



Emotional Intelligence, Empathy, and Quality of Life in Patients with Type 1 Diabetes

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ABSTRACT

Diabetes mellitus is a chronic medical condition that imposes continuous emotional, cognitive, and behavioral self-management demands on patients. The present study examined the relationships among emotional intelligence, empathy, and diabetes-specific quality of life in adults with Type 1 diabetes, and evaluated gender differences across these variables. A cross-sectional correlational research design with non-probability purposive sampling was used to recruit N=100 patients with Type 1 diabetes (35 men, 65 women) aged 25–40 years from medical centers in Lahore, Pakistan. Participants completed a demographic profile form, the Brief Emotional Intelligence Scale (BEIS-10), the Toronto Empathy Questionnaire (TEQ), and the Diabetes-Specific Quality of Life Scale (DSQOLS). Internal consistency reliability ranged from acceptable to excellent ($\alpha = .74-.95$). Pearson correlation analyses indicated that empathy had a strong positive relationship with quality of life ($r = .70, p < .001$), whereas emotional intelligence was strongly and negatively correlated with quality of life ($r = -.70, p < .001$) and moderately negatively correlated with empathy ($r = -.52, p < .001$). Two-step hierarchical regression showed that emotional intelligence accounted for 49% of the variance in quality of life ($\beta = -.70, p < .001$). Adding empathy in Step 2 significantly increased explained variance by 14% ($\Delta R^2 = .14, p < .001$), with the full model explaining 63% of total variance. Empathy emerged as a positive predictor ($\beta = .44, p < .001$), whereas emotional intelligence remained a negative predictor ($\beta = -.47, p < .001$) of quality of life. An independent samples t-test revealed no statistically significant gender differences in quality of life, emotional intelligence, or empathy ($p > .30$). These findings highlight the critical role of interpersonal empathy in enhancing quality of life among Type 1 diabetes patients and suggest that high self-reported emotional hyper-awareness without adaptive coping may exacerbate illness perception burden.

Introduction

The American Diabetes Association (ADA, 2014) describes diabetes as a complex, chronic medical condition that requires continuous self-management by the patient. Although diabetes has a strong physical basis, it is also closely associated with psychological and psychosocial difficulties. Diabetes management creates an ongoing emotional burden, and people with diabetes commonly experience distress related to the demands of living with and managing the condition (Ngan et al., 2021; Wicaksana et al., 2024). Despite the increasing prevalence of diabetes, the diagnosis remains a source of shock and distress for patients and their family members.

The ADA (2023) further highlights that both Type 1 and Type 2 diabetes are lifelong conditions that require ongoing management and significant changes in daily routines and health behaviours. According to the World Health Organization (WHO, 2023), despite considerable advances in medical treatment and technology, patients must still regularly monitor their blood glucose levels, medication, diet, and other aspects of their health. These daily demands influence an individual's emotional well-being and overall quality of life. Research has shown that diabetes self-management is associated with psychological outcomes such as distress, anxiety, depression, and quality of life (Kim et al., 2021), and systematic reviews have emphasized the importance of addressing emotional well-being alongside the physical aspects of diabetes care (Ngan et al., 2021; Wicaksana et al., 2024).

Emotional intelligence refers to the ability to recognize and understand one's own emotions, regulate emotional responses, motivate oneself, and recognize and respond appropriately to the emotions of others (Goleman, 1995). Emotional intelligence can also be understood through intrapersonal domains, including self-awareness and self-management, and interpersonal domains, including empathy and relationship competencies (Morrison, 2007). Self-awareness involves understanding one's own emotional experiences, whereas self-management involves the ability to regulate one's thoughts, emotions, and behaviors. Although empathy may be considered an interpersonal component of emotional intelligence, the present study examines emotional intelligence and empathy as separate variables in order to explore their individual relationships with quality of life among patients with diabetes.

