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Alexithymia, Diabetes Adherence and Self-care Behaviors among Type 2 Diabetes Patients

Zahra Batool[1] and Amna Khawar[2]

1. MS Health Psychology
Department of Applied Psychology
Lahore College for Women University, Lahore.

2. PhD Psychology
Assistant Professor, Department of Applied Psychology
Lahore College for Women University, Lahore.
Email: aamnakhawar786@yahoo.ca (corresponding author)

ABSTRACT

Diabetes is a non-curable, chronic, and prevalent disease that has become a major health concern worldwide. Pakistan ranks 3rd among diabetes-prevalent countries. People with diabetes are also known to commonly suffer from alexithymia, which is a personality construct with features that prevent the patient from identifying one's feelings and distinguishing them from bodily sensations. The main objective of this study was to examine the relationship among alexithymia, diabetes adherence, and self-care behaviors among type 2 diabetes patients. A sample of 300 type 2 diabetes patients were approached through a purposive sampling technique. The study found that alexithymia has a positive correlation with poor diabetes adherence. Moreover, alexithymia also predicted poor self-care behaviors in patients. This study has implications for healthcare professionals, psychologists, and diabetes management societies in Pakistan. Diabetes patients need support for awareness programs, health interventions, and screening strategies to prevent problems related to alexithymia.

Keywords: Alexithymia, Self-care behaviors, Diabetes adherence, Type 2 diabetes

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INTRODUCTION

Diabetes is a life-long, non-curable, and prevalent disease. It is also known as a "global killer." It is attributed as the 9th leading killer and 1st principal factor of amputation, blindness, kidney failure, and premature deaths (Khan et al., 2020). Worldwide, the prevalence of diabetes has increased dramatically (Akhtar et al., 2019). According to the International Diabetes Federation (2021), almost 537 million people in the age range of 20-79 years are suffering from diabetes around the globe and this figure will accelerate to 643 million in 2030 and 784 million in 2045. The healthcare burden has also increased overall due to high diabetes prevalence. Healthcare expenditures for diabetes management and prevention of complications were estimated to be USD 966 billion in 2021. It is forecasted that these expenditures will increase to USD 1,054 billion by 2045 worldwide (Ganasegram et al., 2020).

Type 2 diabetes patients have 20 years less life expectancy compared to non-diabetic patients (Azeem et al., 2022). Research suggests that there is a high incidence of type 2 diabetes in low- and middle-income countries. Asia is considered as the "diabetes epicenter" of the world. The International Diabetes Federation ranks Pakistan 3rd among diabetes prevalent countries in 2021. People with diabetes, prediabetes, and undiagnosed diabetes in the country are estimated at 33 million, 11 million, and 8.9 million respectively. Prevalence of diabetes is the same across gender however, it is higher in urban areas of Pakistan (Bhatti, 2021). Research done by Meo and colleagues (2016) reported that the prevalence of type 2 diabetes in Pakistan is 11.20% in males and 9.19% in females. Furthermore, the mean prevalence of type 2 diabetes in Sindh province is 16.2% in men and 11.70% in women, in the Punjab province it is 12.14% in males and 9.83% in females, in the Baluchistan province it is 13.3% in males and 8.9% in females, and in Khyber Pakhtunkhwa (KPK) it is 9.2% in males and 11.60% in females.

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The rising burden of diabetes disease is mainly attributed to emotional and environmental changes. Moreover, many genetic factors also play a contributing role. The main contributors are family history of diabetes, aging, non-white ethnicity, urbanization, obesity, caloric-rich diet, smoking, hypertension, sedentary life-style, insomnia, depression, and poor emotional regulation (Bellou et al., 2018). The chronic nature of diabetes can cause many biological, psychological, and social problems. Impaired glycemic levels hurt the patient's brain and mental functioning. This is why many mental disorders such as depression and anxiety are common in diabetic people compared to non-diabetics. Literature also demonstrates that nearly 30% of patients with type 2 diabetes exhibit depressive symptoms and 20% have apprehension. Poorly controlled diabetes is also known to be associated with alexithymia (Avci & Kellici, 2016).

