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RELATIONSHIP BETWEEN ILLNESS PERCEPTION, DIABETES-RELATED SELF-EFFICACY, AND DIABETES-RELATED QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS

Original Research

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ABSTRACT

Background: Diabetes mellitus is a chronic condition with profound physiological and psychosocial consequences, where illness perceptions and self-efficacy play crucial roles in disease management and quality of life. Understanding the interplay between these psychological constructs can inform more effective, patient-centred interventions. Limited research in Pakistan has explored these relationships in diverse patient populations, particularly in the Khyber Pakhtunkhwa province, highlighting a gap in the literature.

Objective: To investigate the relationship between illness perceptions, diabetes management self-efficacy, and diabetes-specific quality of life, and to examine their association with demographic variables including gender, age, and education.

Methods: A quantitative correlational design was used. A sample of 150 patients with diagnosed diabetes was recruited from Mardan Medical Complex and DHQ Hospital, using purposive, convenience, and snowball sampling techniques. Participants ranged from 28 to 74 years, with 40% in middle adulthood and 60% in older adulthood. Data were collected using the Revised Illness Perception Questionnaire (IPQ-R), Diabetes Management Self-Efficacy Scale (DMSES), and Diabetes Quality of Life Scale (DQoL). Analyses were conducted using Pearson product-moment correlation and independent samples t-tests.

Results: Significant negative correlations were observed between DMSES scores and the IPQ-R subscales timeline ($r = –0.21$, $p < 0.01$), consequences ($r = –0.35$, $p < 0.01$), cyclic dimension ($r = –0.31$, $p < 0.01$), and emotional representation ($r = –0.69$, $p < 0.01$). DMSES correlated positively with personal control ($r = 0.32$, $p < 0.01$), treatment control ($r = 0.50$, $p < 0.01$), and illness coherence ($r = 0.77$, $p < 0.01$). Male participants reported higher self-efficacy ($M = 103.57$ vs. 86.40, $p < 0.01$), better illness coherence, personal control, and treatment control, and lower DQoL scores, indicating better quality of life, compared to females.

Conclusion: Findings underscore the importance of enhancing self-efficacy and fostering positive illness perceptions to improve diabetes-related quality of life. Gender-specific and age-sensitive interventions may be particularly beneficial in this population.

Keywords: Adult; Diabetes Mellitus; Illness Perception; Pakistan; Quality of Life; Self Efficacy; Sex Factors.

INTRODUCTION

Diabetes mellitus, as defined by the American Diabetes Association (ADA), is a chronic metabolic disorder characterized by impaired insulin production, secretion, or utilization, resulting in persistent hyperglycemia and progressive damage to multiple organ systems, particularly the nerves and blood vessels (1). The burden of diabetes has risen dramatically worldwide, with Pakistan now ranked third in global prevalence after China and India (2). Recent national estimates indicate that 11.77% of Pakistan's population is affected, with higher prevalence in men (11.20%) than women (9.19%) and in urban (14.81%) compared to rural areas (10.34%). Provincial data reveal considerable variation, with the highest rates reported in Sindh (16.2% in men, 11.70% in women) and notable urban–rural disparities (3). These epidemiological patterns highlight diabetes as a major public health challenge in Pakistan, necessitating targeted interventions. Beyond its physiological manifestations, diabetes significantly impacts patients' psychological, emotional, and social well-being. Illness perception, defined as an individual's beliefs, emotional responses, and cognitive interpretations about their condition, plays a pivotal role in shaping coping behaviors, treatment adherence, and overall quality of life (4). The Illness Perception Questionnaire (IPQ) conceptualizes these beliefs across multiple dimensions, including perceived causes, timeline, consequences, personal control, treatment control, coherence, and emotional representation (5). Evidence suggests that individuals with a positive perception of their illness and treatment are more likely to engage in effective self-care behaviors and maintain a better health-related quality of life (HRQoL) (6). Conversely, negative illness perceptions are linked to emotional distress, poorer adherence, and diminished life satisfaction (7).

