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EMPOWERING LIVES THROUGH EDUCATION: IMPROVING QUALITY OF LIFE FOR PEOPLE WITH TYPE 1 DIABETES IN PUNJAB

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Abstract

Objective: *This study aimed to evaluate the quality of life and identify factors influencing it among individuals with type 1 diabetes in Punjab. Additionally, it sought to gather their perspectives on the establishment of a national structured education program to empower people living with type 1 diabetes.*

Methods: *A cross-sectional, questionnaire-based study was conducted. The findings revealed potential for improvement across all domains of health-related quality of life.*

Results: *No statistically significant differences were observed across demographic and clinical subgroups of participants. Notably, 94.9% of respondents expressed support for the introduction of a structured education program for type 1 diabetes in Pakistan.*

Conclusions: *There is a critical need for a comprehensive strategy to enhance awareness and understanding of type 1 diabetes in Pakistan.*

INTRODUCTION

Type 1 diabetes (T1D) presents a significant public health challenge in Pakistan, where healthcare infrastructure, particularly in rural settings, is often insufficient to meet the needs of those requiring lifelong insulin therapy. In Sindh province, establishing structured model clinics that offered standardized care—including education, free insulin, glucometers, and dietary counseling—led to notable improvements in glycaemic control over three years, underscoring the transformative potential of comprehensive care approaches in resource-limited environments (Ahmedani et al., 2019).

Health literacy (HL) plays a pivotal role in diabetes self-management and quality of life. A recent scoping review highlighted that adequate HL is associated with better self-care, glycaemic control, and overall quality of life in individuals with T1D; however, deficiencies in numeracy, self-efficacy, and socioeconomic barriers continue to impede effective disease management (Milani, 2025). Similarly, a Turkish study demonstrated that higher HL and educational attainment correlated with improved quality of life and fewer complications among adults living with T1D (Esen et al., 2020).

These findings suggest that structured, context-specific educational interventions could significantly enhance outcomes for people with T1D in Punjab. Web-based educational programs in Turkey, for instance, improved self-efficacy and quality of life among adolescents with T1D, even without affecting A1C levels (Ayar et al., 2021). Given Punjab's large population and distinct socio-cultural dynamics,

developing an accessible, culturally tailored diabetes education program—whether through clinics, digital platforms, or schools—could empower individuals, strengthen self-management, and ultimately elevate quality of life across the province.

1. Materials and Methods

This cross-sectional study utilized the Life with Type 1 Diabetes (Vida con Diabetes Tipo 1, ViDa1) questionnaire (11). The ViDa1 was selected because type 1 diabetes exerts a greater impact on an individual's life compared to type 2 diabetes, and previously used questionnaires have shown limitations over time (12–13). The ViDa1 consists of 34 items grouped into four dimensions that shape health-related quality of life: interference with life, self-care, well-being, and concerns about the medical condition. An additional question was included, phrased as: "Do you feel a structured education program for type 1 diabetes in Punjab will empower you to live a better life with type 1 diabetes?" The response options were "Yes" or "No."

The questionnaire was hosted on Google Forms, and the link was shared through Meethi Zindagi's official Facebook page and closed groups dedicated to the type 1 diabetes community (facebook.com/meethizindagidiabetes). Meethi Zindagi is a registered non-profit organization working for the cause of diabetes in Pakistan (www.meethizindagi.org). The Facebook group serves as a dedicated platform for individuals living with type 1 diabetes. Data collection remained open for two months, and participation was anonymous. Parents of young children with type 1 diabetes completed the questionnaire on their behalf.

Responses were recorded on a five-point Likert scale, with scores summed to produce a total score for each participant. The questionnaire has no validated cut-off points. Statistical analysis was performed using SPSS version 23. Descriptive statistics, including mean and standard deviation, were calculated, and a p-value of < 0.05 was considered statistically significant.

2. Results

Table 1. Demographic and Clinical Profile of Participants

Variable	Category	Number (%)
Age	Up to 20 years	51 (37.0%)
	21–30 years	53 (38.4%)
	Above 30 years	34 (24.6%)
Gender	Male	52 (38.0%)
	Female	84 (62.0%)
Education	Primary	14 (10.0%)
	Secondary	28 (20.0%)
	University	96 (70.0%)
Years since diagnosis of diabetes	Up to 5 years	50 (36.2%)
	6–10 years	31 (22.4%)
	11–15 years	25 (18.1%)
	More than 15 years	32 (23.1%)
Most recent HbA1c	Mean ± SD	7.97 ± 2.07%

The study included 138 participants, predominantly female (62%), with the largest age groups being those aged 21–30 years (38.4%) and up to 20 years (37.0%). Most participants (70%) were enrolled in university, while 10% had primary-level education and 20% had secondary education. Regarding clinical characteristics, over one-third (36.2%) had been living with type 1 diabetes for up to five years, and nearly one-quarter (23.1%) had more than 15 years since diagnosis. The mean most recent HbA1c level was 7.97 ± 2.07%, indicating variable glycaemic control among participants.

