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Assessing Knowledge, Attitude, and Practices Related to Diabetes Among Individuals Aged 20 to 60 in Different Geographical Regions of Pakistan

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ABSTRACT

Objective: To assess knowledge, attitudes, and practices related to diabetes among adults in different geographical regions of Pakistan.

Methodology: This cross-sectional study included 1,326 non-diabetic participants selected through stratified random sampling across Pakistan's four provinces, covering both urban and rural populations. A standardized questionnaire assessed demographic variables, diabetes-related knowledge, attitudes, and practices. Data were analysed using descriptive statistics, chi-square tests, odds ratios, and logistic regression.

Results: While 79.48% believed diabetes is treatable and 84.99% considered it preventable, 38.53% mistakenly thought it is contagious. Positive health behaviours were evident, with 98.94% reporting regular doctor visits and 89.81% maintaining a balanced diet and exercise regimen. Medication compliance was high: 98.71% reported tablet use, and 77.37% used insulin. Only 44.34% underwent regular blood testing. Participants with a family history of diabetes had significantly higher knowledge scores ($p < .001$), highlighting the influence of personal exposure.

Conclusion: Significant misconceptions about diabetes persist among the general population, despite generally positive attitudes and practices. Tailored public health strategies that consider individual risk factors, especially family history, are needed to improve diabetes awareness and management in Pakistan.

Keywords: Diabetes, knowledge, attitudes, practices, Pakistan, health literacy, public health, prevention.

Authors' Contribution:
[1,2,7]Conception; Conception of the work idea, data collection, [4-6]analysis and interpretation, drafting the manuscript, [3]reviewing and final approval.

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Introduction

Diabetes mellitus (DM) is a chronic illness in which the body either uses insulin improperly or does not produce sufficiently.[1] Hyperglycemia (high blood sugar) caused by uncontrolled diabetes has been associated with the degeneration of several organs and physiological processes, including blood vessels and neurons.[2] It is predicted that diabetic patients will increase twice within the period 2000-2030, especially in Asia has a higher increase rate.[3] South Asia is becoming a new frontier of this developing outbreak in the Asia region due to rapid change in its population, unhealthy nutrient intake, and lifestyle changes.[4] South Asians also have a higher risk of developing DM than other ethnic groups at a lower BMI and at a younger age.[5] Therefore, DM incidence among the population of DM patients in South Asia has risen sharply. This has exerted severe pressure on these countries' healthcare systems, many of which are ill-equipped to respond to these calls.[6]

According to the International Diabetes Federation (IDF), there were 537 million diabetics globally in 2021; by 2045, this number is expected to rise to 783 million.[7] Diabetes is more common in highly developed nations,

although its incidence is increasing at the fastest rate in developing nations.[2,8] The primary cause of the ongoing upward trend is the rise in type 2 diabetes patients, which is attributable to aging and population growth (39.7%), rising incidence (28.5%), and their combined effects (31.8%). Seventy percent (70%) of DM patients live in lower-middle-income nations.[5,6,9] Pakistan is categorized as a lower-middle-income nation by the World Bank. With 13.8 million persons affected, the prevalence of type 2 diabetes in Pakistan is steadily rising to an alarming 13.7%.[1] In addition, Pakistan is rated fourth in the world for the prevalence of diabetes.[7] In Pakistan, the prevalence of T2D is predicted to increase to 15% by 2040.[10] Estimates show that the prevalence of obesity in Pakistan is a startling 27.85% of the population. In comparison to data from other nations, Pakistan has a greater prevalence of type 2 diabetes.[11] Up until co-morbidities (such as eye disease or renal illness) manifested, a sizable fraction of Pakistan's population went untreated; 7.9 million people were estimated to have impaired glucose tolerance.[7]