Self-efficacy, defined as the belief in one's ability to successfully execute behaviors necessary for health management, is a key determinant of effective diabetes control (8). Higher self-efficacy has been associated with improved glycemic regulation, greater treatment adherence, and enhanced HRQoL, whereas low self-efficacy correlates with greater disease burden and poor outcomes (9). Importantly, self-efficacy is modifiable through patient education, behavioral interventions, and supportive healthcare environments, making it a promising target for clinical strategies (10). Studies consistently demonstrate that diabetes-related quality of life is strongly influenced by the interplay between illness perception and self-efficacy, with both constructs mediating the psychosocial impact of the disease (11). While numerous investigations have examined the physical complications and distress associated with diabetes, relatively fewer have explored the positive psychological constructs—such as adaptive illness perceptions and high self-efficacy—that may buffer against the disease's detrimental effects (12,13). Moreover, gender disparities, educational influences, and treatment modalities (oral hypoglycemic agents versus insulin therapy) remain underexplored in this context. Previous research indicates that women may experience greater emotional distress and poorer glycemic control compared to men (14,15), while higher education is linked to better self-management and survival outcomes (16). These demographic and treatment-related differences underscore the need for more nuanced investigations that integrate psychosocial and biomedical perspectives. Given the chronic and life-altering nature of diabetes, understanding how patients perceive their illness and their confidence in managing it is critical for designing effective interventions. The present study seeks to address this gap by examining the relationship between illness perception and diabetes management self-efficacy, and their collective impact on diabetes-related quality of life among patients in Pakistan. It also aims to explore the influence of demographic variables—including age, gender, education, and treatment type—on these relationships. By identifying psychosocial determinants that can be modified through targeted interventions, this research aspires to contribute to the development of patient-centered strategies that improve both clinical outcomes and overall well-being in individuals living with diabetes.

METHODS

The present study employed a qualitative research design to explore the relationship between illness perception, diabetes management self-efficacy, and diabetes-related quality of life. Data were collected over a period of five months from diabetic patients attending outpatient departments (OPDs) and wards at Mardan Medical Complex, Darul Shifa Hospital Mardan, and Hayatabad Medical Complex Peshawar. The sample comprised 150 patients, diagnosed with diabetes through standard laboratory tests, recruited using a combination of snowball and convenience sampling techniques. Hospital administrations facilitated the identification of potential participants. The age range of participants was 28–74 years, encompassing middle-aged to older adults, and representing diverse educational, socioeconomic, and professional backgrounds. Inclusion criteria required participants to have a confirmed diagnosis of diabetes and a minimum level of education sufficient to independently complete the study questionnaires. Illiterate patients with limited comprehension

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of English and those unable to respond due to mental or physical disabilities were excluded. Ethical approval was obtained from the relevant institutional review board and the objectives, procedures, and voluntary nature of participation were explained to both the hospital authorities and the patients. Written informed consent was obtained from all participants before data collection. They were assured of anonymity and confidentiality, and informed of their right to withdraw at any stage without any penalty. Demographic information was collected prior to the administration of study measures. Three standardized instruments were used for data collection. The Revised Illness Perception Questionnaire (IPQ-R) developed by Moss-Morris was used to assess patients' cognitive and emotional representations of their illness. The IPQ-R consists of 38 items covering seven subscales: treatment control, personal control, illness coherence, timeline, timeline cyclical, consequences, and emotional representation. Items are rated on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Higher scores on identity, timeline, consequences, and cyclical dimensions reflect more negative illness perceptions, while higher scores on personal control and treatment control indicate more positive beliefs. Several items are reverse-scored, and internal consistency for the subscales has been reported between 0.79 and 0.89 (17).

Self-efficacy for diabetes management was measured using the Diabetes Management Self-Efficacy Scale (DMSES) developed in the UK by Sturt. This self-administered instrument comprises 15 items, each rated on an 11-point Likert scale, with higher scores indicating greater self-efficacy. The scale has demonstrated high reliability, with an overall Cronbach's alpha of 0.89 (18). Diabetes-related quality of life was assessed using the Diabetes Quality of Life (DQoL) instrument developed by Bujang, which consists of 13 items divided into three subscales: satisfaction, impact, and worry. Each item is rated on a five-point Likert scale, where higher scores indicate poorer quality of life. Reported internal consistencies for the subscales are 0.92 for satisfaction, 0.78 for impact, and 0.79 for worry (19). Data scoring was performed according to the standardized scoring protocols of each instrument, and statistical analyses were conducted using IBM SPSS Statistics version 21. Descriptive statistics were computed for demographic and clinical characteristics, and appropriate inferential tests were planned to examine relationships between study variables.

