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ILLNESS PERCEPTIONS, MEDICATION ADHERENCE AND QUALITY OF LIFE IN INDIVIDUALS WITH TYPE 2 DIABETES

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Abstract

The purpose of this study was to explore illness perceptions, adherence to medication and quality of life in people with Type 2 diabetes. The data was collected using a quantitative descriptive and correlational survey research design, with non-probability purposive sample of diagnosed adult Type 2 diabetic patients in Lahore, Pakistan. The Brief Illness Perception Questionnaire (BIPQ) developed by Broadbent et al. (2006), Diabetes Medication Adherence Scale (DMAS-7) developed by Mallah et al. (2019) and Revised Version of Diabetes Quality of Life (RV-DQOL13) developed by Bujang et al. (2018) were the three standardized scales administered. SPSS was used for statistical analyses, which consisted of descriptive statistics, Independent Samples t-tests and One-Way ANOVA with Post-Hoc Tukey HSD comparisons. The descriptive findings confirmed that the sample had a moderate baseline level of medication adherence (M = 5.08, SD = 1.46) and quality of life (M = 26.97, SD = 4.29). For the illness perception, inferential testing indicated that there was a significant difference between men and women, with the females having a higher illness perception than the males; no significant difference was found between the formal education levels and any of the variables. Most importantly, age and the specific treatment modalities were highly significant only for medication adherence, with younger age groups showing significantly lower adherence, and patients with more complex insulin injection regimens showing significantly poorer adherence than those taking a single oral tablet. These results generate important awareness on adherence and quality of life and offer guidelines for the design of specific psychological interventions and simplified adherence routines for healthcare organizations, policy makers, healthcare providers and caregivers.

Introduction

Diabetes is a chronic metabolic disorder that is caused by inadequate insulin secretion from the pancreas or inadequate use of insulin by the body. Insulin is an essential hormone that helps control blood sugar levels. Untreated diabetes usually leads to hyperglycemia or high blood glucose, leading to a gradual worsening of the damage to a number of physiological systems, including the nervous system and the vascular system (World Health Organization [WHO], 2024).

According to (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2023). Diabetes mellitus is defined as increased blood glucose levels, representing the main chemical energy source available from food and self-produced. The insulin hormone, which is secreted by the pancreas, assists in the uptake of glucose to cellular structures for metabolic utilization under

normal physiological conditions. In diabetic pathologies, however, the secretion or utilization of insulin is defective and the glucose level rises in the blood instead of being used by the cells.

Type 1 diabetes, formerly known as childhood-onset or insulin-dependent diabetes (IDD), is a condition in which the body is unable to make enough insulin, a hormone needed to regulate blood sugar, so people with type 1 must take insulin everyday to survive. In 2017, the total global burden of Type 1 diabetes was 9 million, mostly in wealthier economies. As of now, the causes of this condition are still not understood, and there are no prevention protocols (WHO, 2024).

Type 2 diabetes is a disease that disrupts the way glucose is used to generate energy in the body. Insulin resistance is a condition where the body is unable to respond properly to insulin leading to a very high blood sugar level if treatment is not started. Long-term hyperglycemia causes a broad spectrum of systemic physiological changes, especially affecting the vascular and nervous systems which are particularly susceptible to damaging effects of prolonged hyperglycemia (WHO, 2024).

The incidence of diagnosed diabetes in adult Americans has more than doubled over the past 20 years and therefore significantly increased the national burden of public health in the United States (CDC, 2024). It is estimated that about 38 million adults in the U.S. have the disease and about 20 percent of them are undiagnosed. Diabetes is now the 8th largest cause of death in the country: 90% to 95% of the cases are Type 2 diabetes, and 5% to 10% are Type 1. Moreover, the disease is the leading cause of renal failure and non-traumatic lower extremity amputation and am new onset blindness in adults, making the need for better screening, prevention, and treatment a priority for action (CDC, 2024).

Belief about diabetes is a very strong determinant for the long-term behaviours of people with type 2 diabetes. This metabolic disorder has a slow progression and sometimes no early symptoms, so the patient must regulate daily according to the model of the disease's progress and impact that he or she has in the mind. Threatening interpretations of diabetes - those in which serious harm is expected - tend to exacerbate emotional turmoil and psychological vulnerability (Aziz et al., 2026). On the other hand, those patients who strongly believe in their control and effectiveness of their treatment, exhibit high scores of self-efficacy and are thus able to manage their health care routines well (Highton, 2025).

