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ASSESSMENT OF DIABETES KNOWLEDGE AMONG PATIENTS ATTENDING A DIABETIC CLINIC AT A TERTIARY CARE PUBLIC HOSPITAL IN BAHAWALPUR

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Abstract

Background: *The prevalence of diabetes mellitus, a chronic metabolic disease, is rising worldwide. Sufficient patient awareness is necessary for both effective care and the avoidance of problems. Improving health outcomes requires evaluating diabetic patients' understanding of diabetes.*

Aims and Objectives: *The purpose of this study is to assess patients' knowledge about diabetes at a diabetic clinic at a public tertiary care hospital in Bahawalpur. Finding knowledge gaps in diabetes, its management, risk factors, complications, and preventive strategies is the goal.*

Methodology: *A descriptive-analytical, quantitative study was conducted from November 2023 to March 2024. A total of 271 diabetic patients meeting the inclusion criteria were selected through convenient sampling technique. A standardized, self-administered questionnaire encompassing demographic information, clinical history, and diabetes-related knowledge was used to gather data. Data analysis was done using descriptive statistics.*

Results: *Of the participants, 91% were between the ages of 30 and 50, and 72.6% were men. The most common kind of diabetes was type 2 (94%). Just 52% of respondents properly defined diabetes as having high blood sugar, and 51% were unaware that diabetic health education was available. Just 26.2% of respondents understood that diabetes is inherited, indicating a lack of knowledge of risk factors and complications. Just 21.4% of respondents reported making dietary changes, compared to 48.7% who reported routine blood sugar monitoring.*

Conclusion: *According to the report, patients' understanding of diabetes is seriously lacking. To improve self-care behaviors and avoid complications, better*

patient education programs that emphasize diabetes management, risk factors, and lifestyle changes are crucial.

INTRODUCTION

Diabetes is a long-term metabolic disease marked by high blood glucose levels. If untreated, diabetes can cause serious problems for the heart, blood vessels, kidneys, nerves, and eyes. The disorder is brought on by either insufficient insulin synthesis, inefficient insulin use, or a mix of both (Fradkin et al., 2016). Diabetes cannot be cured, but people can live healthier lives if it is effectively managed with medicine, lifestyle changes, and routine monitoring.

The A1C test, which calculates the average blood glucose levels over the previous two to three months, is one of several clinical tests used to diagnose diabetes. A1C levels below 5.7% are considered normal, those between 5.7% and 6.4% are considered prediabetes, and those at 6.5% or above are considered to be diabetes. Furthermore, according to Garcia et al. (2020), fasting blood glucose readings of less than 99 mg/dL are regarded as normal, those between 100 and 125 mg/dL as prediabetes, and those of 126 mg/dL or above as diabetes (Garcia et al., 2020).

One of the most urgent public health issues facing the world today is type 2 diabetes mellitus (T2DM), whose incidence is rapidly increasing, especially in low- and middle-income nations. Chronic hyperglycemia, or type 2 diabetes, is brought on by the body's inability to produce enough insulin or its resistance to it. The prevalence of T2DM has sharply increased during the last three decades at all socioeconomic levels. (Eriksen et al., 2021).

The International Diabetes Federation (2020) estimates that 463 million adults (ages 20 to 79) have diabetes in 2019, and by 2045, that figure is expected to increase to 700 million. 79% of people with diabetes live in low- and middle-income nations, where the disease is disproportionately more prevalent. Furthermore, one in five people over 65 have diabetes, and 232 million of those people do not have a diagnosis. Diabetes caused 4.2 million deaths and at least USD 760 billion in medical expenses worldwide in 2019 (Curran et al., 2020).

T2DM prevalence is startlingly high in Pakistan. According to recent statistics, 16.98% of people have diabetes, and 10.91% have indications of prediabetes. This represents a substantial rise above the results of the sole prior nationwide study, which was carried out in 1999(Lee). Evaluating diabetic patients' level of diabetes-related knowledge is essential for efficient disease management and prevention in light of this expanding public health concern.

Through its dedicated diabetic clinic, Bahawal Victoria Hospital in Bahawalpur provides care for about 3,000 people with diabetes. An average of 480 patients attend on Mondays, 246 on Tuesdays, 270 on Wednesdays, 265 on Thursdays, 290 on Fridays, 359 on Saturdays, and comparable numbers the following week. The weekly patient count fluctuates. The majority of patients come to the clinic for follow-ups every twelve days, routine checkups, and insulin administration. Comprehending their level of diabetes knowledge is essential for developing successful teaching methods that could result in better health outcomes and disease management.