Both medication and lifestyle modifications are necessary for the prevention of diabetes as well as its control.[12] Diabetes patients should take an active role in managing their condition since good adherence can greatly improve quality of life and either prevent or postpone long-term problems.[13] Patients' ability to self-manage their diabetes is significantly influenced by their level of diabetes education.[14] It is believed that those with a strong awareness of the disease are less likely to have numerous complications and severe exacerbations of diabetes because they have a better comprehension of the nature and effects of the condition.[15] Internationally accepted guidelines for treating diabetes place a strong emphasis on the need to provide diabetes information, support, and training for self-management to every patient.[16] People's decisions and actions, including their capacity to select and obtain the best type of healthcare, are influenced by their level of health literacy.[17]

Appropriate care and early diagnosis can reduce problems related to diabetes mellitus. By reaching adequate glycaemic control, the main goal of DM management is to postpone macro and microvascular consequences.[5] It entails changing one's lifestyle to include medication therapy, a balanced diet, and frequent exercise in addition to weight loss.[9] Health literacy is therefore essential to the management of diabetes. Patients who are well-informed about diabetes and its aftereffects look for appropriate care and treatment, taking responsibility for their own health.[18] There is compelling evidence that people with diabetes who practice attentive self-care and education attain more effective and long-lasting diabetes management.[15,16] There is also a little evidence on the general public's existing awareness, attitude, and behaviours about diabetes in Pakistan, although improved knowledge, a positive attitude, and better practices could all contribute to better management. Better insight would be gained for the creation of preventative measures tailored to the Pakistani setting if the general public's knowledge, attitudes, and practices around diabetes mellitus were identified. Thus, the purpose of this study was to assess a Pakistani cohort of the general public's knowledge, attitude, and practice about diabetes.

Methodology

This cross-sectional study was conducted across Pakistan’s four provinces: Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan. Each province was further stratified into urban and rural areas, resulting in eight distinct strata for sampling. Ethical approval was obtained from the institutional review board. Confidentiality and anonymity were ensured, and all data were stored securely following ethical standards.

A total of 1,326 participants aged 20–60 years were recruited using stratified random sampling. Within each geographical and urban/rural stratum, participants were proportionally allocated based on national population distribution data. Random sampling techniques (e.g., computer-generated lists, random number tables) were used to select individuals from each stratum.

All patients aged 20–60 years, residents of the selected region with no history of diabetes, and who provided informed consent were included in the study. Patients who were diagnosed with diabetes, pregnant or lactating women, and individuals with cognitive or communication impairments were excluded.

Data were collected using a structured, standardized questionnaire developed in English and translated into Urdu and other local languages. The tool covered:

- Demographics (age, gender, education, occupation)
- Knowledge (symptoms, risk factors, complications)
- Attitudes (perceived preventability, treatment beliefs)
- Practices (diet, physical activity, healthcare-seeking behaviour)

Trained researchers, including medical professionals, conducted face-to-face interviews. Verbal informed consent was obtained and documented before participation.

Data were entered into SPSS (Statistical Package for the Social Sciences) for analysis. Descriptive statistics summarized demographic characteristics and KAP responses. Chi-square tests were used for categorical comparisons, and logistic regression identified associations between knowledge levels and demographic/risk factors. Significance was set at $p < 0.05$.

Results

Data from a total of 1326 participants were studied, with 54.76% being females and 45.24% being males. Demographic variables are shown in Table I.

Pre-Screening Outcomes: The pre-screening outcomes reveal a mixed picture of health-related variables among the participants. A notable portion, 23.01%, were diagnosed with a health condition, indicating a significant prevalence within the sample. Additionally, over half of the participants (54.29%) reported a family history of diagnosis, suggesting a potential genetic predisposition or shared environmental factors. Chronic diseases were present in 30.69% of the individuals, highlighting a substantial burden of long-term health issues. However, the engagement in diabetes awareness programs was notably low at 6.11%, indicating a potential gap in preventive health initiatives. On a positive note, the majority of participants (76.09%) had access to a medical facility, which is crucial for timely interventions and healthcare management (Table II).

Out of 1,326 participants, knowledge levels varied significantly by region, education, and family history of diabetes. Key findings include:

Table I: Demographic Variables of included Participants.

