mellitus (DM) is alarming and increasing rapidly, especially in the Middle east and South Asia. With increasing complications, it is emerging as a public health concern [1]. Diabetes mellitus is one of the most problematic conditions across the globe. It is affecting 450 million people throughout the world and it is estimated that by the year 2040 this figure will reach up to 629 million [2].

This chronic hyperglycemic disorder, if not managed for a longer period and if remains undetected and out of control, can lead to complications such as neuropathy, retinopathy kidney failure, high risk of stroke and heart disease. The reasons for the undetected and uncontrolled disease would be either appearance of the symptoms after certain period of time, or the patients lacking the disease knowledge [3].

The effects of diabetes are well known by the healthcare experts and strategy makers that how could the situation affect the public health. Due to the silent characteristic of the disease, the patients would not come to know until and unless they will experience the major complication of the disease [4]. The factors such as inadequate medications prescribed, the patient having poor

or no knowledge of the disease at all, are the reasons behind the poor glycaemic control as evidenced by the studies [5-7]. The early diagnosis of the disease by increasing the awareness of diabetes among the patients, would not only decrease the burden of the disease but the complications of diabetes can also be controlled by the suitable treatment [8].

Worldwide, there is a big gap between the awareness of the disease and what attitudes are adapted by the patients to overcome it. As by taking example of the Chinese people, there is positive attitude for the disease but at the same time, the knowledge and practice about the nutrition is poor. So, for the improvement of the nutritional knowledge and practices, the education regarding both aspects was given, which helped them to effectively control their level of glucose in the blood [9].

If there is knowledge regarding the disease along with awareness as reported by some studies there will be less chances of patient non-compliance and positive health outcomes can be achieved by the early diagnosis and appropriate treatment [10,11]. The burden of the disease would be reduced and this is possible with the improved disease awareness, that will play a vital role for the management of disease and also to reduce disease related complications [8].

The individual's ability to practice self-care in daily routine, is the factor on which the management of diabetes is dependent. So, for the management of disease for a longer period of time, patient education plays a pivotal role [12]. For the comprehensive care and management of diabetes the essential factor that will lead to effective control of the disease is education that will lead to knowledge improvement, skills and attitudes towards management of the disease [13].

According to International Diabetes Federation (IDF) among the top countries Pakistan is ranked at 10<sup>th</sup> in 2017 with 7.5 million (5.3-10.9) cases. It is estimated that by 2045 this figure will reach to 16.1 million (11.5-23.2). For health care providers and policy makers this is a challenging condition to be controlled in Pakistan [13]. As the increase in number of this prevalent disease is predictable, hence prescribing anti-diabetic drugs, mortality and morbidity of the condition is thought to be increasing in areas where there are chances of population expansion and those where although health care systems are present but are not well established [14]. The above-mentioned factors are the reasons, for carrying out this study which focus on determining the awareness of diabetic patients about their disease in the city of Nawabshah Shaheed Benazirabad.

## 2. MATERIALS AND METHODS

### 2.1 Design

The prospective, cross-sectional observational study was performed among 300 Type-II DM patients.

### 2.2 Setting

The participants included in this study were those who had previously been diagnosed with Type-II DM and were coming to the clinics for the follow up. The patients were attending various private clinics of Nawabshah, Shaheed Benazirabad. Nawabshah is a city in the district Shaheed Benazirabad of Sindh province, Pakistan. Shaheed Benazirabad is geographically central district of Sindh and serve as a hub for the surrounding districts because of its healthcare facilities.

### 2.3 Study Population

The participants who routinely visited the several outpatient clinic settings, with a total figure of

300, were enrolled in a random manner for the study, from September 2019 to February 2020. According to the set criteria of World Health Organization (WHO), patients with minimum of 34 years of age, who had been diagnosed at least 6 months prior to the study with Type-II DM and had given the consent were enrolled in the study. The excluded subjects were those, who did not agree to participate in the study, or were Type-I diabetic patients, or the age of those subjects was less than 34 years.

