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Exploring Psycho-Diabetic Distress across Different Measures of Body Mass Index and Glycated Haemoglobin among Diabetic Patients

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ABSTRACT

In Pakistan, mental health aspects of chronic diseases like diabetes are often overlooked due to multiple factors such as limited awareness, social stigma, and insufficient integration of psychological services within healthcare settings. Consequently, many diabetic patients experience psycho-diabetic distress. Therefore, this study was carried out to explore the psycho-diabetic distress among diagnosed patients with pre-diabetes, diabetes type-1 and type-2 symptoms across different measures of body mass index (BMI) and Glycated Haemoglobin (Hba1c). For this purpose, a sample of (N=198) diabetic patients were selected by using purposive sampling method. Level of psycho-diabetic distress was measured by using two valid and reliable scales. The results from the collected data revealed that psycho-diabetic distress was higher among the pre-diabetic patients having Hba1c from 5.7%-6.4%. No significant differences were found in the level of psych-diabetic distress among the patients with type-1 diabetes who scored 5.7%-6.4% Hba1c in contrast with those who scored above 6.5% Hba1c. Similarly, psycho-diabetic distress was higher among type-2 diabetic patients who scored 5.7%-6.4% as compared with those who scored above 6.5% Hba1c. Moreover, the psycho-diabetic distress was higher among underweight or overweight diabetic patients. Hence, on the basis of the findings this concluded the diabetic patients are suffering with higher psycho-diabetic distress at pre-diabetes or type-1 diabetes. So, managing psycho-diabetic distress at initial level is crucial to rescue the mental health of diabetic patients.

Introduction

This is an acknowledged fact that diabetes mellitus (DM) is a chronic disease affecting the individuals above 65 years of age. Due to this age factor they cannot combat with this fatal disease and doomed in many mental health issues. Resultantly, they become physically weak due to poor diet and unhealthy life style (Zhou et al., 2024). According to the International Diabetes Federation (IDF), approximately 26.7% of Pakistani adults are living with diabetes; totaling around 33 million individuals (Isfandari et al., 2023). On the other hand Mental Health wellbeing plays an important role in the diabetes management process in an individual. Often the focus on mental health of the individuals living with diabetes is not targeted which in turn leads to complications related to the disease in it. Poor adherence to medication is linked to poor Glycated Haemoglobin (HbA1c), blood pressure and cholesterol control. It is evident that non depressed individuals living with diabetes are most likely to adhere to the medications as compared to those people living with diabetes and are also depressed (Abbas et al., 2023).

Patients with imbalance body mass index (BMI), severe psychological distress, low social support have poor self-care related to diabetes control (Owenes et al., 2018) So the persistent nature of diabetes not only leads to physical complications such as cardiovascular diseases, nephropathy, and neuropathy but also contributes to psychological issues, including depression, anxiety, and diabetes-related distress. These mental health challenges can adversely affect patients' self-care practices, medication adherence, and overall quality of life (Khan et al., 2010). It has also been observed that there is a significant relationship of body mass index (BMI) with diabetes among adults. Higher body mass index (BMI) is a risk factor for further developing type 2 diabetes among adults (Aslam et al., 2022). A balanced and healthy body mass index (BMI) is considered to be supportive in mitigating or reducing in Glycated Haemoglobin (Hba1c) among adults. According to Word Health Organization the individuals with higher body mass index (BMI) level are at risk of developing type-1 and type-2 diabetes as well as cardiovascular diseases (Asonye, 2023). Similarly, unhealthy eating habits, limited exercise also increase the risk of obesity and type-2 diabetes among adults. This is because the individual with imbalance body mass index (BMI) or obesity develop insulin resistance, which leads them to impaired insulin actions in the liver or minimize the glucose uptake in the muscles and fats (Rizvi, 2024).

Concept of Psycho-Diabetic Distress

Psycho-Diabetic distress refers to the emotional and psychological challenges linked to the management and experience of living with diabetes. This encompasses feelings of frustration, anxiety, and burnout linked to the daily demands of diabetes management, such as blood glucose monitoring, medication adherence, and managing complications (Kreider, 2017). The fundamental feature of Diabetic Distress is the emotional load that diabetic patients face. Diabetes management can result in emotional difficulties such as guilt, humiliation, helplessness, exhaustion, and restlessness. Such sentiments can have a substantial impact on an individual's general well-being, sometimes leading to avoidance behaviors that complicate diabetes care and control (Berry et al., 2015).