In the context of diabetes, emotional intelligence is particularly relevant because patients regularly encounter situations that require emotional regulation and adaptive coping. The ability to understand and manage emotions may help patients deal with the challenges of disease management, maintain motivation for self-care, and respond more effectively to illness-related difficulties. A systematic review of emotional intelligence and diabetes management found that higher emotional intelligence was associated with better psychological outcomes, including lower diabetes-related anxiety and distress, and with better quality of life and well-being (Pérez-Fernández et al., 2021). Similarly, Moradi et al. (2021) reported that emotional intelligence was associated with quality of life among elderly patients with diabetes. These findings suggest that emotional intelligence is an important psychological factor in diabetes management.

Empathy is another interpersonal ability relevant to the psychological experiences of patients with diabetes. Empathy refers to the ability to understand another person's emotions, experiences, and perspectives and to respond appropriately to them (Nembhard et al., 2023). In chronic illness, empathy facilitates supportive interpersonal relationships and effective

communication between patients and healthcare professionals (Jones et al., 2016; Nembhard et al., 2023). Research with people with diabetes has emphasised the importance of empathic communication and emotional support in helping patients feel understood, supported, and empowered in managing their condition (Litterbach et al., 2024). Furthermore, a randomised clinical trial found that empathy-oriented telephone engagement was associated with improved glycaemic control among patients with uncontrolled diabetes (Kahlon et al., 2024).

Quality of life is a central outcome of living with diabetes. Long-term management can affect physical health, emotional well-being, social relationships, daily activities, and overall life satisfaction. Continuous blood glucose monitoring, medication, dietary restriction, and the management of potential complications place a considerable burden on patients. Evidence from systematic reviews suggests that psychological and self-management interventions can improve quality of life among people with diabetes (Wicaksana et al., 2024; Winkley et al., 2020).

The existing literature therefore suggests that emotional and interpersonal abilities play an important role in how individuals respond to chronic health conditions (Pérez-Fernández et al., 2021). Individuals who are better able to understand and regulate their emotions may be better equipped to manage illness-related challenges, while empathic abilities facilitate positive interpersonal relationships and social support (Peimani et al., 2020; Saeed et al., 2024). However, although previous studies have examined emotional intelligence in relation to diabetes management and quality of life, and others have explored the role of empathy in diabetes care, few studies have examined emotional intelligence, empathy, and quality of life together, particularly among adults with Type 1 diabetes in Pakistan.

The present study therefore examined emotional intelligence, empathy, and quality of life among patients with Type 1 diabetes. Examining these variables together clarifies whether emotional intelligence and empathy are independently associated with quality of life and provides information for developing psychological and supportive approaches aimed at improving patients' overall well-being.

Objectives

1. To examine the relationship between emotional intelligence, empathy and Quality of Life among patients with diabetes.
2. To find out the Predictive role of Emotional Intelligence and Empathy on Quality of Life among patients with Type 1 diabetes.
3. To evaluate gender differences in quality of life, emotional intelligence, and empathy among patients with Type 1 diabetes.

Hypotheses

H1: There are significant relationship between emotional intelligence, empathy and Quality of Life among patients with Type 1 diabetes.

H2: Emotional intelligence and Empathy significantly predict Quality of Life among patients with Type 1 diabetes.

H3: There is a significant difference between gender on Emotional intelligence, empathy and Quality of life among Type 1 diabetes patients.

Methods

Participants

A non-probability purposive sampling technique was used. The sample comprised $N = 100$ patients with Type 1 diabetes mellitus ($n = 35$ men, $n = 65$ women) aged 25 to 40 years, recruited from hospitals and diabetes clinics in Faisalabad. Inclusion criteria were a confirmed diagnosis of Type 1 diabetes mellitus and an age of 25 to 40 years. Patients diagnosed with Type 2 diabetes mellitus and those younger than 25 years were excluded.

Measures

Brief Emotional Intelligence Scale (BEIS-10). Emotional intelligence was assessed with the BEIS-10, a 10-item self-report measure developed by Davies et al. (2010) on the basis of the emotional intelligence framework proposed by Salovey and Mayer (1990). The scale assesses five dimensions: appraisal of own emotions, appraisal of others' emotions, regulation of own emotions, regulation of others' emotions, and utilisation of emotions. Items are rated on a 5-point scale, and higher scores indicate higher emotional intelligence (Davies et al., 2010).

