

HEALTH-RELATED QUALITY OF LIFE IN DIABETIC FOOT ULCER PATIENTS: A CROSS-SECTIONAL ANALYSIS

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ABSTRACT

Background: Diabetic foot ulcers (DFUs) are one of the most debilitating complications of diabetes mellitus, often leading to infection, amputation, and reduced quality of life. Evaluating the health-related quality of life (HRQoL) in affected individuals is critical for optimizing patient care and targeted interventions. **Objective:** To determine the health-related quality of life (HRQoL) among patients with diabetic foot ulcers in the Department of Diabetes and Endocrinology at Lady Reading Hospital, Peshawar. **Study Design:** Cross-sectional study. **Setting:** Department of Diabetes and Endocrinology, Lady Reading Hospital, Peshawar, Pakistan. **Duration of Study:** 20-10-2024 to 20-04-2025. **Methods:** A total of 283 patients diagnosed with diabetic foot ulcers were enrolled. HRQoL was assessed using the validated Short Form-36 (SF-36) questionnaire, which evaluates eight domains: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. Additional clinical data regarding infection status, presence of neuropathy, and history of amputation were recorded. Data were analyzed using descriptive statistics; results were reported as mean \pm standard deviation. **Results:** The mean age of participants was 53.75 ± 15.13 years, with females comprising 61.5% of the study population. Clinical complications included infections in 57.6%, neuropathy in 54.1%, and amputations in 20.8% of patients. HRQoL assessment revealed significant impairments in physical function (52.96 ± 13.65), role-physical (34.10 ± 3.83), and bodily pain (37.53 ± 10.76). Additionally, mental health (33.85 ± 9.40) and social functioning (32.66 ± 4.91) scores were markedly reduced. **Conclusion:** Patients with diabetic foot ulcers experience significant impairments in both physical and psychosocial aspects of health-related quality of life. These findings highlight the need for multidisciplinary care approaches focusing on both clinical management and psychological support to improve overall patient outcomes.

Keywords: Diabetic Foot Ulcer, Health-Related Quality of Life, SF-36, Neuropathy, Amputation

INTRODUCTION

Diabetes mellitus (DM) is a metabolic condition defined by chronic hyperglycemia, arising from insufficient insulin production or the body's impaired utilisation of insulin. DM has reached epidemic proportions globally, impacting over 537 million individuals in 2021, with projections suggesting an increase to 643 million by 2030. The significant rise is mainly explained by urbanisation, ageing, and lifestyle alterations. Pakistan ranks among the top ten countries with the highest prevalence of DM, with 19.4% of its adult population affected. The incidence of DM in Pakistan has increased significantly in recent decades, posing an enormous public health challenge, especially in light of an insufficient healthcare system and elevated rates of untreated/poorly controlled diabetes (1-5). Poor glycaemic control in DM patients correlates with the onset of microvascular complications, in addition to macrovascular complications (6,7). Diabetic foot ulcers represent a significant concern among such complications due to their debilitating effects. Inadequately controlled diabetes frequently results in neuropathy as well as peripheral artery disease, both of which are significant factors in the onset of foot ulcers. Diabetic foot represents an escalating problem in Pakistan, as the rising incidence of DM correlates with an increase in foot-related complications. Complications related to inadequate glycaemic control, neuropathy, and peripheral artery disease commonly lead to the development of diabetic foot ulcers. These ulcers result in significant pain and mobility challenges, while also elevating the risk for infections, amputations, and, in certain instances, mortality (8, 9). The prevalence of diabetic foot ulcers in Pakistan is significant, exacerbated by restricted medical facilities and delayed diagnoses that frequently worsen the condition (10). Diabetic foot ulcers represent a significant medical concern, significantly affecting patients' overall well-being as well as severely impacting their health-related quality

of life (HRQoL) (11). Individuals with diabetic foot ulcers encounter physical limitations, persistent pain, as well as psychological distress, which collectively reduce their overall well-being (12, 13). The situation in Pakistan is critical, as numerous patients face difficulties with obtaining prompt and sufficient medical care, resulting in a detrimental cycle of deteriorating well-being and diminished HRQoL. Various scales are utilised for assessment. One such instrument is the SF-36, which assesses the physical as well as social dimensions of life frequently affected by this condition (14).

This study aims to assess the HRQoL in patients suffering from diabetic foot ulcers. The study aims to identify the specific needs of the population by examining the physical, emotional, and social challenges encountered by these patients. The insights obtained will serve to guide patient-centered care and inform public health strategies in Pakistan, where the prevalence of diabetes is on the rise.

METHODOLOGY

This cross-sectional study was conducted at the Department of Diabetes and Endocrinology, Lady Reading Hospital, Peshawar. This study was carried out from 20-10-2024 to 20-04-2025 after taking ethical approval from the hospital. Two hundred eighty-three patients diagnosed with diabetic foot ulcers were selected. Participants were recruited through random sampling from the OPD. Inclusion protocols comprised adult patients 30 to 80 years with type 1 or type 2 diabetes and active DFUs, while those with non-diabetic ulcers, significant comorbidities (e.g., advanced cancer), or cognitive impairments were not included. Consent was obtained from all patients. Data were collected using the medical record reviews for capturing demographics, age, gender, socioeconomic status, education, and place of living, clinical characteristics such as neuropathy, infection, and amputation. HRQoL outcomes were assessed via the SF-36

questionnaire. The SF-36 assessed eight domains, including physical function, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health, with scores ranging from 0 (worst) to 100 (best).