Alexithymia can be described as a personality trait that is marked by the inability to distinguish between emotions, thoughts, and physiological responses and difficulty in recognizing and describing emotions (Sifneos, 1996). It is linked to many psychopathologies and psychosomatic disorders such as depression, autism, anxiety, sexual disorders, stress-related disorders, traumatic brain injuries, hypertension, cancer, and arthritis (Degirmencioglu et al., 2021). Earlier, alexithymia was considered a clinical disorder, only related to psychosomatic patients. However, now alexithymia is referred to as a personality trait that affects many physical and psychiatric disorders. Individuals with alexithymic characteristics cannot identify and regulate emotions and they are known to misinterpret sensations (Nadeem et al., 2022). Type 2 diabetics with alexithymic features experience high stress levels and poor metabolic control.

Martino and colleagues (2020) studied alexithymia in relation to type 2 diabetes and concluded that diabetics with comorbid alexithymia have high HbA1C levels, psychological distress, and poor self-care behaviors. Another research explored that difficulty in emotional

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regulation in patients is related to poor glycemic levels, and adherence and compliance to treatment regimen (Avci & Kelleci, 2016). Additionally, Stingl and colleagues (2018) found that type 2 diabetics have high levels of alexithymia and have more difficulty in describing and identifying emotions and lower levels of externally oriented thinking. Other research shows that alexithymic features are related to increased severity of disease, progression of disease-related complications, and decreased adherence and compliance to treatment (Shahi & Mohammadyfar, 2016; Shayeghian et al., 2016; Minf et al., 2014). Treatment adherence is key to preventing serious health complications and mortality due to disease and helps in achieving glycemic control which is the target of diabetes management (Aminde et al., 2019).

Active participation of patients is required for effective diabetes management (Hennessy & Peters, 2019). Adherence to a diabetes management plan such as medications, exercise, diet, and monitoring of blood sugar levels is necessary to control glycemic levels and prevent diabetes-related complications. Non-adherence to a diabetes management plan can lead to increased rate of morbidity and mortality among type 2 diabetics (Awodele & Osuolale, 2015). Poor management of diabetes also results in the development of mental health problems. Many psychological issues such as stress, anxiety, insomnia, eating disorders, distress, depression, and alexithymia are associated with poor diabetes management and increased complications among patients (Sharma et al., 2021).

Shayeghian and colleagues (2016) studied the relationship of alexithymia with glycemic levels and diabetes management in type 2 diabetes patients. Results explored that alexithymia has a negative association with diabetes management and glycemic control in patients. Mannan and colleagues (2021) conducted research to find out adherence on diabetes self-management. Research findings concluded that low adherence leads to poor diabetes management among

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patients. Mental health problems also lead to poor diabetes adherence and self-care behaviors. A study concluded that resilience leads to better diabetes adherence however, depression and diabetes distress lead to poor treatment adherence among patients (Rahimi et al., 2020). Naghipoor and Besharat (2021) researched to show that aggression, angry thoughts, and alexithymia lead to poor management of diabetes in type 2 diabetics. Their results revealed that patients with these psychological problems have less controlled diabetes and more diabetes-related complications.

Adherence to self-care behaviors is necessary to prevent diabetes-related complications and metabolic control and is also essential to reduce the mortality rate (Paudel et al., 2022). Some factors that are related to non-compliance in self-care behaviors include older age, female gender, health status, poor family support, health care cost, complexity of medical regimen, socio-economic status, and psychosocial problems (Khuzaimah et al., 2014). Self-care for diabetes can be defined as the development of knowledge and awareness that is necessary for living with the complex nature of diabetes. Several self-care behaviors including regular exercise, healthy nutrition, self-monitoring of blood sugar, compliance and adherence to medical treatment, healthy coping skills, and risk reduction behaviors are essential for optimal management of diabetes among patients. Diabetes self-management requires personal involvement to make dietary changes and lifestyle modifications for successful management of diabetes (Shrivastava et al., 2013).

A study determined the influence of self-care practices on blood glycemic level among type 2 diabetes patients (Shah et al., 2021). The results revealed that patients who had adherence to self-care practices also have optimal blood glucose levels and high quality of life. Another research was conducted to examine the correlation between diabetes knowledge, blood glucose

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level, and self-care practices in patients with diabetes mellitus in Pakistan (Bukhsh et al., 2019). The researchers found that diabetes-related knowledge was positively correlated with improved glycemic levels and self-care behaviors. Moreover, results concluded that having diabetes knowledge and self-care behaviors help in preventing short-term and long-term complications among patients. Additionally, another research explored the outcomes of self-care behaviors on glycemic levels, knowledge, and attitude in type 2 diabetes patients (Moghadam et al., 2017). Results found that self-care behaviors and their knowledge improved metabolic control, HbA1C levels, and positive attitude towards disease.