Variables	Frequency (N)	Percentage
Gender		
Male	600	45.24
Females	726	54.76
Age Group (Years)		
21-40	980	73.90
41-60	316	23.83
61-80	30	2.27
Education		
Uneducated	225	16.96
Middle	501	37.78
Inter	262	19.75
Graduate	231	17.42
Masters	93	7.01
PhD	14	1.08
Occupation		
Jobless	339	25.56
Housewife	4	0.30
Private Job	821	61.91
Business	19	1.43
Labor	75	5.65
Farmer	3	0.26
Dispenser	5	0.37
Govt servant	41	3.09
Student	19	1.43
Marital Status		
Married	797	60.11
Unmarried	529	39.89
Number of Kids		
None	591	44.57
Less than 5	597	45.03
More than 5	138	10.40
Ethnicity		
Punjab	596	44.94
Sindh	368	27.75
Baluchistan	41	3.09
KPK	261	19.68
AJK	50	3.77
Gilgit	10	0.77
Residence		
Rural	544	41.02
Urban	782	58.98

General Knowledge: 84.99% recognized diabetes as preventable, while 79.48% believed it is treatable. However, 38.53% incorrectly thought it was contagious. (Table III)

Attitudes: 98.94% expressed willingness to visit doctors regularly, and 89.81% supported adopting a balanced diet and regular exercise. (Table IV)

Practices: 98.71% reported using oral medication when needed, and 77.37% used insulin (among those

who believed it was required). 44.34% engaged in regular blood glucose testing. (Table V)

Table II: Pre-screening of included Participants.

Variables	Frequency (N)	Percentage
Diagnosed		
Yes	305	23.01
No	1021	76.99
Family Diagnosed		
Yes	720	54.29
No	606	45.71
Chronic Diseases		
Yes	407	30.69
No	919	69.31
Diabetes Awareness Programs		
Yes	81	6.11
No	1245	93.89
Medical Facility		
Yes	1009	76.09
No	317	23.91

Table III: Knowledge Variables of included Participants.

Variables	Frequency (N)	Percentage
What is Diabetes?		
Yes	612	46.15
No	714	53.85
Is Diabetes Treatable?		
Yes	1054	79.48
No	262	20.52
Is Diabetes Preventable?		
Yes	1127	84.99
No	199	15.01
Is Diabetes Contagious?		
Yes	511	38.53
No	815	61.47
What are Causes of Diabetes?		
Yes	1123	84.69
No	203	15.31

Table IV: Attitudes of Patients Towards Diabetes Care

Variables	Frequency (N)	Percentage
Do Patients Regulate Blood level?		
Yes	657	49.54
No	669	50.46
Is Diabetes Fatal?		
Yes	904	68.17
No	422	31.83
Do patients do exercise and balanced diet?		
Yes	1191	89.81
No	135	10.19
Do Patients Maintain Blood Pressure and Exercise?		
Yes	940	70.88
No	386	29.12
Do Patients Visit Doctor Frequently?		
Yes	1312	98.94
No	14	1.06

Table V: Practices of Patients Towards Diabetes Care.

Variables	Frequency (N)	Percentage
Life Style Modifications Practices		
Yes	1000	75.41
No	326	24.59
Tablets Usage		
Yes	1309	98.71
No	17	1.29
Insulin Intake		
Yes	1026	77.37
No	300	22.63
Blood Testing Checkups		
Yes	588	44.34
No	738	55.66
Obesity in 40 Years Age		
Yes	1324	99.84
No	2	0.16
Risk Factors, Research, and Community Development		
Yes	912	68.78
No	414	31.22
Sugar Avoidance		
Yes	938	70.74
No	388	29.26

Influence of Family History: Participants with a family history of diabetes demonstrated significantly higher knowledge ($p = .000$).

Discussion

This study highlights a paradoxical pattern: while a majority of respondents hold positive attitudes and engage in health-supportive behaviours, substantial knowledge gaps and misconceptions—such as believing diabetes is contagious—persist. These misconceptions may stem from limited public health education and cultural beliefs.