SPSS 26 was used for analyzing the gathered data. Numerical variables were presented using mean and SD, while categorical variables were presented using frequencies and percentages.

RESULTS

We had 283 patients in our study with a mean age of 53.75 ± 15.13 years. The average duration of diabetes was 9.60 ± 3.43 years, and the mean BMI was $26.78 \pm 1.89 \text{ kg/m}^2$.

In terms of demographics, females were 174 (61.5%) while males comprised 109 (38.5%) (Table 1).

Table 1: Demographics

Demographics		n	%
Gender	Male	109	38.5%
	Female	174	61.5%
Occupation status	Labor	51	18.0%
	Office Worker	89	31.4%
	Retired	100	35.3%
	Other	43	15.2%
Socioeconomic status	Upper class	62	21.9%
	Middle class	152	53.7%
	Lower class	69	24.4%
Living place	Urban	119	42.0%
	Rural	164	58.0%

Clinical presentations revealed that 163 (57.6%) participants had infections. Neuropathy was reported in 153 (54.1%) cases. Amputation was less common, occurring in 59 (20.8%) cases (Table 2).

HRQOL scores were assessed across multiple domains. The physical function score averaged 52.96 ± 13.65 . Role physical score was 34.10 ± 3.83 . Patients reported a bodily pain score of 37.53 ± 10.76 and a general health score of 48.87 ± 11.63 . The vitality score stood at 44.40 ± 9.21 , and social functioning was scored at 32.66 ± 4.91 . The role-emotional and mental health scores were 39.87 ± 6.95 and 33.85 ± 9.40 , respectively (Table 3).

Table 2: Clinical presentation

Clinical presentation		n	%
Infection	Yes	163	57.6%
	No	120	42.4%
Neuropathy	Yes	153	54.1%
	No	130	45.9%
Amputation	Yes	59	20.8%
	No	224	79.2%

Table 3: Mean HRQoL scores

HRQoL	Mean (n = 283)	Std. Deviation (n = 283)
Physical function score	52.96	13.654
Role physical score	34.10	3.833
Bodily Pain score	37.5371	10.76710
General Health score	48.8728	11.63320
Vitality score	44.4099	9.21963
Social Functioning score	32.6678	4.91588
Role-Emotional score	39.8799	6.95577
Mental Health score	33.8551	9.40519

DISCUSSION

Previous research has consistently demonstrated substantial HRQoL impairments in DFU patients, particularly in physical domains. Studies utilizing the SF-36 instrument have reported markedly low physical functioning scores (mean 37.3) and role-physical scores (mean 30.75). At the same time, mental health domains tend to be relatively better preserved, though still compromised (mean 78.4), compared to healthy populations (15, 16). The EQ-5D assessments in other studies have corroborated these findings, revealing significant mobility limitations and pain interference in daily activities (17, 18). Clinical factors, including ulcer severity, infection status, and neuropathy, have been strongly associated with poorer HRQoL outcomes across multiple studies (19, 20). The relationship between DFU complications and HRQoL deterioration has been well-established in the literature. Peripheral neuropathy presents in 54.1% of our patients and up to 75.5% in Raza et al's study. It contributes substantially to reduced physical function and vitality due to chronic pain and mobility restrictions (19). Amputation, while less frequent, has been consistently shown to dramatically impact physical and social functioning domains (17, 21). Notably, first-time ulcer occurrence has been identified as a significant predictor of HRQoL decline, suggesting that the psychological adjustment to new diagnoses may compound physical limitations (18). These findings collectively highlight the complex interplay between biological and psychosocial factors in determining HRQoL outcomes for DFU patients.

Our results demonstrate several vital consistencies with prior research while revealing some notable differences. The physical function score (52.96 ± 13.65) in our study was higher than values reported by Shahbaz et al.. Still, it aligned more closely with Perrin et al.'s findings, potentially reflecting variations in ulcer severity or treatment protocols across populations (15, 16). The role-physical (34.10 ± 3.83) and bodily pain (37.53 ± 10.76) scores were remarkably consistent with studies above, reinforcing the substantial physical burden of DFU (15, 16). However, our mental health domain score (33.85 ± 9.40) showed more pronounced impairment than Perrin et al.'s report, suggesting potential cultural differences in psychological distress reporting or methodological variations in assessment (15).

The demographic and clinical profiles of our participants also showed interesting contrasts with prior research. At the same time, our sample had a higher proportion of females (57.4%), which aligns well with Shahbaz et al, who reported that the majority of their patients were females (16). Hussain et al also documented more than 50% female diabetic patients in their study (22).

CONCLUSION

In conclusion, diabetic foot ulcer patients experience potential impairment in health-related quality of life, particularly in physical functioning and pain domains. Clinical factors like infection and neuropathy were present in the majority of the patients, which can be major contributors to this decline.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB-45/Endo/LRH)

Consent for publication

Approved

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

FAHEEM UR RAHMAN (Fellow)

Conception of Study, Development of Research Methodology Design, Drafting and Review of Manuscript, Data Collection, Data Entry, Data Analysis, and Final Approval of Manuscript.

Manuscript drafting

MUJEEB UR RAHMAN (Assistant Professor)

Manuscript revisions, and Critical input.

UMME SALMA (Fellow)

Literature Search, and Critical Input.

KAMRAN MANAN (Fellow)

Literature Search, and Critical Input.

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