Diabetic patients also suffer from psychological anomalies such as depression, anxiety and stress. These mental health disorder characterized by persistent sorrow, decreased interest in activities, and a range of physical and cognitive symptoms. It is not restricted to any one ailment or situation, including diabetes. Psychological distress commonly co-occurs with diabetes, potentially exacerbating the challenges associated with disease care (Kaur et al., 2018). Psychological distress differs from diabetic distress in that persons with depression may suffer chronic sorrow, defined as

a broad sense of melancholy or hopelessness that lasts at least two weeks. Similarly, a sad person may lose interest in everyday tasks or find pleasure in formerly delightful activities (Dalsgaard et al., 2024).

Literature Review

Recently, during a scoping review, Tareen (2024) looked at the diabetic population in Pakistan and their glycemic control status. In addition, they polled Pakistani citizens on their diabetes awareness, treatment adherence, and the frequency of complications. High complication rates and substantial economic burdens are a result of patients with Type 2 diabetes mellitus in Pakistan having poor glycemic control, insufficient diabetes knowledge, and inconsistent treatment adherence. This underscores the necessity for strategies to modify lifestyles and changes in policies.

The demographic distribution and chronic consequences of diabetes were investigated by Khan et al. (2024) by an assessment of the prevalence of diabetes mellitus in Buner District, Pakistan. Buner District, Pakistan has a high rate of diabetes mellitus, with cardiovascular was disease. They used demographic data to investigate how 374 people in Bahawalpur, Pakistan, dealt with diabetes and its effects on their care. It is clear that lower socioeconomic groups require specialized treatments due to the strong relationships shown between income, education, and adherence to diabetes management procedures.

In a similar vein, Javaid et al. (2024) highlighted the significance of reducing socioeconomic obstacles and educational gaps in order to enhance diabetes treatment and health outcomes for marginalized groups. The researchers in this Pakistani study looked at the rates of diabetes and how well people with and without degrees managed their condition. This goal was achieved by conducting a cross-sectional research in both urban and rural regions. To gain a more nuanced picture of the difficulties experienced by various demographic groups, we used structured interviews to collect detailed information on participants' diabetes knowledge, management strategies, and access to healthcare services. The results showed that the prevalence of diabetes is 25% in the uneducated population and 15% in the educated population. The results showed that people without a college degree had worse awareness and management (Verma et al., 2025).

Similarly, another study looked at the socio-demographic traits of people with type-2 diabetes who had just been diagnosed. the role of socioeconomic variables in diabetes treatment, showing that those with low means and access to healthcare have an even harder time keeping their disease under control. Results showed that type 2 diabetes is more common in middle-aged, overweight women from low-income backgrounds who report with osmotic symptoms, have a HbA1c of 9.62%, and have no history of the disease in their families (52% of patients) (Qayyum et al., 2024).

Another cause of diabetes among adults is unhealthy body mass index (BMI). Obesity refers to the extreme accumulation of fat tissues in different parts of the individual body organs. This is known as ectopic fat in the human body. It is because of the poor metabolic and unhealthy life style consequences which lead to the type-2 diabetes (Kaur et al., 2018). The disturbed nutrient signals, obesity or unhealthy fats stored in the body are the cause of type-2 diabetes that leads to mental health issues, poor physical health and psychological and cognitive issues among the individuals having age 70 and above (Aslam et al., 2022).

Rationale of the Study

The rationale for this study is rooted in the growing recognition of the interplay between diabetes and mental health, particularly within the context of Pakistan, where both conditions are prevalent yet often under-addressed. This is obvious that diabetic patients frequently experience psychological challenges such as depression, anxiety, and stress, which can exacerbate their physical health issues and further leads to diabetic distress such as emotional imbalance, irritability etc. Exploring these issues in connection with different measures of body mass index (BMI) or Glycated Haemoglobin (Hba1c) is rare. This study carried out to fill a huge gape in literature to explore the links of psychological and diabetic distress in connection with different measures of body mass index (BMI) and Glycated Haemoglobin (Hba1c) among the diabetic patients.