RESULTS

The study included 150 participants, with an equal gender distribution of 50% males and 50% females. The age range was 28–74 years, divided into middle adulthood (28–50 years) at 40% and older adulthood (51–74 years) at 60%. Educational attainment showed that 31.3% of participants had intermediate-level education or below, while 68.7% held bachelor's or master's degrees. The majority resided in urban areas (68%), while 32% were from rural areas. Employment status was evenly split between employed (50%) and unemployed (50%). Most participants were married (79.3%), with smaller proportions being single (12.7%) or divorced (8%). Regarding treatment type, 69.3% reported the use of oral hypoglycemic agents, while 30.7% were insulin dependent. The reliability analysis demonstrated acceptable to excellent internal consistency across all study scales and subscales. Cronbach's alpha coefficients for the Revised Illness Perception Questionnaire (IPQ-R) subscales were as follows: timeline = 0.84, consequences = 0.88, personal control = 0.83, treatment control = 0.88, illness coherence = 0.95, timeline cyclical = 0.65, and emotional representation = 0.95. The Diabetes Management Self-Efficacy Scale (DMSES) showed a reliability of 0.92. The Diabetes Quality of Life (DQoL) instrument demonstrated high internal consistency overall ($\alpha = 0.95$), with subscale reliabilities of satisfaction = 0.93, impact = 0.90, and worry = 0.84. Descriptive statistics revealed that mean scores for the IPQ-R subscales ranged from 14.61 ± 2.83 (timeline cyclical) to 21.49 ± 4.99 (personal control). The DMSES had a mean score of 94.99 ± 35.80, while the overall DQoL score was 33.63 ± 14.14, with subscale means of 14.87 ± 6.96 (satisfaction), 11.20 ± 4.83 (impact), and 7.56 ± 3.50 (worry). Actual score ranges closely reflected potential ranges for most measures, indicating adequate scale utilization.

Correlation analyses identified multiple significant relationships among study variables. Illness perception dimensions were interrelated, with the timeline subscale positively associated with consequences ($r = 0.59$, $p < 0.01$) and emotional representation ($r = 0.56$, $p < 0.01$), but negatively associated with treatment control ($r = –0.40$, $p < 0.01$). Emotional representation exhibited strong positive correlations with consequences ($r = 0.74$, $p < 0.01$) and strong negative correlations with self-efficacy ($r = –0.69$, $p < 0.01$) and all DQoL domains ($r = –0.71$ to $–0.79$, $p < 0.01$). The DMSES was significantly negatively correlated with overall DQoL scores ($r = –0.73$, $p < 0.01$) and with each of its domains, indicating that higher self-efficacy was associated with better quality of life. Strong intercorrelations were also noted among DQoL subscales, particularly between satisfaction and impact ($r = 0.79$, $p < 0.01$). Gender comparisons revealed significant differences in several variables. Males reported higher scores for self-efficacy (103.57 ± 36.43 vs. 86.40 ± 33.24; $p < 0.01$), personal control (23.08 ± 4.49 vs. 19.91 ± 4.99; $p < 0.01$), treatment control (20.32 ± 5.07 vs. 17.32 ± 5.11; $p < 0.01$), and illness coherence (17.44 ± 6.87 vs. 13.81 ± 6.46; $p < 0.01$). Females scored significantly higher on consequences (19.59 ± 4.28 vs. 17.36 ± 4.34; $p < 0.01$), emotional representation (21.63 ± 7.64 vs. 17.55 ± 7.72; $p < 0.01$), and all DQoL domains: satisfaction (16.84 ± 6.89 vs. 12.89 ± 6.50;

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$p < 0.01$), impact (12.47 ± 4.80 vs. 9.93 ± 4.56; $p < 0.01$), and worry (8.99 ± 3.50 vs. 6.13 ± 2.88; $p < 0.01$). No significant gender differences were observed in timeline and timeline cyclical dimensions.