Table 2. Mean Scores of Health-Related Quality of Life Dimensions by Demographic and Clinical Characteristics

Variable	Interference with Life Mean ± SD	Self-Care Mean ± SD	Well-Being Mean ± SD	Concern About Illness Mean ± SD	Full Scale Mean ± SD	P value (Full Scale)
Age						
< 20 years	3.00 ± 0.73	3.51 ± 0.71	3.35 ± 0.76	3.93 ± 0.87	3.37 ± 0.51	0.127
21–30 years	3.20 ± 0.83	3.75 ± 0.71	3.32 ± 0.71	4.01 ± 0.74	3.51 ± 0.46	
Above 30 years	3.17 ± 0.80	3.68 ± 0.83	3.30 ± 0.81	4.02 ± 0.62	3.49 ± 0.45	
P value	0.428	0.164	0.893	0.912		
Sex						
Male	3.26 ± 0.84	3.75 ± 0.72	3.41 ± 0.75	3.20 ± 0.74	3.56 ± 0.43	0.05
Female	3.01 ± 0.73	3.56 ± 0.76	3.26 ± 0.74	3.96 ± 0.78	3.37 ± 0.49	
P value	0.05	0.11	0.28	0.93		
Education						
Primary	3.00 ± 0.93	3.50 ± 0.98	3.45 ± 0.93	3.86 ± 1.10	3.37 ± 0.81	0.31
Secondary	3.16 ± 0.75	3.54 ± 0.68	3.31 ± 0.75	3.83 ± 0.86	3.41 ± 0.47	
University	3.12 ± 0.78	3.69 ± 0.73	3.31 ± 0.73	4.04 ± 0.67	3.48 ± 0.42	
P value	0.93	0.44	0.62	0.51		
Years Since Diagnosis						
< 5 years	3.16 ± 0.75	3.53 ± 0.79	3.26 ± 0.76	3.84 ± 0.93	3.40 ± 0.50	0.53
6–10 years	2.85 ± 0.76	3.92 ± 0.57	3.49 ± 0.61	3.88 ± 0.66	3.46 ± 0.40	
11–15 years	3.14 ± 0.85	3.73 ± 0.65	3.55 ± 0.66	4.11 ± 0.68	3.55 ± 0.38	
> 15 years	3.29 ± 0.77	3.49 ± 0.83	3.11 ± 0.86	4.14 ± 0.58	3.45 ± 0.58	
P value	0.10	0.09	0.09	0.41		

Table 2 presents the mean scores and standard deviations for four health-related quality of life (HRQoL) dimensions—interference with life, self-care, well-being, and concern about illness—along with the overall full-scale scores, stratified by age, sex, education level, and years since diagnosis of type 1 diabetes.

Across all age groups, scores were relatively similar, with "concern about illness" consistently receiving the highest mean values (ranging from 3.93 to 4.02), indicating that worries related to the condition were prevalent regardless of age. No statistically significant differences were observed between age groups for any HRQoL dimension ($p > 0.05$).

When comparing by sex, males reported slightly higher mean scores for interference with life, self-care, well-being, and the full-scale score, whereas females reported higher scores for concern about illness (3.96 vs. 3.20). The difference in full-scale scores between males and females approached statistical significance ($p = 0.05$).

By education level, the highest full-scale mean score was observed among university-educated participants (3.48 ± 0.42), followed by those with secondary education (3.41 ± 0.47) and primary education (3.37 ± 0.81). However, differences were not statistically significant ($p > 0.05$).

For years since diagnosis, those living with type 1 diabetes for 11–15 years had the highest full-scale mean score (3.55 ± 0.38), while participants with a diagnosis duration of less than 5 years had the lowest (3.40 ± 0.50). Despite these variations, no statistically significant differences were found across groups ($p > 0.05$). Overall, the results indicate that quality-of-life concerns are common across all demographic and clinical categories, highlighting the need for broad-based interventions to support individuals with type 1 diabetes.

3. Discussions

The present study highlights a consistent need for improvement in all domains of health-related quality of life (HRQoL) among individuals living with type 1 diabetes (T1D) in Pakistan. The absence of statistically significant differences across demographic and clinical subgroups suggests that the challenges associated with T1D management and its psychosocial impact are pervasive, transcending age, gender, education level, and duration of disease. This aligns with the findings of Haugstvedt et al. (2019), who reported that HRQoL impairments in T1D are influenced more by self-management demands and emotional burden than by demographic characteristics.

The particularly high scores in the "concern about illness" domain indicate persistent anxiety and disease-related worry among participants. Previous research has demonstrated that such concerns are often linked to inadequate access to structured diabetes education and psychosocial support services (Peyrot et al., 2014). In low- and middle-income countries, including Pakistan, the lack of culturally tailored educational programs exacerbates these concerns, as individuals may lack the skills, confidence, and resources to manage their condition effectively (Shaw et al., 2021). The overwhelming support (94.9%) expressed by participants for a structured education program underscores the potential of such interventions to address these unmet needs.

Global evidence suggests that structured diabetes education can significantly improve self-care behaviors, glycaemic control, and HRQoL in T1D (Powers et al., 2020). For example, a randomized controlled trial in the UK demonstrated that participation in the Dose Adjustment for Normal Eating (DAFNE) program improved both metabolic outcomes and psychological well-being among adults with T1D (Speight et al., 2010). Similarly, a recent study in India found that community-based diabetes education tailored to local cultural and literacy contexts enhanced self-efficacy and reduced diabetes distress (Kalra et al., 2021). Applying these insights to Punjab's sociocultural context could yield substantial benefits, particularly if interventions integrate peer support, digital health tools, and family involvement to reinforce self-management behaviors.

4. Conclusion

This study demonstrates that individuals with type 1 diabetes in Pakistan experience notable challenges across all domains of health-related quality of life, regardless of demographic or clinical characteristics. The strong support for a structured education program highlights an urgent need for culturally tailored, accessible interventions to enhance self-management skills, reduce disease-related concerns, and ultimately improve quality of life.

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