Objectives of the Study

1. To check and compare the level of psycho-diabetic distress among different types of diabetic patients across different measures of body mass index (BMI) or Glycated Haemoglobin (Hba1c).

Hypothesis of the Study

1. Level of psycho-diabetic distress will significantly differ among different types of diabetic patients across different measures of body mass index (BMI) or Glycated Haemoglobin (Hba1c).

Research Methodology

This study was aimed to explore the psychological and diabetic distress among diabetic patients. To evaluate the objectives and to testify the hypothesis of this study, the researcher used different methods. The method or material used in this study is as follows:

Participants of the Study

The participants of this study were the (N=198) diabetic patients belonging from diversified demographic characteristics. All the participants were diagnosed patients recruited from three hospitals of South Punjab, Pakistan i.e. Bahawal Victoria Hospital, Civil Hospital Bahawalpur and Nishtar Medical Hospital Multan.

Research Design of the Study

This study was quantitative with cross-sectional research design. In this study a sample of (N=198) diabetic patients was included who were diagnosed patients however different levels of Glycated Haemoglobin (Hba1c) or Body Mass Index (BMI) was gained by the researcher as a part of this study. This sample was recruited by using purposive sampling method and sample size was rationalized by using online G. Power calculator.

Measurement Scales Used in this Study

To quantify the variables of the study two valid and reliable scales with different facets were utilized. The first scale was a DASS-42 item which was initially developed by Lovibond and Lovibond (1995). In this research, Urdu translated version of U- DASS 42 items which was translated and adapted by Husain and Gulzar (2020). The second was Diabetic Distress Screening scale (DDSS) with different facets that significantly measure the level of diabetic distress. This scale consists of 17 measuring various types of diabetic distress.

Inclusion and Exclusion Criteria

In this study the diagnosed patients with pre-diabetes, type-1 and type-2 diabetes with different measures of body mass index (BMI) or with age range of 30-70 years were included. The individuals below 30 or above 70 or with normal Glycated Haemoglobin (Hba1c) were excluded.

Ethical Consideration

This research study follows the American Psychological Association (APA) ethical guidelines. Prior to collect the data, informed consent was taken from the study participants and they were briefed that there is no risk of harm in this study. They were also told that the findings of the study will be kept as confidential and will be used for research purpose only.

Results of the study

The collected data was analyzed by using SPSS and the results are as follows:

Table 1: *Psycho- Diabetic Distress Measures among Pre-Diabetic Patients across Different Glycated Haemoglobin (HbA1c) Level*

Diabetes Type	Measure	5.7% - 6.4%		>6.5%		*T*	*P*	Cohen's *d*
		M	*SD*	*M*	*SD*			
Pre-diabetes	Depression	31.78	4.39	25.08	6.61	4.33	<.001	1.38
	Anxiety	30.76	5.04	26.67	5.38	2.52	.014	0.80
	Stress	32.93	5.71	31.08	5.28	1.02	.310	0.33
	Emotional Burden	4.31	1.09	3.45	0.76	2.60	.012	0.83
	Physical Distress	4.37	1.19	3.48	0.81	2.46	.017	0.79
	Regimen Distress	4.31	1.14	3.46	0.78	2.45	.017	0.78
	Interpersonal Distress	4.33	1.10	3.46	0.77	2.60	.012	0.83
	Diabetes Distress	17.34	4.45	13.84	3.13	2.58	.012	0.82

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Glycated Haemoglobin (Hba1c) among pre-diabetic patients.