Patients' self-management abilities can be greatly improved by educating them about diabetes and its complications. Patients can learn about diabetes risk factors, medication options, dietary needs, and self-care practices, such as taking good care of their feet, with the aid of a well-designed diabetes education program. According to studies, diabetes education helps patients follow their treatment plans and lifestyle modifications, which eventually improves their health (Nazar et al., 2015).

Research Purpose

Study's main goal is to determine how well-informed diabetic patients who visit a diabetic clinic at a public tertiary hospital in Bahawalpur, Pakistan, are about the disease. The goal of the study is to pinpoint knowledge gaps that could impede efficient illness treatment and offer suggestions for enhancing patient care and education.

Significance:

Developing focused educational programs requires an understanding of patients' diabetes awareness levels. Patients who get quality diabetes education are more equipped to follow their treatment regimens, avoid complications, and make educated decisions about their health. By highlighting gaps in patient

knowledge and suggesting methods for improved disease management, this study will support public health initiatives.

THEORETICAL REVIEW

Concept of Diabetes

The chronic metabolic disease known as diabetes mellitus (DM) is typified by hyperglycemia brought on by either insulin resistance (Type 2 DM) or insulin insufficiency (Type 1 DM). The illness is known as "mellitus" because of the presence of sugar in the urine. Insulin-dependent and non-insulin-dependent diabetes mellitus are the two main categories. Heredity, viral infections, autoimmune reactions, and obesity are among the causes. Polyuria, polydipsia, polyphagia, nocturia, weight loss, asthenia, and acetone breath are typical symptoms. (2024).

Table: Types of Diabetes

Sr. No	Types	Description
01	Type1 Diabetes	Due to autoimmune β-cell destruction, usually leading to absolute insulin deficiency
02	Type2 Diabetes	Due to a progressive loss of adequate β-cell insulin secretion frequently on the background of insulin resistance
03	Type 3Diabetes. Gestational diabetes Mellitus	Diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation
04	Specific types of Diabetes	Due to other causes, e.g., monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young), diseases of the exocrine pancreas (such as cystic fibrosis and pancreatitis), and drug- or chemical-induced diabetes (such as with glucocorticoid use, in the treatment of HIV/AIDS, or after organ transplantation)(Diabetes care, 2020).

Global Prevalence and Impact of Diabetes

The prevalence of diabetes mellitus has increased significantly over the past forty years, making it a major global health concern. With a prevalence of about 20% in Iraq, diabetes is a major cause of death (Mikhael et al., 2018). Similarly, the World Health Organization (WHO) reports that Nigeria has the greatest number of diabetes cases in Africa (Wild et al., 2004).

Even though the International Diabetes Federation (IDF) projects that the number of diabetes cases in Sub-Saharan Africa (SSA) would increase from 382 million in 2013 to 592 million by 2035, less than 1% of health spending is devoted to the disease (Shiferaw et al., 2020b). In 2013, 4.36% of Ethiopia's population was affected by diabetes, making it one of the developing nations with the highest rate of adult diabetes. (Shiferaw et al., 2020b).

Diabetes knowledge, treatment, and control are still low in China, where major risk factors for the disease include advanced age, obesity, and high triglyceride levels. (Qin et al., 2016). With an incidence of type-1 diabetes ranging from 0.1 to 17.4 cases per 100,000 persons, Latin America (LatAm) also faces difficulties. Nonetheless, the region lacks thorough surveillance for type-2 diabetes (Yovera-Aldana et al., 2021).

Complications and Management of Diabetes

Diabetes raises the chance of serious side effects, such as kidney failure, blindness, diabetic retinopathy, diabetic nephropathy, cardiovascular illnesses, and a lower quality of life. (Wang et al., 2018). People with diabetes also have a higher risk of fractures, especially those with Type 1 DM, where the risk ratio for hip fractures is 6.9 as opposed to 1.38 for Type 2 DM (Sanz-Nogués et al., 2020).

Adequate glycaemic control is necessary for effective diabetes management since it can considerably slow the evolution of the disease and lessen complications (Wang et al., 2018). But in many places, especially in low-to-middle-income nations where more than 80% of people with Type 2 Diabetes Mellitus (T2DM) live, awareness and treatment rates are still low. (Ong et al., 2018).