Table 1: frequency % of study variables and their categories (N=150)

Characteristics	f (%)
Gender	
Male	75 (50)
Female	75 (50)
Age	
28-50 (mid adult)	60 (40)
51-74 (older adults)	90 (60)
Education	
Intermediate & below	47 (31.3)
Bachelors & masters	103 (68.7)
Marital status	
Married	119 (79.3)
Single	19 (12.7)
Divorced	12 (8)
Occupation	
None	55 (36.7)
Employee	95 (63.3)
Area of residence	
Rural	102 (68.0)
Urban	48 (32.0)
Screening status	
Uncontrolled	44 (29.3)
Controlled	106 (70.7)
Type of treatment	
Oral pills	104 (69.3)
Insulin dependence	46 (30.7)

Table 2: Cronbach's Alpha Reliabilities Coefficients of the Study Variables (N=150)

Scales	Number	A	M	SD	Range		Skewness	Kurtosis
					(Potential)	(Actual)		
IPQTIM	6	.84	20.75	5.96	6-30	6-30	0.93	0.03
IPQCON	6	0.88	19.66	6.47	6-30	10-27	-0.15	-0.91
IPQPC	6	0.83	21.49	4.99	6-30	7-30	-0.68	0.11
IPQTC	5	0.88	18.82	5.29	5-25	5-25	-0.91	0.06
IPQIC	5	0.95	15.63	6.89	5-25	5-25	-0.19	-1.40
IPQTIMC	4	0.65	14.61	2.83	4-20	5-20	-0.86	1.23
IPQER	6	0.95	19.59	7.92	6-30	6-30	-0.17	-1.36
DMSES	15	0.92	94.99	35.80	0-150	25-149	-0.33	-1.16
DQOL	13	0.95	33.63	14.14	13-65	13-61	0.36	-1.21
DQOLSAT	6	0.93	14.87	6.96	6-30	6-28	0.50	-1.16
DQOLIMP	4	0.90	11.20	4.83	4-20	4-20	0.21	-1.28
DQOLWOR	3	0.84	7.56	3.50	3-15	3-15	0.32	--1.05

Note: IPQ = Illness Perception; IPQTIM = Timeline; IPQCON = Consequences; IPQPC = Personal Control; IPQTC = Treatment Control; IPQIC = Illness Coherence; IPQTIMC = Timeline Cyclical; IPQER = Emotional Representation; DMSES = Diabetes management self-efficacy scale; DQoL = Diabetes quality of life; DQoLSAT = Satisfaction domain (DQoL); DQoLIMP = Impact domain (DQoL); DQoLWOR = Worry domain (DQoL).

Table 3: Correlation Matrix of Scales and Subscale (N = 150)

Variables	2	3	4	5	6	7	8	9	10	11	12
1.IPQTIM	.59**	-.21**	-.40**	-.45**	.41**	.56**	-.49**	.44**	.59**	.53**	.55**
2.IPQCON	-	-.35**	-.54**	-.68**	.40**	.74**	-.63**	.67**	.75**	.69**	.76**
3.IPQPC		-	.73**	.40**	-.03	-.34**	.32**	-.37**	-.37**	-.44**	-.42**
4.IPQTC			-	.57**	-.12**	-.59**	.50**	-.60**	-.62**	-.64**	-.67**
5.IPQIC				-	-.27**	-.73**	.77**	-.78**	-.75**	-.73**	-.82**
6.IPQTIMC					-	.36**	-.31**	.36**	.49**	.29**	.42**
7.IPQER						-	-.69**	.71**	.75**	.73**	.79**
8.DMSES							-	-.73**	-.67**	-.67**	-.76**
9.DQOLSAT								-	.79**	.73**	.94**
10.DQOLIMP									-	.78**	.92**
11.DQOLWOR										-	.87**

Note. *p < .05, **p < .01,

Table 4: Mean Differences in Gender among Variable of the study (N = 150)

Variables	Male		Females				95% CI		Cohen's
	M	SD	M	SD	t(148)	p	LL	UL	D
IPQTIM	19.96	5.96	21.53	5.89	1.62	.11	-3.49	.34	-
IPQCON	17.36	4.34	19.59	4.28	3.16	.00	-3.62	-.83	.52
IPQPC	23.08	4.49	19.91	4.99	4.09	.00	1.64	4.70	.67
IPQTC	20.32	5.07	17.32	5.11	3.61	.00	1.36	4.64	.59
IPQIC	17.44	6.87	13.81	6.46	3.33	.00	1.47	5.78	.54
IPQTIMC	14.45	2.30	14.77	3.28	.69	.49	-1.23	.59	-
IPQER	17.55	7.72	21.63	7.64	3.25	.00	-6.56	-1.60	.53
DMSES	103.57	36.43	86.40	33.24	3.02	.00	5.92	28.42	.49
DQOL	28.96	12.89	38.29	13.89	4.27	.00	-13.66	-5.01	.69
DQOLSAT	12.89	6.50	16.84	6.89	3.61	.00	-6.11	-1.78	.59
DQOLIMP	9.93	4.56	12.47	4.80	3.31	.00	-4.04	-1.02	.54
DQOLWOR	6.13	2.88	8.99	3.50	5.45	.00	-3.89	-1.82	.89