Toronto Empathy Questionnaire (TEQ). Empathy was assessed with the TEQ, a 16-item self-report measure developed by Spreng et al. (2009) that assesses emotional sensitivity, emotional understanding, sympathetic arousal, and prosocial helping behaviour. Items are rated on a 5-point scale (0 = never to 4 = always); eight items are reverse scored, and higher total scores indicate greater empathy (Spreng et al., 2009).

Diabetes-Specific Quality of Life Scale (DSQOLS). Diabetes-related quality of life was assessed with the DSQOLS (Bott et al., 1998), which evaluates aspects of quality of life associated with diabetes management, including treatment satisfaction, treatment-related burden, dietary restrictions, and the personal importance of treatment goals. Responses are given on Likert-type scales. The DSQOLS has demonstrated reliability and validity for assessing the impact of Type 1 diabetes management on patients' daily lives (Bott et al., 1998).

Procedure

An authority letter was obtained from the University to initiate the research. The letter authenticated the researcher's identity and research topic and was presented to the institutions from which data were collected. Inclusion and exclusion criteria were established beforehand, and eligible patients were approached through purposive sampling. The purpose and nature of the study were explained to participants, and written informed consent was obtained before data collection. Participants were assured that participation was voluntary, that their information would remain confidential and be used only for research purposes, and that they could withdraw at any stage without negative consequences. After consent, participants completed the demographic information form, followed by the BEIS-10, TEQ, and DSQOLS. Standardised instructions were provided, participants were given sufficient time to complete all items, and the researcher remained available to clarify instructions without influencing responses. Completed questionnaires were checked for completeness, codes were used instead of names, and the data were entered into SPSS for analysis.

Results

The results are presented Pearson correlations among the study variables and demographic variables, followed by a Hierarchical regression analysis examining emotional intelligence and empathy as predictors of quality of life. Independent samples *t*-test analysis across gender.

Table 1 Descriptive Statistics and Reliability Coefficients of the Study Scales

Variable	<i>M</i>	<i>SD</i>	Range	α
Emotional intelligence	31.92	9.68	10-50	.95
Empathy	43.00	5.59	16-64	.74
Quality of life	20.62	8.89	26-130	.87

Note. *N* = 100.

As detailed in Table 1, Cronbach's alpha reliability coefficients demonstrated excellent internal consistency for the Brief Emotional Intelligence Scale ($\alpha = .95$), good internal consistency for the Diabetes-Specific Quality of Life Scale ($\alpha = .87$), and acceptable internal consistency for the Toronto Empathy Questionnaire ($\alpha = .74$). Participants exhibited moderate baseline levels of emotional intelligence ($M = 31.92$, $SD = 9.68$) and high levels of empathy ($M = 43.00$, $SD = 5.59$), alongside substantial individual variation in quality of life scores ($M = 20.62$, $SD = 8.89$).

Table 2: Pearson Product-Moment Correlations Among the Study Variables

Variable	1	2	3
1. Quality of life	—		
2. Emotional intelligence	-.70**	—	
3. Empathy	.70**	-.52**	—

Note. *N* = 100. ** $p < .01$.

Table 2 revealed that Empathy was strongly and positively correlated with quality of life, $r(98) = .70$, $p < .001$. Conversely, emotional intelligence was strongly and negatively correlated with quality of life, $r(98) = -.70$, $p < .001$, and moderately negatively correlated with empathy, $r(98) = -.52$, $p < .001$.

Table 3 Pearson Correlations Between Demographic Variables and the Study Variables

Demographic variable	Quality of life	Emotional intelligence	Empathy
Gender	.10	-.10	.09
Education	-.07	.14	-.03
Living area	-.12	.13	-.04
Medical condition	.21*	-.24*	-.18
Family relationship	.10	.09	-.10
Psychiatric issues	-.21*	-.24*	-.18
Family structure	.17	-.22*	.13

Note. *N* = 100. * $p < .05$.

As presented in Table 3, medical condition showed a weak positive correlation with quality of life ($r = .21$, $p = .036$) and a negative correlation with emotional intelligence ($r = -.24$, $p = .016$).