Health systems are essential for managing diabetes, but systematic reviews show that little is known

about how they affect T2DM knowledge, treatment, adherence, and control. (Ong et al., 2018). To enhance screening and management, particularly in environments with limited resources, predictive models and clinical recommendations are required. (Olivera et al., 2017).

Diabetes Knowledge and Self-Care Practices

Research highlights the value of diabetes education in encouraging self-care behaviors. Patients who are more knowledgeable about their illness are more likely to take good care of themselves, which lowers the chance of complications. (Kugbey et al., 2017). However, there is still a lack of knowledge about diabetes and associated risk factors in many developing nations, especially in rural regions. (Agbana et al., 2021).

Conclusion

Due to its substantial socioeconomic effects and rising incidence, diabetes mellitus is becoming a major global health concern. Better awareness, treatment, and control are necessary for effective management, especially in environments with limited resources. Diabetes care must be given top priority by health systems in order to reduce complications and improve the lives of those who are impacted.

RESEARCH METHODOLOGY

The knowledge of Type 1 or Type 2 diabetic patients, ages 16 to 80, about different facets of diabetes mellitus was evaluated using a descriptive-analytic quantitative research design. The study was carried out on patients who visited the diabetic clinic at Bahawal Victoria Hospital in Bahawalpur. A convenient sampling technique was used to choose the participants, and the inclusion criteria included being between the ages of 16 and 80, receiving clinical care, and having had a diabetes diagnosis for at least a year. Pregnant women, people with physical or mental disabilities, those who denied consent, and patients with diabetes for less than a year were not included.

A self-administered questionnaire with 27 closed-ended questions was used to gather data. The questionnaire was split into two sections: knowledge of diabetes mellitus (control, risk factors, complications, and precautions) and demographic and clinical data (age, gender, marital status, education, employment, weight, BMI, type of diabetes, family history, HbA1C level, and treatment). Respondents were told about the goals, risks, and advantages of the study before to participation, and their informed consent was acquired. Descriptive statistics and the T-test were used to analyze the data and assess the correlations between the variables. With formal consent from the dean, ethical approval was obtained from Quaid-e-Azam Medical College's institutional review board in Bahawalpur. Informed consent, anonymity, and confidentiality were among the ethical factors that ensured participant identities were kept private and that data were reported in aggregate form.

RESULTS

Participant Characteristics:

From November 2023 to March 2024, a total of 271 participant with complete data were assessed who met the criteria.

Characteristic of participants:

VARIABLE CATEGORIES	NUMBER	PERCENTAGE
GENDER		
MALE	197	72.6%
FEMALE	74	27.4%
AGE		
< 30 YEAR	5	2%
30 TO 50 YEAR	247	91%
>50 YEAR	19	7%
MARITAL STATUS		
SINGLE	21	7.6%
MARRIED	244	91.0%

WIDOW	6	2.3%
EDUCATION		
NO SCHOOL	128	47.2%
PRIMARY	70	25.8%
INTERMEDIATE	19	7.0%
METRIC	38	14.0%
HIGHER	16	6.0%
JOB		
PRIVATE	42	15.4%
GOVERNMENT	6	2.2%
HOUSE WIFE	36	13.2%
RETIRED	2	0.7%
UN-EMPLOYED	185	68.3%

Clinical Data of Participants:

Variable	Number	Percentage
Hypertension		
Yes	**191**	**70%**
No	**80**	**30%**
Smoking		
Yes	**73**	**27%**
No	**198**	**73%**
Alcohol		
Yes	**34**	**13%**
No	**237**	**87%**
Types of DM		
Type 1 DM	**12**	**4.4%**
Type 2 DM	**255**	**94.0%**
Gestational DM	**4**	**1.6**
When Diagnosed		
< 6 Month	**22**	**8.1%**
6 Month to 1 Year	**141**	**52.0%**
1 Year to 2 Year	**108**	**39.9%**
Family History		
Yes	**212**	**78.2%**
No	**59**	**21.8%**
HBA1C Level		
4 to 6	**123**	**45.3%**
7 to 8	**90**	**33.2%**
≥9	**58**	**21.4**
Treatment		
Oral	**114**	**42.1%**
Insulin	**139**	**51.3%**
Both	**9**	**3.3%**
None	**9**	**3.3%**

Knowledge of DM:

No	Question	Responses	Frequency	Percentage
01.	Do you know what DM is?	Yes No Not Sure	141 38 92	52% 14% 34%
02.	Do you know that elevated sugar in the body is DM?	Yes No Not Sure	141 38 92	52% 14% 34%
03.	Do you have any health education about DM?	Yes No Not Sure	21 111 139	8% 41% 51%
04.	Do you know types of DM?	Yes No Not Sure	63 104 104	23.2% 38.4% 38.4%
05.	Do you know sign & symptoms of DM?	Yes No Not Sure	98 104 69	36.1% 38.4% 25.5%

Control of DM:

NO	QUESTION	RESPONSES	FREQUENCY	PERCENTAGE
01.	Do you feel that you have sufficient knowledge about the management of your diabetic condition?	Yes No Not Sure	39 71 161	14.4% 26.2% 59.4%
02.	Do you follow a dietary modification to control your diabetes?	Yes No Not Sure	58 88 125	21.4% 32.5% 46.1%
03.	Do you perform regular sugar monitoring?	Yes No Not Sure	132 104 35	48.7% 13% 38.3%
04.	Do you perform regular exercise?	Yes No Not Sure	24 152 95	8.9% 56.1% 35%
05.	Do you have complete medical examination every 3 to 6 month?	Yes No Not Sure	21 205 45	7.7% 75.7% 16.6%

Knowledge of risk factors of DM

NO	QUESTION	RESPONSES	FREQUENCY	PERSENTAGE
1	Do you think that DM is heredity?	Yes No Not Sure	71 50 150	26.2% 18.4% 55.4%
2	Do you think that diet modification are important factors in reducing problems associated with DM?	Yes No Not Sure	79 103 89	29.2% 38.0% 32.8%

3	Do you think control of your blood glucose level is important factor in reducing DM?	Yes No Not Sure	43 88 140	15.9% 32.5% 51.6%
4	Do you think that life style modification are important factors in reducing problems associated with DM?	Yes No Not Sure	24 90 157	8.9% 33.2% 57.9%
5	Do you think that stress is a risk factor for DM?	Yes No Not Sure	51 86 134	18.8% 31.7% 49.5%

Knowledge of complication of DM

NO	QUESTION	RESPONSES	FREQUENCY	PERSENTAGE
1	Do you know that DM can lead to hyperglycemia and hypoglycemia?	Moderately agree Moderately disagree Strongly agree Strongly disagree undecided	42 45 50 38 96	15.5% 16.6% 18.5% 14.0% 35.4%
2	Are you aware that DM can lead to in which nerve damage and loss of sensation occurring?	Moderately agree Moderately disagree Strongly agree Strongly disagree undecided	12 72 15 11 161	4.4% 26.6% 5.5% 4.1% 59.4%
3	Are you aware that DM can lead to visual problems and blindness?	Moderately agree Moderately disagree Strongly agree Strongly disagree undecided	12 72 15 11 161	4.4% 26.6% 5.5% 4.1% 59.4%
5	Do you know that DM can cause foot ulcer that lead to amputation?	Moderately agree Moderately disagree Strongly agree Strongly disagree undecided	12 72 15 11 161	4.4% 26.6% 5.5% 4.1% 59.4%
6	Do you know that DM can cause renal problems that lead to renal failure?	Moderately agree Moderately disagree Strongly agree Strongly disagree undecided	12 72 15 11 161	4.4% 26.6% 5.5% 4.1% 59.4%

Knowledge of precaution of DM

NO	QUESTION	RESPONCES	FREQUENCY	PERCENTAGE
1	Do you follow dietarymodification to control your Dm?	Yes No Not Sure	58 88 125	21.4% 32.5% 46.1%
2	Do you perform regular exercise\walk?	Yes No Not Sure	24 152 95	8.9% 56.1% 35.0%
3	Do you check regular blood sugar?	Yes	132	48.7%

		No	104	38.45%
		Not Sure	35	12.9%
4	Do you maintain an ideal body weight?	Yes	20	7.4%
		No	128	47.2%
		Not Sure	123	45.4%
5	Do you take prescribed medication\insulin regularly?	Yes	200	73.8%
		No	30	11.1%
		Not Sure	41	15.1%
6	Do you have completed medical examination every 3 to 6 months?	Yes	21	7.7%
		No	205	75.6%
		Not Sure	45	16.6%

DISCUSSION

The purpose of this study was to evaluate the patients' awareness, knowledge, and habits regarding diabetes mellitus (DM) in the diabetic clinic at Bahawal Victoria Hospital in Bahawalpur. The results provide important light on the clinical, behavioural, and demographic traits of diabetic patients as well as their knowledge of risk factors, complications, and preventative measures. The findings are examined in light of previous research to draw attention to parallels, differences, and consequences for diabetes treatment.