Many psychosocial problems also create hindrance in the way of practicing self-care behaviors. Research was conducted to investigate the impact of stressful conditions, and behavioral and psychological factors on self-care behaviors among diabetics (Lastretti et al., 2021). The results found that many physical factors (glycemic levels, lipid profile and hypertension), behavioral factors (smoking, drinking alcohol, BMI, and inactive lifestyle) and mental health conditions (stress, depression, alexithymia, and health anxiety) were linked to poor self-care behaviors.

Overall, alexithymia limits patients' ability to perform self-care behaviors. Research conducted to determine the effect of alexithymia in poor glycemic control and self-care behaviors found that alexithymia has a positive association with poor glycemic levels and negative association with self-care behaviors (Shayeghian et al., 2016). Furthermore, research was conducted to determine whether alexithymia or depression influence activities related to diabetes management in type 2 diabetics. Results concluded that diabetes mellitus patients who had alexithymic symptoms also have poor HbA1C levels, hypertension, and triglyceride levels

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than patients with depressive symptoms meanwhile, alexithymia was also linked with poor diabetes management (Luca et al., 2015).

The relationship of alexithymia, diabetes adherence and self-care behaviors can be better understood through Attention-Appraisal model of alexithymia. This model was developed by Preece and colleagues in 2017 and has two stages: “attention stage and appraisal stage”. According to this model, attention stage is related to externally oriented thinking. At this stage, alexithymic patients have difficulty in focusing attention on their emotional responses. Moreover, appraisal stage is related to difficulty in identifying and describing feelings. At this stage, alexithymic patients face difficulty in appraising their emotional responses (Preece et al., 2017). Type 2 diabetics who show signs of alexithymia often experience deficit in both stages that lead to poor diabetes management. Difficulty in emotional regulation can cause dysfunctional autonomic nervous system and neuroendocrine responses in type 2 diabetics (Taylor & Begby, 1997). Difficulty in paying attention to emotional responses is also associated with a lack of concern towards glycemic levels and results in poor adherence and self-care behaviors among type 2 diabetics (Naito et al., 2021).

Rationale of the study

Keeping in view the above-mentioned discourse, the goal of the current research is to determine the association among alexithymia, diabetes adherence, and self-care behaviors in type 2 diabetes patients. Considerable research shows the link between alexithymia, diabetes adherence, and self-care behaviors among diabetics. We know that alexithymia can lead to poor diabetes management among diabetes mellitus patients. In Pakistan, patients suffering from type 2 diabetes are increasing day by day due to unhealthy lifestyle. Health care providers emphasize self-care behaviors and provide counselling regarding adherence and complications towards

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medical regimen, even then, it has been seen that patients have poor diabetes management. Besides these medical factors, many underlaying psychological factors contribute to poor diabetes management. One of them is alexithymia, which has not been studied from the perspective of Pakistani type 2 diabetes patients. Therefore, there is an urgent need to study alexithymia and its impact on diabetes management among Pakistani type 2 diabetes patients. This current research will help physicians and health care providers to improve support for type 2 diabetes management. It will also help in incorporation of psychological and behavioral assessment and interventional strategies within the routine medical care for type 2 diabetes patients. The current research is also filling the gap in literature by presenting the link between alexithymia, diabetes adherence and self-care behaviors in diabetes patients.

METHODOLOGY

Research Design

To quantitatively examine the relationship between the study variables (alexithymia, diabetes adherence and self-care behaviors in patients having type 2 diabetes) a cross-sectional study design was used.

Ethics

The approval for conducting the research was taken from the departmental ethical board and board of studies. Permission for data collection was taken from the Medical Superintended of Sir Ganga Ram Hospital, Lahore. The authorities were assured that the participants will not be psychologically or physiologically harmed. The confidentiality of the data was maintained. Participants were provided with informed consent, and they were informed about the study goals. In case of any psychological help and need for behavioral management a professional heath

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psychologist was available. The participants were also told that they can leave the interview at any stage they want.