Self-reported psychiatric issues correlated negatively with both quality of life ($r = -.21, p = .036$) and emotional intelligence ($r = -.24, p = .016$). Family structure was negatively associated with emotional intelligence ($r = -.22, p = .028$). Gender, education, living area, and family relationships showed no significant associations with any main study variable.

Table 4 Hierarchical Regression Analysis Predicting Quality of Life From Emotional Intelligence and Empathy

Variable	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
Step 1							
Emotional intelligence	-0.64***	-0.75	-0.54	0.05	-.70***	.49	.49***
Step 2							
Emotional intelligence	-0.43***	-0.53	-0.32	0.05	-.47***	.63	.14***
Empathy	0.70***	0.51	0.88	0.09	.44***		

Note. $N = 100$. *B* = unstandardized regression coefficient; *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of *B*; β = standardized regression coefficient; ΔR^2 = change in R^2 . *** $p < .001$.

In Step 1 of the hierarchical regression, emotional intelligence accounted for 49% of the variance in quality of life, $R^2 = .49$, $F(1, 98) = 94.16$, $p < .001$, serving as a significant negative predictor ($\beta = -.70$, $p < .001$). In Step 2, adding empathy contributed an additional 14% of unique variance, $\Delta R^2 = .14$, $\Delta F(1, 97) = 36.70$, $p < .001$. The overall model was highly significant, $R^2 = .63$, $F(2, 97) = 82.58$, $p < .001$, explaining 63% of the variance in quality of life. In the final model, empathy was a strong positive predictor ($\beta = .44$, $p < .001$), whereas emotional intelligence remained a significant negative predictor ($\beta = -.47$, $p < .001$). Thus, Hypothesis 2 was fully supported.

Table 5 Comparison of Quality of Life, Emotional Intelligence, and Empathy Between Male and Female Patients with Type 1 Diabetes

Variable	Male <i>M (SD)</i>	Female <i>M (SD)</i>	<i>T</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Quality of life	19.50 (8.20)	21.22 (9.23)	-0.92	98	.360	-0.19
Emotional intelligence	33.10 (9.80)	31.28 (9.62)	0.89	98	.376	0.19
Empathy	42.40 (5.80)	43.32 (5.50)	-0.78	98	.437	-0.16

Note. $N = 100$ (35 Men, 65 Women).

An independent-samples *t*-test was conducted to determine whether scores on quality of life, emotional intelligence, and empathy differed significantly by gender among adults with Type 1 diabetes. For *Quality of life*, female patients ($M = 21.22$, $SD = 9.23$) scored slightly higher than male patients ($M = 19.50$, $SD = 8.20$), but this difference was not statistically significant, $t(98) = -0.92$, $p = .360$, Cohen's $d = -0.19$, 95% CI [-0.61, 0.22]. For *Emotional intelligence*, male patients ($M = 33.10$, $SD = 9.80$) reported slightly higher mean scores than female patients ($M =$

31.28, $SD = 9.62$); however, the difference was not statistically significant, $t(98) = 0.89$, $p = .376$, Cohen's $d = 0.19$, 95% CI $[-0.23, 0.60]$. For *Empathy*, female patients ($M = 43.32$, $SD = 5.50$) scored marginally higher than male patients ($M = 42.40$, $SD = 5.80$), but the difference was non-significant, $t(98) = -0.78$, $p = .437$, Cohen's $d = -0.16$, 95% CI $[-0.58, 0.25]$. Consequently, Hypothesis 3 was not supported, indicating that psychological functioning and quality of life in this sample are equivalent across gender groups.

Discussion

The present study examined the relationships among emotional intelligence, empathy, and diabetes-specific quality of life in adults with Type 1 diabetes, tested whether emotional intelligence and empathy predict quality of life, and evaluated gender differences across these variables. Three main findings emerged. First, empathy was strongly and positively associated with quality of life, whereas self-reported emotional intelligence was strongly and negatively associated with quality of life and moderately and negatively associated with empathy. Second, emotional intelligence and empathy together explained 63% of the variance in quality of life, with each variable making a significant and independent contribution in opposite directions. Third, no significant gender differences were found on any study variable. Taken together, these findings indicate that affective and interpersonal processes are closely linked to how adults with Type 1 diabetes experience the burden of their condition (Ngan et al., 2021; Wicaksana et al., 2024).