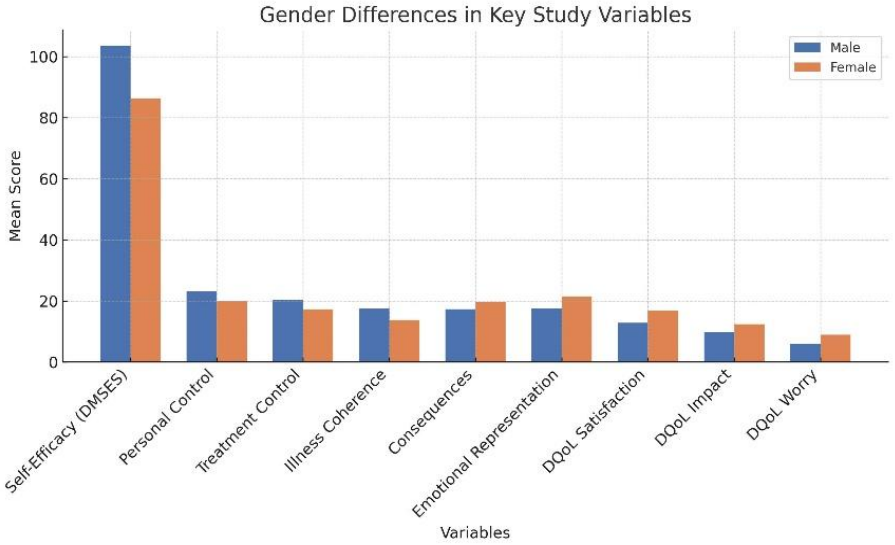

Figure 1 Gender Differences in Key Study Variables

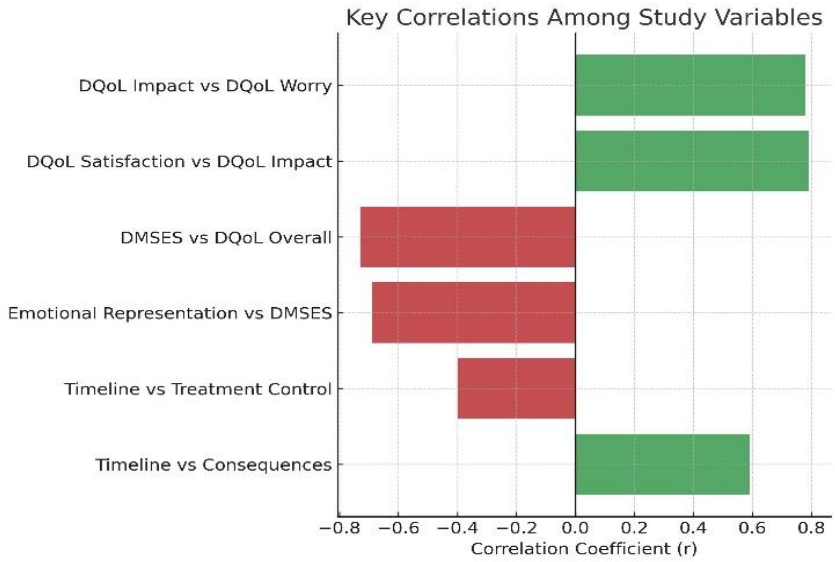

Figure 2 Key Correlations Among Study Variables

DISCUSSION

The present study examined the interrelationships between illness perception, diabetes management self-efficacy, and diabetes-related quality of life, while also exploring the influence of demographic variables such as gender, age, education, occupation, marital status, area of residence, screening status, and treatment type. The findings demonstrated that positive illness perceptions—particularly greater personal control, treatment control, and illness coherence—were associated with higher self-efficacy and better quality of life. Conversely, negative illness perceptions, including stronger beliefs in a prolonged timeline, greater perceived consequences, cyclical nature of symptoms, and heightened emotional representation, were related to lower self-efficacy and poorer quality of life. These associations align with previous evidence indicating that patients who perceive their illness as manageable and understandable are more likely to engage in effective self-care behaviors and experience better health-related outcomes (19,20). The observed strong positive