Sample

Non-probability purposive sampling technique was used to approach patients. The participants were selected from Sir Ganga Ram Hospital, Lahore. A sample of 300 type 2 diabetics (men n=150, women n=150) were taken. The sample age varied from 35 to 75 years (*M*= 50.49, *SD*= 8.93). Patients with minimum one year of diabetes onset and having recent HbA1C report (within 3 months) were eligible to participate. The patients with perceptual and other endocrinological disorders were excluded from the study.

Instrument Measures

Demographic Questionnaire

A self-made demographic information sheet was used to collect participants' information regarding their age, gender, last degree received, employment status, duration of diabetes, expense per month on treatment, and Body Mass Index (BMI).

Perth Alexithymia Questionnaire

The Perth Alexithymia Questionnaire was developed by Preece and colleagues in 2018. It contains 24 items and has five subscales named: "Negative Difficulty Identifying Feelings (NDI-F), Positive Difficulty Identifying Feelings (PDI-F), Negative Difficulty Describing Feelings (NDD-F), Positive Difficulty Describing Feelings (PDD-F) and General Externally Oriented Thinking(G-EOT)". This current study summarized alexithymia as "inability to describe and identifying feelings and difficulty in focusing attention to emotions. It includes positive as well as negative emotions". Each statement is based on a "7-point Likert scale" that ranges from

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"strongly disagree" to "strongly agree". Higher score on items represents a high level of alexithymia. The alpha value of PAQ is .91.

Diabetes Compliance Scale

The Diabetes Compliance Scale (Shamim & Sohail, 2011) is a self-report measure and consists of 7 items. It has two subscales named: "Non-Compliance to Medical Regimen and Compliance to Medical Regimen". In the current study, adherence is defined as "adherence to medical regimen prescribed by the physician. It refers to following the directions of a physician for taking medications, monitoring blood glucose levels, doing exercises, and avoiding an unhealthy diet." Items are rated on "5-point Likert scale" that ranges from "strongly agree= 5 and strongly disagree= 1". High score on items indicates better compliance to medical regimen.

Perceived Diabetes Management Scale

The Perceived Diabetes Management Scale (Wallston et al., 2007) comprises of 8 items. In this scale, self-care behaviors are defined as "the extent to which patients feel confident in their ability to manage their diabetes successfully. It involves healthy eating behaviors, taking medications regularly, self-monitoring of blood glucose levels and physical activity." Items are scored on a "5-point Likert scale" where "1= strongly disagree" and "5= strongly agree". A High score on items indicates confidence on self-management of diabetes. Items 1, 2, 6, and 7 have been reverse coded.

Data Collection

The Forward and backward translation procedure was used to translate research survey into Urdu. A pilot study with 30 respondents was conducted to remove any ambiguity in the scale translation and data collection. Each participant took 20-30 minutes to complete the questionnaires in the presence of the researcher and a professional health psychologist.

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Data Analysis

The collected data was entered in SPSS version 22. Scoring of measures was done through standard procedures. Correlational analysis was carried out to identify the relationship between variables. For predicting variables, multiple regression analysis was used. In the current study, alexithymia is the independent variable and diabetes adherence, and self-care behaviors are the dependent variables. The hypotheses for this study are: H1. There is a positive correlation between diabetes adherence and self-care behaviors in type 2 diabetes patients; and H2. Alexithymia is negatively correlated with diabetes adherence and self-care behaviors in type 2 diabetes patients.

RESULTS

Demographic Results

Table 1 illustrates that the mean age of participants is 50.5 years. Most of the participants are illiterate (42%) and majority and not working (49%). Participants mean duration of diabetes and BMI is 9.30 years and 29.15, respectively. Moreover, the average treatment expenses per month is PKR 1,647.

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Table 1:
Frequencies and Percentages of Demographic Variables of Participants (N = 300)

Variables	*F*	%
Age (Mean =50.49, SD= 8.93)		
Gender		
Male	150	50
Female	150	50
Last Degree Received		
Illiterate	126	42
Primary	29	10
Middle	37	12
Matric	55	18
Intermediate	27	09
Bachelor and above	26	09
Employment Status		
Working	77	26
Non-working	146	49
Self-employed	25	08
Govt. Employed	21	07
Retired	31	10
Duration of Diabetes (Mean= 9.30)		
Expense on Treatment per month (Mean =PKR 1,647)		
Body Mass Index (Mean= 29.15)		

Correlational Analysis Results

Results in table 2 illustrates that alexithymia has a negative correlation with diabetes adherence (r=-.17, p<.01) and self-care behaviors (r=-.24, p<.01). Moreover, diabetes adherence has positive association with self-care behaviors (r=.60, p<.01). The correlation analysis shows a significant negative association among alexithymia, diabetes adherence and self-care behaviors.