Health-related quality of life (HRQoL) is a multidimensional concept that represents the way an individual personally experiences their social, physical and psychological health over the course of a disease. Quality of life is a vital long-term psychological measure of health and adaptation to diabetes treatment for people with Type 2 diabetes that provides information on treatment outcomes beyond biomedical measures. Diabetes management is highly challenging, and the daily management of blood sugar tests, the need for multiple medications, and strict diet management poses ongoing difficulties that often lead to a decline in the quality of life for people living with diabetes (Al-Mula & Al-Asadi, 2025).

Diabetes care is where the mental load of maintaining good glycemic control directly influences a patient's quality of life. The on-going challenge of lifestyle changes, and ongoing self-monitoring can often lead to marked anxiety, depression, and emotional distress. Research indicates that these day-to-day, daily life and self care duties have a profound impact on the quality of life of an individual, and significantly on how they feel about their physical health and overall health condition. Moreover, clinical activities can not be the only determinant of the daily social and environmental quality of life of diabetic people; sociodemographic factors like age, gender, and level of education play a significant role as well (Mortuja et al., 2024).

Rationale

For Type 2 diabetes, treatment is lifelong, and people with the disease should take medications and make lifestyle changes continuously to avoid complications and keep diabetes out of the way. But people's attitudes to their illness, including its seriousness, their control over it and the way it affects their lives, may have a significant impact on

their compliance with prescribed treatments and the management of their illness. The understanding of the interaction between illness perception, medication adherence, and diabetes-specific quality of life is of cardinal importance because it can help to reveal psychological and behavioral factors that can support or impede effective diabetes management. This study will seek to examine these relationships and potentially gain insights to guide interventions to increase adherence, improve quality of life, and, ultimately, decrease the burden of diabetes-related complications.

Aims

The aim of the study is to examine how illness perception tends to affect medication adherence and disease-specific quality of life in individuals with type 2 diabetes. Moreover, the aim is to examine illness perception, medication adherence, and disease-specific quality of life in individuals with type 2 diabetes.

Research Questions

1- What is the level of medication adherence among individuals with diabetes type 2?

2- How do individuals with diabetes type 2 perceive their quality of life?

3- What are the patterns of illness perception, medication adherence, and quality of life across different demographic groups (e.g., age, gender, education and type of treatment) of individuals with diabetes type 2?

Research Design

The study was quantitative in nature. A Descriptive research design was used for the present study. The Survey research method was used. Data were collected through questionnaire. Descriptive and influential statistics were used to analyze the data and to retrieve the results.

Sample and sampling technique

Non-probability purposive sampling technique was used to recruit the sample. The sample comprised 70 participants as estimated by G Power. Participants were recruited as referrals during their OPD visits from different diabetic center of hospitals in Lahore.

Inclusion Criteria

- Diagnosis of type II diabetes for at least one year.
- Participants had a minimum level of literacy or basic understanding of diabetes management.
- Participants must be managing their condition with diet, exercise or medication.

Exclusion Criteria

- Pregnant women were excluded from the study.
- Participants who had undergone surgery due to complication from uncontrolled diabeties i.e. amputations or severe infections were excluded.
- Individuals with significant comorbidities such as cardiovascular disease, chronic kidney disease and any other life-threatening disease were excluded.

Assessment Measures Demographic Information Sheet

A demographic information questionnaire developed by the researcher was used to assess the demographic information of the participants. The demographic information collected included gender, age, years of formal education, marital status, employment status, household income, number of dependents, familial background (rural/urban), family system (joint/nuclear) and others.

Clinical Information Sheet

Medical information collected for patients included basic clinical information such as approximate onset and duration of diabetes, treatment, comorbid physical conditions, obesity and other type of diabetes and the family history of type 2 diabetes.

The Brief Illness Perception Questionnaire by Broadbent et al., (2006)

The Brief Illness Perception Questionnaire (Brief IPQ), developed by Broadbent et al. (2006), is a nine-item measure assessing the cognitive and emotional components of illness perception. Eight

items are rated on a 0–10 scale and one open-ended item captures perceived causes. Because each domain is measured with a single item, Cronbach's alpha is not applicable; instead, reliability was demonstrated through test–retest correlations ranging from .48 to .75 across illness groups. The instrument showed strong concurrent validity through significant correlations with the corresponding subscales of the IPQ-R, and predictive validity was supported by associations with recovery outcomes and treatment engagement. Overall, the Brief IPQ is a brief, reliable, and valid tool for assessing key illness perception dimensions.