Participant Characteristics

Of the 271 participants in the study, the majority were married (91.0%) and male (72.6%). The majority of participants (91.0%) were between the ages of 30 and 50, which is representative of the working-age population that is frequently impacted by diabetes. Unemployment was high (68.3%), and a sizable percentage (47.2%) lacked formal education. These results are consistent with research from low- and middle-income nations, where inadequate diabetes care is linked to unemployment and low educational attainment (Ogurtsova et al., 2017).

Clinical Data

Seventy percent of individuals reported having hypertension, which is in line with worldwide data showing a high prevalence of hypertension in diabetes patients (Smokovski and Smokovski, 2021). There were also reports of alcohol use (13%) and smoking (27%), two major risk factors for complications from diabetes. 94.0 percent of people had type 2 diabetes, which is consistent with global trends where Type 2 DM is responsible for the majority of diabetes diagnoses. (Garrib et al., 2023). 78.2% of participants reported having a family history of diabetes, highlighting the genetic component of the disease. However, 42.1% of individuals used oral drugs, while only 51.3% were on insulin therapy. This draws attention to deficiencies in insulin access and treatment compliance, especially in environments with minimal resources. (Shiferaw et al., 2020a).

Knowledge of Diabetes Mellitus

The study identified important knowledge gaps about DM. Only 23.2% of participants were aware of the many forms of diabetes, despite 52% knowing what DM is. In a similar vein, 8% of respondents said they had received health education regarding DM, and 36.1% acknowledged the disease's symptoms. These results are in line with research from underdeveloped nations, where inadequate knowledge and education prevent diabetes from being effectively managed. (Shiferaw et al., 2020a).

Control of Diabetes Mellitus

Just 14.4% of participants said they knew enough about how to manage their diabetes. Just 8.9% of respondents claimed frequent exercise, while 21.4% reported dietary changes. These findings are alarming because controlling diabetes requires lifestyle changes. (Qin et al., 2016). 48.7% of respondents reported regularly checking their blood sugar, which suggests that self-care habits need to be addressed.

Knowledge of Risk Factors

Just 29.2% of participants acknowledged the significance of dietary changes in lowering diabetes-related complications, and the majority (55.4%) were unclear whether diabetes is inherited. 18.8% of

participants cited stress as a risk factor, indicating a lack of knowledge on the psychological elements of managing diabetes. These results are consistent with research highlighting the necessity of thorough diabetes education initiatives (Kugbey et al., 2017).

Knowledge of Complications

With 59.4% of participants not knowing the connection between diabetes mellitus and nerve damage, vision issues, foot ulcers, and renal failure, participants' knowledge of diabetes consequences was lacking. This ignorance is concerning because serious consequences including blindness, amputations, and renal failure can be avoided by identifying problems early (Wang et al., 2018).

Knowledge of Precautions

Only 7.7% of individuals received full medical evaluations every three to six months, despite 73.8% reporting regular use of prescribed medications. This suggests a lack of routine monitoring and preventive care, both of which are critical for managing diabetes effectively (Ong et al., 2018).

Comparison with Other Studies

The study's conclusions align with both regional and worldwide data. For example, similar discrepancies in diabetes knowledge and self-care habits were found in an Ethiopian study (Shiferaw et al., 2020a). Poor diabetes management adherence and low awareness were also noted in China. (Qin et al., 2016). Nonetheless, this study's high frequency of hypertension and low health education levels underscore the particular difficulties faced by diabetes patients in environments with minimal resources.

Implications for Practice

The study emphasises the necessity of focused interventions to enhance diabetes education, self-care behaviours, and awareness. Programs for patient education should be given top priority by health systems, especially in underserved and rural areas. Preventive care and routine monitoring should also be prioritised in order to lessen the burden of complications associated with diabetes.

Limitations

Among the study's many drawbacks is its dependence on self-reported data, which could be biassed. The results' generalisability was limited because the sample was taken from a single clinic. To confirm these findings, larger and more varied groups should be included in future research.

Conclusion

This study identifies important gaps in Bahawalpur diabetic patients' self-care behaviours, understanding of complications, and diabetes knowledge. Improving diabetes outcomes and lowering the disease's worldwide impact require addressing these gaps through focused interventions and strengthened health systems.

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