Table 2
Correlation between Alexithymia, Diabetes Adherence and Self-care Behaviors (N =300)

Variables	***M***	***SD***	**1**	**2**	**3**
Alexithymia	97.60	23.35	-	-.17**	-.24**
Diabetes Adherence	26.16	2.48	-	-	.60**
Self-care Behaviors	21.88	5.59	-	-	-

*Note: **p<.01, M= Mean, SD= Standard Deviation*

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Multiple Linear Regression Analysis Results

Results from Table 3 show that alexithymia is negatively predicting self-care behaviors (β=-.14, SE= .01, p<.01). Moreover, diabetes adherence is positively predicting self-care behaviors (β=.58, SE= .10, p<.001). The overall model explains 38% of the variance in self-care behaviors.

Table 3
Linear Regression on Alexithymia and Diabetes Adherence as Predictors of Self-care Behaviors (N= 300)

Variables	Self-care Behaviors		
	B	***SEB***	***β***
Alexithymia	-.03	.01	-.14
Diabetes Adherence	1.30	.10	.58
R^2	.38		
F	92.32		

Note: *B= Unstandardized beta, β= Standardized beta, SEB= Standard Error, ***p<.001. df= 2, 297*

DISCUSSION

Considerable research has shown that incidents of type 2 diabetes is increasing worldwide, as well as in Pakistan (Bhutta et al., 2022; Sun et al., 2022; Khan et al., 2020; Meo et al., 2016). High prevalence of type 2 diabetes can cause many physical and psychological consequences among patients (Sharma et al., 2021; Onyenekwe et al., 2020; Shayeghain et al., 2020; Jafee, 2019; Garrett et al., 2014). The purpose of the current study was to measure alexithymia and its impact on diabetes adherence and self-care behaviors in Pakistani patients living with type 2 diabetes. Correlational and regression analysis were used to explore the direction of relationship and predictive role of variables.

The findings of the Pearson correlation analysis revealed that high level of alexithymia is correlated with poor diabetes adherence. This study finding is consistent with existing literature. A research conducted by Azad et al. (2014) suggested that type 2 diabetes patients in Pakistan

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who had emotional irregularity show poor diabetes management and elevated blood glucose levels. Another research was done on middle-aged rural type 2 diabetes patients of Pakistan. The findings concluded that poor emotional management has negative impact on adherence to treatment (Ansari et al., 2022). Research done in other countries also report similar results, suggesting that alexithymia is linked with poor adherence and compliance to treatment plans among type 2 diabetes patients (Khout et al., 2019; Marchine et al., 2018; Melin et al., 2016; Shayeghain et al., 2015).

Moreover, the findings of the current study also revealed that alexithymia negatively correlates with self-care behaviors. These findings are similar to pervious research, which suggests that high levels of depression, anxiety and emotional irregularity are associated with poor self-care activities among Pakistani type 2 diabetes patients (Yusuf & Hanif, 2017). Research carried out in Western cultures also reported the same findings, arguing that poor self-care behaviors are the result of poor emotional regulation, depression, and anxiety (Oluma et al., 2020; Mogre et al., 2019; Avraham et al., 2016; Geisel-Marbaise & Stummer, 2010).

Moreover, in the present study, we found that high level of diabetes adherence is related to high level of self-care behaviors. Literature also confirmed this relationship. Recent studies confirm that poor diabetes adherence leads to poor self-care activities and elevated HbA1c levels among type 2 diabetes patients in Pakistan. Meanwhile, diabetes adherence and self-care behaviors are interrelated to each other (Khowaja et al., 2023; Bukhsh et al., 2020). Another study reported that a high level of adherence to treatment regimen results in optimal glycemic control and better self-care practices among type 2 diabetes patients (Kandel et al., 2022; Alhaiti et al., 2020; Afaya et al., 2020; Borji et al., 2017).