### 2.4 Data Collection

The diabetes knowledge questionnaire (DKQ) having 29-items was used in this study. The source of adaption of the questionnaire was the study by Eva Menino G et al. 2017 (Validation of DKQ) [15]. For the present research, the modification in the DKQ was made. The questionnaire was also translated to local languages (Sindhi and Urdu). Type-II DM patients themselves completed the questionnaire regarding their conditions but some were completed by the researcher through the interview mode for the patients who were not educated. The response was recorded in the DKQ by the researcher after the translation and explanation of the questionnaire in the local language of the area in front of the participants. The questionnaire was divided into 3 sections, Section A, B and C having 10, 10 and 9 items, respectively. The sections A, B, and C contain items regarding demographic and anthropometric data (i.e., weight and height), awareness of patients about the disease, and lifestyle and practice of patient, respectively. Confidentiality and anonymity of the participants were maintained during and after the study.

### 2.5 Data Analysis

When the DKQs were completed, for the analysis of the data, excel sheets were prepared. For each section, a scoring system was developed by the investigators. In the section B, the diabetes awareness section, the 0 score was designed for the unanswered or incorrect answer and 1 score for each correct answer, and 3 categories were developed according to each patient's score. Ten (10) was the total score set for this section, whereas  $\leq 4$ , 5-7,  $\geq 8$  score was set for poor knowledge, moderate knowledge, and good knowledge, respectively.

Similarly, in section C, for the assessment of the practice among the diabetic patients, 9 items

were included. The practice questions were given the scores of 1,2,3, and 4, for the categories: never, sometimes, often, and always, respectively. The total practice score set was 36 and categorized as  $\leq 12$ , 12-24 and  $\geq 24$  for poor, satisfactory and good practice, respectively. The SPSS version 25 was used for the analysis of data. The percentages and proportions were calculated as descriptive statistics.

### 3. RESULTS

During the study responses were received from 300 patients and among them 158 (57.7%) are male whereas 142 (47.3%) are females. Basic characters including gender, age, educational

status, employment status, residential status, BMI, duration of disease, mode of diagnosis and treatment taken by the patients are shown in Table 1.

To determine the level of awareness of patients regarding their disease (diabetes) ten questions were asked. About 207 (69%) patients had poor knowledge, 65 (21.66%) have moderate knowledge whereas 28 (9.33%) had good knowledge concerning their disease. The mean score was 2.4, that falls in category of 'poor knowledge'. Responses of patients to questions asked about their awareness regarding the disease are shown below in the Table 2.

**Table 1. Demographics of the study participants**

Characteristics	Groups	Frequency (n)	Percentage
<b>Gender</b>	Male	158	52.7%
	Female	142	47.3%
<b>Age Group</b>	34-43	32	10.7%
	44-54	56	18.7%
	54-64	76	25.3%
	>65	136	45.3%
<b>Educational Status</b>	Illiterate	60	20.0%
	Metric and below	80	26.7%
	Intermediate	49	16.3%
	Graduation	57	19.0%
	Master and above	54	18.0%
<b>Residential Status</b>	Rural	178	59.3%
	Urban	122	40.7%
<b>BMI</b>	Underweight	20	6.7%
	Normal weight	59	19.7%
	Overweight	123	41.0%
	Obese	98	32.7%
<b>Mode of Diagnosis</b>	Incidental	171	57.0%
	Symptomatic	129	43.0%
<b>Employment Status</b>	Never worked	66	22.0%
	Full time	58	19.3%
	Part time	39	13.0%
	Retired	137	45.7%
<b>Treatment</b>	Non-pharmacological	17	5.7%
	Oral hypoglycaemic agents	124	41.3%
	Insulin	14	4.7%
	Both OHAs and insulin	145	48.3%
<b>Family History of DM</b>	Present	253	84.3%
	Not present	47	15.7%
<b>Duration of DM</b>	<1 yr	67	22.3%
	2-6 yr	89	29.7%
	7-11 yr	86	28.7%
	>11 yr	58	19.3%

DM: Diabetes Mellitus

OHA: Oral Hypoglycaemic Agents

**Table 2. Awareness of patients about their disease**

<b>Questions</b>		<b>Correct responses n (%)</b>	<b>Wrong responses n (%)</b>
1.	Eating too much sweet food is reason of diabetes.	87 (29.0%)	213 (71.0%)
2.	The deficiency of effective insulin in the body is the cause of diabetes.	32 (10.7%)	268 (89.3%)
3.	In untreated diabetic patients, the quantity of sugar in the blood generally increases.	196 (65.7%)	104 (34.7%)
4.	Children of diabetic patients have higher likelihood of becoming diabetic	81 (27.0%)	219 (73.0%)
5.	Having 210 fasting blood sugar level is considered too high.	32 (10.7%)	268 (89.3%)
6.	Testing urine is the best way to check diabetes	37 (12.3%)	263 (87.6%)
7.	Regular exercise increases the demand for insulin or other diabetic medications	58 (19.3%)	242 (80.6%)
8.	Loss of feeling in hands, fingers, and feet is caused by diabetes	145 (48.3%)	155 (51.6%)
9.	High blood sugar level is linked with shaking and sweating.	185 (61.6%)	115 (38.3%)
10.	Low sugar level is linked with frequent urination and thirst	178 (59.3%)	122 (40.6%)