Diabetes Medication Adherence Scale (DMAS-7) By Mallah et al., (2019)

The Diabetes Medication Adherence Scale (DMAS-7) developed by Ayoub et al. validated by Mallah et al. 2019 is a 7 items self-report instrument to measure adherence with oral anti-diabetes medication. In response to each item, you will choose either yes or no (with 0 representing "yes" and 1 representing "no"), for a total score of 0 to 7, with 7 representing maximum adherence. The scale had a good internal consistency (Cronbach's $\alpha = 0.63$) and had excellent construct validity, from high correlation with the LMAS-14 scale (Spearman's $\rho = 0.846$) and high level of agreement in adherence classification (Cohen's $\kappa = 0.711$) (Mallah et al., 2019). The DMAS-7 also demonstrated good predictive validity (AUC = 0.675), lending it to the value as a short and valid instrument to measure medication adherence among type 2 diabetes patients.

Revised Version of Diabetes Quality of Life (RV-DQOL13) developed by Bujang et al., (2018)

Bujang et al. (2018) created an improved version of the original 46 item DQoL developed by the Diabetes Control and Complications Trial Research Group (1988) called the Revised Version of the Diabetes Quality of Life Instrument (RV-DQOL13). The authors deleted items due to high percentages of missing responses and redundancy, and tested a shorter form of the instrument with 13 items. This updated version of the scale consists of three domains: Satisfaction (6 items), Impact (4 items), Worry (3 items). Exploratory factor analysis and confirmatory factor analysis were used to extend the construct validity of the questionnaire. The CFA showed strong model fit (CFI = 0.966, TLI = 0.958, RMSEA = 0.049, SRMR = 0.037). The level of reliability of the indicators was satisfactory, with composite reliability scores of 0.92 (Satisfaction), 0.78 (Impact), and 0.79 (Worry). Rasch analysis also confirmed item reliability (0.92–0.99) and good internal consistency (Cronbach's alpha values of 0.93, 0.79 and 0.75, respectively). In summary, the RV-DQOL13 is a short, valid and reliable measure of the QOL of adults living with diabetes.

Procedure

Firstly, we take permissions from departments than we contact relevant department to take permission for data collection. We approach the participant on their OPD visit. Firstly, the purpose of the study was explained to them and a participant information sheet was provided to them and asked them to sign the consent from if they want to participate in the research. Then we provide the questionnaire and informed them that the information they gave kept confidential and informed them they have right to withdrawal anytime from the study without any problem. For statistical analysis we use SPSS 21.0 version. Firstly, the reliability of the scale was the administration than different statistical test like t-test, one-way ANOVA, post HOC. Furthermore, the basic features of the collected data to know descriptive statistics were adopted.

Results

In the first step, missing values were checked but there were no missing values to be filled. Reliability analyses were performed for each scale in the second step, and Cronbach's alpha for them was calculated to confirm the internal consistency of the instruments evaluating illness perception, medication adherence, and quality of life. In the third step, the demographic and study variables were stated as descriptive statistics, using frequencies and percentages for categorical data alongside means and standard deviations for the main variables. In the last step, different analyses

like t-test and ANOVA were done to evaluate group variations across demographic features. Independent samples t-tests were used for two-group evaluations, while One-Way Analysis of Variance (ANOVA) was executed for characteristics with three or more groups. Whenever significant differences were identified, Post Hoc Tukey HSD tests were completed to isolate the precise pairwise differences.

Psychometric Properties of Study Variables (N=70)

Variables	Items of Questionnaire	Cronbach's Alpha
Illness Perception	1-8	.792
Medication Adherence	9-15	.756
Quality of Life	16-28	.706
Overall		0.74

Table 4.2 presents the reliability statistics for the scales utilized in this study, evaluated using Cronbach's alpha coefficients. All subscale Cronbach alpha values are above .70 and are acceptable, with values of .792 for Illness Perception, .756 for Medication Adherence and .706 for Quality of Life. The Cronbach's alpha reliability coefficient for the overall instrument is good, at 0.74. Overall, the results presented here validate the psychometric properties and reliability of all measures for use in the evaluation of psychological and health-related outcomes in people with Type 2 diabetes.