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correlation between self-efficacy and the positive subscales of illness perception suggests that individuals with greater confidence in their diabetes management skills also maintain a more optimistic view of treatment effectiveness and personal agency in managing the disease. This supports prior research demonstrating that higher self-efficacy facilitates adherence to dietary, physical activity, and medication regimens, ultimately leading to improved metabolic control and reduced complications. Similarly, the inverse relationship between self-efficacy and negative illness perceptions underscores the detrimental effect of perceiving diabetes as uncontrollable or permanent, which can discourage active engagement in self-care and foster emotional distress.

A notable finding was the inverse association between diabetes-related quality of life and the positive illness perception dimensions. Participants with higher personal control, treatment control, and illness coherence reported better quality of life, while those with elevated scores on the negative dimensions—timeline, consequences, cyclical symptoms, and emotional representation—reported poorer quality of life. These findings mirror earlier reports that highlight the role of cognitive and emotional illness representations in determining subjective well-being among individuals with chronic conditions (21). Gender differences were prominent, with male participants reporting significantly higher self-efficacy, illness coherence, personal control, and treatment control, along with better quality of life scores compared to females. Conversely, females reported higher scores on consequences, emotional representation, and all subscales of diabetes-related quality of life, indicating greater perceived disease burden. This is consistent with prior evidence suggesting that women with diabetes often experience greater psychological distress, lower treatment adherence, and reduced coping efficacy compared to men (22,23). The present findings, however, diverge from studies that have shown superior glycemic control in female patients, highlighting the need to consider psychosocial rather than purely clinical measures when assessing disease management outcomes. These findings have several implications for clinical practice. Structured interventions aimed at enhancing self-efficacy and reshaping maladaptive illness perceptions may improve not only self-care adherence but also patients' quality of life. Psychosocial assessments should be integrated into routine diabetes care, allowing for early identification of patients with low self-efficacy or negative illness beliefs. Gender-specific educational and psychological support programs could address the unique challenges faced by women with diabetes, potentially reducing emotional burden and improving self-management.

The strengths of this study include the use of validated psychometric tools with high internal consistency and the examination of multiple psychological constructs within a diverse patient sample. However, certain limitations should be acknowledged. The cross-sectional design precludes causal inferences between illness perceptions, self-efficacy, and quality of life. The use of non-probability sampling limits generalizability, and the reliance on self-reported measures may have introduced response bias. Furthermore, despite the study's objective to assess the impact of demographic variables such as education, treatment modality, and urban–rural residence, detailed subgroup analyses for these factors were not conducted, representing an area for future exploration. Future research should consider longitudinal designs to examine how changes in illness perceptions and self-efficacy over time influence clinical and quality of life outcomes. Additionally, interventional studies targeting these psychological constructs could help establish their causal role in diabetes management. Expanding the analysis to include other psychosocial factors, such as social support and health literacy, may provide a more comprehensive understanding of patient experiences and needs. By addressing these aspects, healthcare providers can deliver more personalized, effective, and holistic diabetes care.

CONCLUSION

This study concluded that illness perception and self-efficacy play pivotal roles in shaping the quality of life of individuals living with diabetes. Findings emphasized that fostering positive beliefs about the manageability of the condition and strengthening patients' confidence in their self-management abilities can lead to meaningful improvements in well-being. By highlighting the interconnectedness of psychological factors and quality of life, the research underscores the need for holistic, patient-centered approaches in diabetes care. Although the study was conducted within the Khyber Pakhtunkhwa province, its implications extend nationally, encouraging further research across different regions to capture broader cultural and contextual influences. The evidence presented reinforces the value of integrating psychosocial interventions alongside medical treatment to achieve more sustainable outcomes for people with diabetes.

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AUTHOR CONTRIBUTION

Author	Contribution
Maryam Bibi	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Farzana Gul	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Shujaat Faqeer	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Imran Ullah	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Shakoor Wisal	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Ali	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Zainab	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Ayesha Bibi*	Writing - Review & Editing, Assistance with Data Curation

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