**Table 3. Lifestyle and practice of patient**

<b>Questions</b>		<b>Always n (%)</b>	<b>Often n (%)</b>	<b>Sometimes n (%)</b>	<b>Never n (%)</b>
1.	Do you go for routine check-up?	135 (45.0%)	88 (29.3%)	69 (23.0%)	8 (2.7%)
2.	Are you monitoring your sugar level?	54 (18.0%)	45 (15.0%)	78 (26.0%)	123 (41.0%)
3.	Do you use glucometer?	51 (17.0%)	9 (3.0%)	99 (33.0%)	141 (47.0%)
4.	Are you monitoring your blood pressure?	60 (20.0%)	80 (26.7%)	105 (35.0%)	55 (18.3%)
5.	Are you stuck to any special diet?	120 (40.0%)	37 (12.3%)	113(37.7%)	30 (10.3%)
6.	Do you eat fruits?	110 (36.7%)	116 (38.7%)	58 (19.3%)	16 (5.3%)
7.	Do you smoke or drink?	92 (30.7%)	23 (7.7%)	40 (13.3%)	145 (48.3%)
8.	Do you take care of your feet?	104 (34.7%)	15 (5.0%)	31 (10.3%)	150 (50.0%)
9.	Do you take exercise?	105 (35.0%)	54 (18.0%)	27 (9.0%)	114 (38.0%)

To evaluate the lifestyle practices of patients regarding their disease nine questions were asked from the patients. Most of the patients (n=160, 53.3%) had satisfactory practice and 45.0% (n=135) patients had regular routine follow up. Moreover, about half of the patients (n=47, 15.66%) had poor practice while 93 (31%) had good practice. Majority of the participants of the study did not check their blood sugar level (n=123, 41.0%) while 55 (18.3%) did not check their blood pressure regularly. Furthermore, only 120 (40.0%) patients followed a dietary plan and 150 (50.0%) patients said they do not take care of their feet. Responses of practice questions are given in Table 3.

#### 4. DISCUSSION

Diabetes has emerged as one of the fatal pandemics causing 3.2 million deaths per year. It is a condition which affects the metabolism of carbohydrates, proteins, and fat [16]. Insulin development and importance of patient counselling are the major achievements of 21<sup>st</sup> century [17]. Diabetes outcome of patients depends primarily on the level of knowledge of the disease, which includes healthy activities and care-seeking that is determined by individual and cultural beliefs about health, illness, and healthcare [18]. It is stated that patients having a low level of knowledge regarding diabetes are least expected to follow given instructions from health-care providers regarding diabetes management [19]. American Association of Clinical Endocrinologists has described the significance of lifestyle changes, self-care and knowledge of people living with diabetes [20]. In rural areas of Sindh proper guidance regarding diabetes care is lacking which ultimately leads to poor knowledge and practice in diabetic patients. Keeping this in mind, we started to evaluate the patient's awareness and practices to cope up with their condition and how they manage glycaemic levels near normal to avoid comorbidities.

Among study population, majority of the patients 158 (52.7%) are male. Furthermore, about half of our study population (n=136, 45.3%) patients were in age group of >65 years which shows a link with the fact that after the age of 40 years this disease can occur commonly [21]. We observed in our study that 60 patients (20.0%) were illiterate, 49 (16.33%) of the participants had education up to intermediate grade while 80 (26.7%) had completed matric. Results of this

study show that patients had poor knowledge of the disease and had a lower level of education which has effect on diabetes knowledge. It is similar to the indication in an earlier study which shows that low literacy and health literacy often leads to poor knowledge scores and suggested that better self-awareness, better compliance, and better outcomes can be accomplished with high literacy rate [22].