Independent Sample t-test Comparing Gender with Illness Perceptions, Medication Adherence and Quality of life (N=70)

	Male N= 29		Female N= 41		t	p
	M	SD	M	SD		
Illness Perception	43.58	3.77	45.85	4.08	-2.36	.021
Medication Adherence	5.10	1.29	5.07	1.59	.085	.933
Quality of Life	26.89	3.81	27.02	4.65	-.122	.903

An independent samples t-test was used to see how gender affects individuals with Type 2 diabetes. The results showed a significant difference in illness perception (t = -2.36, p = .021), with females scoring higher than males. However, gender does not change medication adherence (t = 0.08, p = .933) or overall quality of life (t = -0.12, p = .903). In short, while women and men look at their illness differently, both genders are statistically identical when it comes to managing their medicine and experiencing daily quality of life.

One- way ANOVA Comparing Age with Illness Perceptions, Medication Adherence and Quality of life (N=70)

Variables		df	Mean Square	F	Sig. P
Illness Perception	Between Group	2	9.84	.58	.561
	Within Group	67	16.89		
Medication Adherence	Between Group	2	14.99	8.54	.001
	Within Group	67	1.75		
Quality of Life	Between Group	2	17.64	.96	.390
	Within Group	67	18..46		

a one-way ANOVA test was used. The results showed that age does not change how patients perceive their illness (F = 0.582, p = .561) or their overall quality of life (F = 0.955, p = .390). However, age has a highly significant impact on how well patients stick to taking their medication (F = 8.544, p < .001). In short, while younger and older patients feel similarly about their diabetes, their age plays a major role in how successfully they manage their medicine routines.

One way ANOVA Comparing Education with Illness Perceptions, Medication Adherence and Quality of life (N=70)

Variables		df	Mean Square	F	Sig. P
Illness Perception	Between Group	5	22.78	1.41	.235
	Within Group	64	16.21		
Medication Adherence	Between Group	5	3.70	1.84	.118
	Within Group	64	2.02		
Quality of Life	Between Group	5	28.56	1.62	.168
	Within Group	64	17.64		

one-way ANOVA was used to see how education affects individuals with Type 2 diabetes. The results showed that education level does not change how patients perceive their illness (F = 1.41, p = .235), how well they stick to their medication (F = 1.84, p = .118), or their overall quality of life (F = 1.62, p = .168). In short, all three aspects remain statistically similar regardless of a patient's formal education level.

One way ANOVA Comparing Treatment for Diabetes with Illness Perceptions, Medication Adherence and Quality of life (N=70)

Variables		Df	Mean Square	F	Sig. P
Illness Perception	Between Group	2	11.81	0.70	.499
	Within Group	67	16.83		
Medication Adherence	Between Group	2	17.17	10.17	.001*
	Within Group	67	1.69		
Quality of Life	Between Group	2	23.75	1.30	.279
	Within Group	67	18.28		

A one-way ANOVA test was used to see how treatment types affect individuals with Type 2 diabetes. The results showed that treatment type does not change how patients perceive their illness (F = 0.70, p = .499) or their overall quality of life (F = 1.30, p = .279). However, treatment type has a highly significant impact on how well patients stick to their medication (F = 10.17, p < .001). To sum up, patients have a similar opinion about their diabetes in all treatment groups, but the type of treatment received has a significant impact on their ability to manage their diabetes medicine.

The post hoc multiple comparisons used for comparing differences among participants' prescribed treatment modalities in illness perception, medication adherence and quality of life were carried out.The post hoc multiple comparisons for the differences between participants prescribed the different treatment modalities were performed for illness perception, medication adherence and quality of life.

Difference in treatment for diabetes based on medication adherence (post hoc Tukey) (N=70)

	Treatment Group (I)	Comparison Group (J)	Mean difference (I-J)	Sig.
IP	Oral medication	Only Insulin	1.49	.790
	Oral medication	Medication + Insulin	1.15	.790
	Only Insulin	Medication + Insulin	0.34	.991
MA	Oral medication	Only Insulin	2.19	**.001**
	Oral medication	Medication + Insulin	0.94	0.59
	Only Insulin	Medication + Insulin	-1.25	.107
QoL	Oral medication	Only Insulin	0.84	.877
	Oral medication	Medication + Insulin	-1.92	.327
	Only Insulin	Medication + Insulin	-2.76	.359

Results from the post-hoc multiple comparison analysis indicate that the type of treatment a patient receives makes a significant difference in adherence to treatment only in terms of medication adherence. In terms of adherence to medication, patients taking oral tablets are more likely to follow them than patients using only insulin injections, which is a very significant result ($p < .001$). But there is no significant difference between taking oral medication compared to combination treatment ($p = .590$), or insulin compared to combination treatment ($p = .107$). In addition, there are no statistically significant differences regarding patient's perception of their illness ($p > .05$) and their perception of overall quality of life ($p > .05$) among the treatment groups, since the scores of each treatment group are not significant.