The first hypothesis, which predicted significant relationships among emotional intelligence, empathy, and quality of life, was supported, although not all associations were in the direction suggested by previous literature. Empathy showed a strong positive correlation with quality of life ($r = .70$, $p < .001$). This finding is consistent with research showing that empathic communication and emotional support help people with diabetes feel understood and supported in managing their condition (Litterbach et al., 2024), and with trial evidence that empathy-oriented engagement is associated with improved glycemic control (Kahlon et al., 2024). Patients with greater empathic ability may be better able to build and use supportive relationships with family members and healthcare providers, which may in turn buffer the daily stress of insulin therapy, glucose monitoring, and dietary restriction (Jones et al., 2016; Nembhard et al., 2023; Peimani et al., 2020).

In contrast, emotional intelligence was strongly and negatively correlated with quality of life ($r = -.70$, $p < .001$). This result runs counter to studies reporting positive associations between emotional intelligence and quality of life or well-being among patients with diabetes (Moradi et al., 2021; Pérez-Fernández et al., 2021; Yalcin et al., 2008) and among students (Alibabaie, 2015; Anjum & Swathi, 2017). One possible explanation concerns what self-report emotional intelligence measures capture in a clinical population. Research using the Trait Meta-Mood Scale has shown that attention to emotions, when not accompanied by emotional clarity and repair, is associated with poorer rather than better well-being (Extremiera & Fernández-Berrocal, 2005). For adults with Type 1 diabetes, high attention to and appraisal of one's own emotions may translate into heightened awareness of illness-related concerns such as fear of hypoglycemia, feelings of powerlessness, and management demands, which are recognized as major sources of diabetes distress in this population (Fisher et al., 2015). Without adaptive regulation strategies (Gross, 1998), such awareness may intensify the perceived burden of treatment and lower

diabetes-specific quality of life. Because the BEIS-10 was analyzed as a total score, the present data cannot determine which dimensions of emotional intelligence drive this association.

Emotional intelligence was also moderately and negatively correlated with empathy ($r = -.52, p < .001$). This finding differs from studies of nursing and medical students in which the two constructs were positively related (Hajibabae et al., 2018; Silva & Toledo Júnior, 2021), and from research with adolescents showing that both contribute positively to life satisfaction (Guasp Coll et al., 2020). A plausible interpretation is that, in patients managing a demanding chronic condition, emotional resources directed toward monitoring and regulating one's own emotional state may compete with outward, other-oriented empathic engagement. This interpretation remains tentative and requires replication. In addition, the small but significant associations of medical condition, psychiatric issues, and family structure with the study variables (Table 3) suggest that clinical and family context should be controlled for in future analyses.

The second hypothesis, that emotional intelligence and empathy would significantly predict quality of life, was supported. Emotional intelligence alone explained 49% of the variance in quality of life, and empathy explained an additional 14% beyond emotional intelligence ($\Delta R^2 = .14, p < .001$), so that the final model accounted for 63% of the variance. In the final model, empathy remained a positive predictor ($\beta = .44, p < .001$) and emotional intelligence a negative predictor ($\beta = -.47, p < .001$). The incremental contribution of empathy indicates that, in this sample, empathy functions as a resource distinct from overall emotional intelligence, which supports the decision to examine the two constructs separately (Morrison, 2007). The opposing directions of the two predictors suggest that interpersonal, other-oriented emotional capacities may protect quality of life, whereas self-focused emotional monitoring may become burdensome unless it is accompanied by effective coping. This pattern is consistent with evidence that psychological and self-management interventions improve outcomes in diabetes (Wicaksana et al., 2024; Winkley et al., 2020). However, the proportion of explained variance is large for psychosocial predictors and should be interpreted with caution, because all variables were measured by self-report at a single time point (Podsakoff et al., 2003).