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Furthermore, our study confirms that alexithymia and poor diabetes adherence play a predictive role in poor self-care behaviors in type 2 diabetes patients of Pakistan. The outcomes of this study are comparable to those existing in the literature. A research conducted in Pakistan showed that poor diabetes management and poor control of diabetes are predictors of emotional and psychological problems and vice versa (Khan et al., 2019). Another research suggested that emotional problems and diabetes distress are significant predictors of ineffective management of diabetes among Pakistani type 2 diabetes patients (Sadiq & Batool, 2017). Research done in other countries also found the same results, and reported that emotional disturbances (i.e., symptoms of alexithymia, depression, anxiety, and stress) and non-adherence to treatment plans predict poor diabetes self-management, more diabetes related complications and high HbA1c levels (Bahadori et al., 2022; Khout et al., 2019; Lai et al., 2019; Luca et al., 2015).

Literature also showed that major causes of poor adherence and self-care behaviors among type 2 diabetes patients of Pakistan are poor emotional management, illiteracy, lack of awareness, long-term treatment plan, and low socio-economic status (Sharif et al., 2023; Ansari et al., 2022; Azeem et al., 2022; Bukhsh et al., 2020). Additionally, in other countries factors that lead to poor diabetes management among type 2 diabetes patients include, long illness duration, advancing age, lack of diabetes knowledge, family history of mental problems, needle phobia, high treatment cost and low income levels (Afaya et al., 2020; Avci & Kellici, 2016; Hintistan et al., 2013).

Limitations

The study was conducted in Lahore city, and thus generalizing the findings for all of Pakistan is not possible. The current study utilizes a cross-sectional research design, and it is recommended that to identify the constant effects of alexithymia on patients there should be well-designed

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longitudinal studies. Data for the current study was collected from only one government hospital, and it is also recommended that future research should survey different government and private sector hospitals so that the role of socioeconomic factors can also be assessed. Continued research in this area is needed and the relationship of alexithymia with other chronic illnesses should also be explored in Pakistan.

CONCLUDING RECOMMENDATIONS

This research confirms the relationship among alexithymia, diabetes adherence and self-care behaviors in diabetes patients of Pakistan, and that alexithymia has a negative relationship with diabetes adherence and self-care behaviors. The study findings imply that there is a dire need to educate patients and their families about alexithymia and how it affects the course of illness and diabetes management. The type 2 diabetes patients besides knowing their symptoms, treatment, management, self-care, and outcome should also be aware of all the psychological variables attached to their course of illness and the ones that can affect their management of diabetes, specifically alexithymia. For this purpose, seminars, educational campaigns, and awareness drives should be run and brochures should be distributed among patients having type 2 diabetes. Additionally, psychologists should design screening tools to assess alexithymia in patients having type 2 diabetes. There is also need for research for developing indigenous interventional strategies for improving alexithymia in patients who have the risk of developing disease-related complications and poor self-care management. Availability of health psychologists along with health care providers should be ensured in hospitals, so that patients can better manage their disease with the help of psychological counselling and therapies.

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There is also great need for policy making in the field of health psychology. Hospital and health care sectors in Pakistan do not hire health psychologists, however these health professionals are vital for the support of the psychological needs of chronic disease patients. The foreign health care system has acquired the model of hiring health psychologists into the team of health care provider long go but unfortunately Pakistan is still lagging in this area. Healthcare providers who are engaged in treating type 2 diabetes patients should also be trained in the management of psychological conditions which create hindrance in practicing self-care behaviors. Finally, it is recommended that the health care sector and Diabetes Community of Pakistan should incorporate mental health professionals and specialized providers to support alexithymia into the multidisciplinary team of diabetes care. This will improve patients' health outcomes and it will also help to reduce the health care burden and costs overall.

Conflict of interest statement
Authors declare that they have no conflict of interest.

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Ethics and Permission
The study was approved by the Institutional Research Board and Ethical Review Committee of the Department of Applied Psychology, Lahore College for Women University, Lahore. Written Informed consent was taken from participants by the researcher.

Author Contribution Statement
ZB conceptualized and conducted the study under the supervision of AK. Both authors drafted and approved the final version of manuscript.

Data sharing availability statement
Data can be obtained from the corresponding author upon reasonable request.

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