Table 2: *Psychological and Diabetic Distress Measures among Type-1 Diabetic Patients across Different Glycated Haemoglobin (HbA1c) Level*

Diabetes Type	Measure	5.7% - 6.4%		>6.5%		*T*	*P*	Cohen's *d*
		M	*SD*	*M*	*SD*			
Type 1	Depression	31.64	4.57	31.71	4.30	-0.05	.960	-0.02
	Anxiety	27.82	5.79	29.95	5.23	-1.21	.231	-0.40
	Stress	34.55	4.28	33.87	4.51	0.46	.650	0.15
	Emotional Burden	4.15	1.10	4.08	1.03	0.21	.833	0.07
	Physical Distress	4.29	1.18	4.25	1.19	0.11	.917	0.04
	Regimen Distress	3.98	1.27	4.13	1.11	-0.41	.685	-0.14
	Interpersonal Distress	4.19	1.12	4.12	1.05	0.19	.853	0.06
	Diabetes Distress	16.85	4.51	16.62	4.27	0.17	.869	0.06

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Glycated Haemoglobin (Hba1c) among diabetic patients with Type-1

Table 3: *Psychological and Diabetic Distress Measures among Type-2 Diabetic Patients across Different Glycated Haemoglobin (HbA1c) Level*

Diabetes Type	Measure	5.7% - 6.4%		>6.5%		*t*	*p*	Cohen's *d*
		M	*SD*	*M*	*SD*			
Type 2	Depression	41.63	6.97	31.34	4.00	6.16	<.001	2.32
	Anxiety	37.75	9.87	26.83	6.61	4.11	<.001	1.55
	Stress	36.63	7.37	30.79	4.51	3.15	.002	1.19
	Emotional Burden	5.44	0.83	4.17	0.96	3.53	.001	1.33
	Physical Distress	5.66	0.69	4.28	0.97	3.90	<.001	1.47
	Regimen Distress	5.55	0.70	4.04	1.04	3.97	<.001	1.50
	Interpersonal Distress	5.49	0.76	4.20	0.94	3.71	<.001	1.40
	Diabetes Distress	22.14	2.86	16.88	3.75	3.81	<.001	1.44

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Glycated Haemoglobin (Hba1c) with Type-2 diabetes

Table 4: *Comparison of Psychological and Diabetic Distress Across Different Measures of BMI Groups among Pre-Diabetic Patients*

Diabetes Type	Measures	Underweight		Healthy Weight		Overweight		Obese		*F*	*p*	η^2
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*			
Pre-diabetes	Depression	28.00	5.02	30.33	5.66	30.25	5.92	32.40	4.45	1.04	.379	.048
	Anxiety	28.33	6.12	30.10	5.23	29.75	5.25	31.00	5.52	0.38	.765	.018
	Stress	31.17	5.85	32.29	6.51	33.67	4.44	31.87	6.27	0.51	.677	.024
	Emotional Burden	3.68	1.24	4.00	1.04	4.35	1.14	4.24	1.00	0.81	.493	.038
	Physical Distress	3.76	1.36	3.96	1.17	4.39	1.21	4.44	1.09	0.99	.406	.045
	Regimen Distress	3.72	1.30	3.94	1.06	4.37	1.16	4.29	1.11	0.90	.446	.042
	Interpersonal Dis	3.70	1.27	3.99	1.06	4.36	1.15	4.29	1.00	0.85	.470	.040
	Diabetes Distress	14.87	5.16	15.93	4.31	17.47	4.63	17.31	4.04	0.89	.453	.041

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Body Mass Index (BMI) among pre-diabetic patients.

Table 5: *Comparison of Psychological and Diabetic Distress Across Different Measures of BMI Groups among Type-1 Diabetic Patients*

Diabetes Type	Measures	Underweight		Healthy Weight		Overweight		Obese		*F*	*p*	η^2
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*			
Type 1	Depression	34.17	4.07	31.36	3.76	31.13	4.92	31.77	4.47	0.79	.505	.037
	Anxiety	35.00	4.15	29.77	4.91	27.50	5.76	29.45	4.96	3.17	.030*	.133
	Stress	33.00	5.62	34.73	4.20	34.63	4.46	33.05	4.43	0.73	.537	.034
	Emotional Burden	3.74	1.27	4.03	1.04	3.95	1.00	4.36	1.00	0.87	.462	.040
	Physical Distress	4.14	1.80	4.19	1.13	4.15	1.12	4.43	1.14	0.24	.867	.012
	Regimen Distress	3.94	1.48	4.02	1.14	4.05	1.01	4.28	1.15	0.26	.853	.012
	Interpersonal Dis	3.84	1.36	4.07	1.06	4.00	0.99	4.38	1.02	0.68	.569	.032
	Diabetes Distress	15.64	5.81	16.38	4.28	16.15	4.00	17.57	4.16	0.54	.655	.026

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Body Mass Index (BMI) among Type-1 diabetic patients.