The third hypothesis, which predicted gender differences, was not supported. Male and female patients did not differ significantly in quality of life, $t(98) = -0.92, p = .360, d = -0.19$, emotional intelligence, $t(98) = 0.89, p = .376, d = 0.19$, or empathy, $t(98) = -0.78, p = .437, d = -0.16$, and all effect sizes were small. Gender also showed no significant correlation with any study variable (Table 3). These results suggest that, within this sample, the psychological factors associated with quality of life operate similarly for men and women, and that psychosocial interventions may be applicable across genders. Nevertheless, with only 35 men in the sample, the study had limited power to detect small differences, and the absence of significant differences should not be interpreted as evidence of equivalence.

Limitations and Suggestions for Future Research

Several limitations should be considered when interpreting these findings. First, the sample was small ($N = 100$), recruited through non-probability purposive sampling from a single city, and restricted to adults aged 25 to 40 years with Type 1 diabetes. This limits generalizability to other regions of Pakistan, to older adults and adolescents, and to people with Type 2 diabetes. The gender distribution was also unequal (35 men, 65 women), which reduced statistical power for

gender comparisons. Second, the cross-sectional correlational design does not permit causal conclusions; for example, poorer quality of life may increase attention to one's emotions rather than the reverse. Third, all variables were assessed through self-report at one time point, so shared method variance and social desirability may have inflated the observed associations (Podsakoff et al., 2003). Fourth, the BEIS-10 was analyzed only as a total score, which prevented examination of whether specific dimensions, such as appraisal of one's own emotions versus regulation of emotions, account for its negative association with quality of life. Its very high internal consistency ($\alpha = .95$) for a brief, multidimensional scale may also indicate item redundancy or a uniform response style. Fifth, the scoring direction of the DSQOLS total score should be reported explicitly, because the interpretation of the negative coefficient depends on whether higher scores reflect better quality of life or greater treatment burden. Finally, clinical indicators such as HbA1c, illness duration, treatment modality, and complications were not measured, and the cultural and linguistic adaptation of the instruments for Pakistani patients was not examined.

Future research should use multi-center longitudinal designs with larger and gender-balanced samples, and should include clinical markers such as HbA1c and illness duration. Analyses at the level of emotional intelligence subscales are needed to identify which emotional processes are adaptive or burdensome in Type 1 diabetes. Researchers should also test mediating and moderating mechanisms, including diabetes distress, coping strategies, illness perceptions, and social support (Fisher et al., 2015; Peimani et al., 2020). Intervention studies could evaluate whether empathy-focused support and structured emotion-regulation programs improve quality of life in this population (Ngan et al., 2021; Yalcin et al., 2008), and qualitative or mixed-methods studies could clarify how patients themselves experience emotional awareness in daily diabetes management.

Implications

These findings have practical implications for diabetes care in Pakistan. Because empathy was the strongest positive predictor of quality of life, diabetes clinics may benefit from peer support groups, family-inclusive diabetes education, and empathy-focused communication training for healthcare personnel (Litterbach et al., 2024; Nembhard et al., 2023). Clinicians should also recognize that patients who report high emotional awareness may experience greater illness-related distress. Such patients may benefit from emotion-regulation, mindfulness-based, and acceptance-based approaches, including acceptance and commitment therapy, that help convert emotional monitoring into constructive self-management (Hayes et al., 2006; Ngan et al., 2021). Routine screening for diabetes distress alongside medical review could further help identify patients who need psychological support (Fisher et al., 2015).

Conclusion

This study showed that emotional intelligence and empathy together explained 63% of the variance in diabetes-specific quality of life among adults with Type 1 diabetes in Pakistan. Empathy was a strong positive predictor of quality of life, whereas self-reported emotional intelligence was an unexpected negative predictor and was inversely related to empathy. No significant gender differences were found in emotional intelligence, empathy, or quality of life. These findings suggest that interpersonal emotional capacities may support quality of life, while self-focused emotional awareness may add to illness burden when it is not paired with adaptive

regulation. Given the cross-sectional, self-report design, these conclusions are provisional. Diabetes care may nonetheless benefit from integrating empathy-oriented support and structured emotion-regulation strategies into routine management, and future longitudinal research should clarify the mechanisms underlying the negative association between emotional intelligence and quality of life.

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