Discussion

The main purpose of this research was to explore the relationship between illness perception and adherence to care and quality of life for people diagnosed with Type 2 diabetes. The self-regulation of this chronic metabolic illness is a complex process which requires constant and continuous regulation, and this self-regulation process is essential for understanding the mechanisms of behavior and cognition underlying it, which is an important area of health psychology research. How the diabetic patient thinks and feels about the illness, in keeping with the Common-Sense Model, directly influences coping mechanisms and adherence with the illness.

In order to provide an answer to the research questions, several statistical analyses were performed in SPSS. Psychometric reliability testing was first conducted, revealing that all subscales of the instrument had alpha values greater than 0.70, and the overall instrument alpha was 0.74, which was a reliable instrument. Then, descriptive statistics (frequencies, percentages, means and standard deviations) were conducted to describe the sociodemographic and clinical characteristics of the sample. In the analysis of the effect of gender on the main variables an independent samples t-test was performed to assess for group differences. Furthermore, a series of One-Way Analyses of Variance (ANOVA) were conducted to assess and compare the patterns of illness perception, medication adherence and quality of life in several clinically relevant and demographic subgroups (i.e. age, formal educational level, prescribed therapeutic treatments).

These empirical results are strongly consistent with the existing international diabetes literature. The age-dependent differences in medication adherence are similar to the results of Alharbi et al. (2023) who showed that adherence rates are generally low by age group, with younger age groups being most vulnerable to adherence issues, and Polonsky and Henry (2016) who found that younger age was one of the strongest determinants of low adherence rates, because of lifestyle

disruptions and perceived treatment barriers. Likewise, the strong support of a powerful impact of the treatment types on adherence is confirmed by McGovern et al. (2018), who showed adherence rates vary significantly according to drug classes and medical delivery methods. In addition, the strong gender difference in illness perception was consistent with Tang and Gao's (2020) finding that demographic factors alone seem significant predictors of cognitive illness representations. Finally, the inconsistent results with quality of life and demographic characteristics are consistent with the middle to high baseline that was found in other studies of quality of life in diabetic patients from Middle East and Asian countries where the general physical impact of diabetic chronic complications was seen to affect the overall quality of life regardless of age or formal education (Alshayban & Joseph, 2020; Zare et al., 2020).

Strength of the Study

- Supplies much needed and culturally relevant information specifically on Type 2 diabetes patients in Lahore, Pakistan instead of generalizing the western research.
- Employed very specific, internationally validated instruments that are specialized for diabetes management (e.g., DMAS-7, RV-DQOL13) instead of a variety of general, non-specific health questionnaires.
- Links a close relationship between cognition (illness perception) and behavior (adherence) and outcomes (quality of life) in a medical context with success. Demonstrates a strong connection between the patient's illness perception and medical behavior (adherence) and medical outcomes (quality of life) successfully.
- Provides direct and practical suggestions to the local hospital administration, clinical psychologists, and caregivers to help them create simplified treatment processes and psychological counseling models.

Limitations

- Because of strict administrative regulations and security at hospital, data collection was limited to a smaller sample.
- The cross-sectional design is only able to provide one time of measurement and is unable to measure long term changes to behavior.
- Larger sample volume would result in greater statistical precision and stability of the Cronbach's alpha reliability coefficients.

Suggestions

- Further research with larger samples in various clinical contexts is needed to enhance the results' generalizability.
- Early diagnosis clinical cases should be studied in research to explore the initial medication adherence patterns.
- An appropriate design with structured patient follow-ups is recommended to monitor disease progression over time.

Implications of the study

Provides age-specific clinical interventions for students.

Medication adherence is affected by age and pharmacists can develop personalized counseling plans to help younger patients with different disruptions in their routine.

Provides information to Tailored Treatment Counseling

While there are varying degrees of compliance, depending on the nature of the treatment, clinicians can give proactive behavioral support when moving patients from oral medications to complex insulin treatment.

Accepts Differences in Patient Outlook

There is a large difference in level of illness perception that indicates that the women and men patients' thoughts around burden of illness are different, necessitating a gender-sensitive approach to psychological support.

Promotes a Multidisciplinary Care Model

The results of this study show that the effective management of diabetes involves health counseling that is integrated into medical care to address the cognitive perception of diabetes and its effect on a patient's health behavior.

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