Table 6: *Comparison of Psychological and Diabetic Distress across Different Measures of BMI Groups among Type-2 Diabetic Patients*

Diabetes Type	Measures	Underweight		Healthy Weight		Overweight		Obese		*F*	*p*	η^2
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*			
Type 2	Depression	35.14	2.41	31.78	4.07	32.21	5.54	32.77	7.12	0.65	.585	.031
	Anxiety	27.57	7.70	28.61	5.98	28.63	7.81	27.55	9.59	0.10	.962	.005
	Stress	32.29	2.87	30.94	4.98	30.79	6.39	32.32	5.07	0.41	.750	.019
	Emotional Burden	4.71	0.76	4.21	0.90	4.21	1.18	4.40	1.08	0.52	.673	.024
	Physical Distress	4.79	0.61	4.34	0.92	4.43	1.25	4.45	1.07	0.31	.819	.015
	Regimen Distress	4.75	0.67	4.05	1.03	4.32	1.18	4.12	1.24	0.76	.519	.036
	Interpersonal Dis	4.73	0.71	4.25	0.87	4.26	1.18	4.41	1.07	0.46	.710	.022
	Diabetes Distress	18.98	2.70	17.07	3.46	17.22	4.72	17.69	4.27	0.42	.739	.020

Note: The above table shows the comparison of psychological and diabetic distress among diabetic patients across different measures of Body Mass Index (BMI) among Type-2 diabetic patients.

Findings and Discussion

This study was conducted to explore the psycho-diabetic distress among diabetic patients with different types and measures of Glycated Haemoglobin (Hba1c) level or Body Mass Index (BMI). It was hypothesized that "Level of psycho-diabetic distress will significantly differ among different types of diabetic patients across different measures of body mass index (BMI) or Glycated Haemoglobin (Hba1c)". The results from the collected data revealed that psycho-diabetic distress was higher among the patients with pre-diabetic symptoms whose Glycated Haemoglobin level was from 5.7%-6.4% as compared with those who reported Glycated Haemoglobin level from above 6.5%. Similarly, no significant differences in the level of psycho-diabetic distress were found among the patients with type-1 diabetes. However, among the patients with type-2 diabetes the overall level of psycho-diabetic distress was higher among those who reported Hba1c level from 5.7%-6.4% as compared with those who reported Hba1c level above 6.5%.

The key findings suggest that BMI groups do not show significant differences in most psycho-diabetic distress measures, with a few notable exceptions. For individuals with Type 1 diabetes, significant differences were observed for anxiety ($p = .030$, $\eta^2 = .133$). For pre-diabetes and Type 2 diabetes groups, no statistically significant differences were found across BMI groups for any of the measures. However, some trends suggest that higher BMI groups tend to report slightly higher levels of depression and diabetes-related distress, though these differences did not reach statistical significance. Moreover, for pre-diabetes and Type 2 diabetes, BMI-related differences in psychological and behavioral outcomes appear minimal. The results of this study are in line with the previous researches such as Aslam et al., (2022) conducted a study to compare the psycho-diabetic distress among diabetic patients and concluded higher level of distress among the pre-diabetic patients at their initial diagnoses having Hba1c level from 5.7%-6.4%. Similarly, another

study revealed a higher level of distress among diabetic patients particularly those with underweight (Javaid et al., 2024).

Conclusion

On the basis of the findings from this study this concluded that the diabetic patients are suffering different types of psychological and diabetic distress which is related with different diabetic types or measures of body mass index. As this study revealed a significant connection between the variables therefore addressing psychological and diabetic distress is crucial to manage the mental health of diabetic patients. The authorities should notice these psychological issues and start curative steps to manage the diabetic and psychological distress of the patents.

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