Study establishes that individuals diagnosed with diabetes exhibit a markedly lower understanding of the condition, with 19 knowledgeable compared to 302 who are not, emphasizing the impact of personal diagnosis (P-value=0.000). The correlation between family history and increased awareness suggests that personal exposure plays a key role in shaping understanding. These findings align with prior studies emphasizing the impact of lived experience on chronic disease literacy.[19] The results also underscored the substantial role of personal and familial experience with diabetes, as well as consistent healthcare engagement, in fostering informed and proactive diabetes-related knowledge and attitudes. The consequences of diabetes are greatly impacted by low KAP, which raises the illness's morbidity and death rate.

Research on the link between non-diabetic and T2DM groups' knowledge and practice is scarce. Compared to those without diabetes, those with diabetes have been found to have higher KAP scores regarding the disease.[8,20,21] Our study evaluated the participants' knowledge of DM by asking them to describe its causes, risk factors, symptoms, consequences, and available treatments. The outcome is in parallel with another Palestinian research that reported that though the semi-urban participants revealed a poor awareness of the disease, the general community knowledge is acceptable.[21] That the level of awareness was low was associated with suboptimal diabetes care as well as other associated risk factors demonstrated by a KAP survey among the general population in rural Ethiopia.[8]

In this study, patients diagnosed with diabetes showed better knowledge than those who were not diagnosed in terms of understanding of diabetes. The knowledge of lifestyle modifications in this study is high (75.41%), as also reported in other studies.[2,3,18,21] In our study, patients with an immediate family member diagnosed with diabetes exhibited better knowledge than those without a family history of diabetes, with 276 individuals showing higher awareness (P-value=0.000). One of the characteristics that contributed to the majority of participants' poor diabetes-related KAP was their lower level of education. Gautam et al., showed that there was a substantial correlation between the participants' educational level and a higher KAP.[22] In this study, the findings also highlight that having an immediate family member diagnosed with diabetes enhances awareness of both preventability and treatability; 611 individuals recognize its preventability (versus 120 who do not, P-value=0.035) and 599 acknowledge its treatability (versus 132 who do not, P-value=0.015). Another study in Riyadh, between diabetic and nondiabetic participants, also demonstrated that educational level correlated positively with KAP scores among the two groups of participants.[23] To compare the level of knowledge among patients and those who have not been to medical facilities regarding what diabetes is, this study showed that the former had a higher percentage of correct knowledge. Specifically, doctors and 512 individuals who had visited any health facility within the past week demonstrated a higher level of knowledge than 515 individuals who had never visited a doctor, P-value = 0.000. These findings are contrary to those of a related study carried out in Nigeria, which revealed that 90% of the participants held an unfavourable attitude towards doctors.[2] These negative attitudes that exist in Nigeria can be a result of poor understanding of diabetes care and the cardinal management approach of drug regulation, plasma blood glucose.[2] Holding a positive attitude towards diabetic care is essential in diabetes care and may result in engagement in diabetic care programmes.[9]

In our study, there were higher levels of knowledge among those with chronic diseases as compared to those without chronic diseases in the aspect of what diabetes is. This was true in the data, with 92 participants diagnosed with chronic diseases having higher knowledge than 322 participants who were not diagnosed with any chronic diseases (P-value=0.000). They identified excessive eating (36.0%), impaired vision (39.00%), and excessive urine (58.0%) as signs of diabetes mellitus, in contrast with a study conducted by Weerasekara et al., among college students.[24] Despite generally proactive health behaviours, the relatively low percentage of individuals undergoing regular blood testing (44.34%) indicates a need for improved screening and monitoring practices in non-diabetic populations.

The regional and rural/urban disparities observed in the dataset underscore the importance of geographically tailored interventions. Efforts to improve public understanding should focus on correcting misconceptions while reinforcing positive behaviours.

Conclusion

The study underscores the need for enhanced public health education to address misconceptions and improve diabetes awareness in Pakistan. Interventions should focus on: Correcting misinformation (e.g., non-contagious nature of diabetes), promoting routine screening, especially in high-risk individuals, leveraging family history as a tool for targeted awareness, and public health strategies tailored to geographic, cultural, and socioeconomic contexts will be crucial to curbing the diabetes epidemic in Pakistan.

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