Positive family history of diabetes was observed in majority of the participants (n=253, 84.3%) whereas in a study conducted by Al-Maskari and associates in United Arab Emirates (UAE) had given a figure of 64.4% of positive family history which is a lot less than the current study population [23]. Furthermore, in the findings of our study the people living with diabetes had poor knowledge and satisfactory practices which is comparable with the findings of the studies conducted in Zimbabwe and Bangladesh [24,25] while opposing to study conducted in India [26]. Similar kind of study was done in Ghana to observe the knowledge on DM management and practice, in which it was found that >50% participants were capable to identify frequent urination and thirst as indicators of high blood sugar while in our study 178 participants (59.3%) responded correctly when they were asked about these symptoms [27].

Furthermore, in a study on a group of diabetic patients in a tertiary care hospital of Gujrat, India found that 51% of study population thought exercise could help to manage diabetes. However, in this study 242 (80.6%) patients believed that blood glucose levels can be controlled with exercise [28]. Another study conducted in the UAE on 575 patients with diabetes (who attended outpatient clinics), stated that 60% of the people believed that diabetes was caused by eating excessive sugar and sweets [23]. The statement is contradicting with findings of our study where only 29.0% of participants believed that diabetes could be controlled by reducing the sugar intake. Study carried out in five districts of Punjab Pakistan reported that half of study population 51.6% believed if parents are diabetic, their children are likely to have the risk of DM [29], which was lower than a study conducted in Sri Lanka where 73% of respondents reported a family history of DM as a risk factor [30] while in our study only 27% (n=81) patients responded to this question correctly which indicates that the people of Nawabshah, Shaheed Benazirabad have poor

knowledge regarding the association of diabetes and family history.

Moreover, in our study 120 (40.0%) patients maintained dietary schedule, and it is a common finding in several studies in which patients do not adhere to given schedule of diet as advised. Shooka et al. in a study conducted in Iran gave a figure of 27.0% which is much lower than current study while in another cross-sectional study conducted in Punjab, Pakistan found that around 47.0% patients follow a dietary plan. This indicates that the people of Pakistan are having better adherence to the therapy [6,31]. Control over metabolism is a key area in Type-II DM, so the best pathway to achieve that goal seems to be an emphasis on dietary adherence [32]. In our study 123 (41%) patients do not check their blood sugar levels regularly and 55 (18.3%) never monitor their blood pressure regularly. A meta-analysis of various studies presented that SMBG (self-monitoring blood glucose) was linked with better glycaemic control [33]. So, the patients should be counselled to check their blood sugar and blood pressure for better control of the diabetes.

According to our findings 32.7% (n=98) of patients were obese. Obesity was found to be associated positively with poor management of glycaemic control [34]. The risk of other comorbidities increases in Type II diabetic patients with obesity. A study mentioned that there were multiple factors like obesity, sedentary lifestyle and lack of regular exercise which increased the glycaemic level in diabetic patients [35,36].

Furthermore, this study shows that 35.0% (n=105) patients exercise habitually which is much higher than various studies. The study demonstrates that lifestyle education programs for people with diabetes should be arranged by endocrinologists with help of pharmacists, as it can bring significant benefits in improving glycaemic control [37,38].

Our research presents the results of a cross-sectional study. Some of the data of this research article may have resulted in memory bias specially in old age patients because the information was self-reported by the participants like the year of diagnosis. As the participants of the study are those who were more often concerned about their wellbeing so the selection bias may also be present. The likelihood of

linkage between the diabetes management and knowledge of the participants through the glycated hemoglobin (HbA1c) could not be done because of the limited finances and non-adherence of the patients. Effective management of diabetes might be accomplished involving clinical pharmacists and endocrinologists with the objective of improving patient knowledge of diabetes.

## 5. CONCLUSION

The overall level of knowledge of the patients regarding diabetes is poor and practice regarding diabetes falls under the category of average routine practice. Findings of the study conclude that awareness campaigns should be organized, and patient counselling should also be carried out on priority basis to improve the knowledge and practice among diabetic patients of Nawabshah, Shaheed Benazirabad. Continuous follow-up is the major concern to improve patient care. Educating people about diabetes might allow achieving better glycaemic control.

## CONSENT

As per international standard, patients' written consent was collected and preserved by the authors.

## ETHICAL APPROVAL

Ethical approval was taken from the Ethical Committee of Peoples Medical College Hospital, Nawabshah, Shaheed Benazirabad through letter NO. PMCHN (SBA)/-28748/51 dated 18th August 2019.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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