Research Article

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# Factors Influencing Health-Related Quality of Life among Adults with Diabetic Foot Ulcers in Wenzhou, China

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## Abstract

**Background:** Diabetic foot ulcers (DFUs) are a serious complication of diabetes that can substantially impair physical functioning, psychological well-being, and health-related quality of life (HRQoL). **Objective:** To identify predictors of HRQoL among adults with DFUs in Wenzhou, China. **Methods:** A predictive correlational cross-sectional study was conducted among 118 hospitalized adults with DFUs at the First Affiliated Hospital of Wenzhou Medical University between February and December 2025. Data were collected using validated Chinese-language questionnaires, including a demographic questionnaire, the Diabetic Foot Ulcer Scale–Short Form (DFS-SF), the Patient Health Questionnaire-9 (PHQ-9), the Multidimensional Scale of Perceived Social Support (MSPSS), the Chinese Diabetes Management Self-Efficacy Scale (C-DMSES), and the Diabetic Foot Self-Care Questionnaire. Data were analyzed using descriptive statistics, Pearson's correlation coefficients, and multiple linear regression analysis. **Results:** The mean DFS-SF score was 65.66 (SD = 20.88), with higher scores indicating poorer HRQoL. The final multiple regression model explained 40.3% of the variance in HRQoL ($R^2$ = .403, $p < 0.001$). Depression was the only statistically significant independent predictor of HRQoL ($\beta = 0.606$, $p < 0.001$). **Conclusions:** HRQoL was impaired among hospitalized adults with DFUs, and depressive symptoms were the only statistically significant

independent predictor of poorer HRQoL. Routine depression screening and psychological support should be considered as components of comprehensive DFU care.

**Keywords:** Diabetic Foot Ulcers; Health-Related Quality of Life; Depression; Self-Efficacy; Social Support.

**What was Known**

• Diabetic foot ulcers substantially impair patients' physical, psychological, and social well-being.

• Previous studies have shown that depression, self-efficacy, social support, and self-care are associated with health-related quality of life; however, evidence regarding their independent contributions to health-related quality of life among adults with diabetic foot ulcers in China remains limited.

**What's New and Next**

• Depression was the only statistically significant independent predictor of poorer health-related quality of life among adults with diabetic foot ulcers in Wenzhou, China.

• These findings highlight the importance of routine psychological assessment and consideration of targeted psychological support as components of comprehensive diabetic foot care.

## Introduction

Diabetes mellitus (DM) is a major chronic non-communicable disease and an important global public health challenge. An estimated 589 million adults aged 20–79 years were living with diabetes worldwide in 2024, and China has the largest population of adults with diabetes, with an estimated prevalence of approximately 12.4% among adults aged 18 years and older [1-2]. Type 2 diabetes mellitus (T2DM) accounts for more than 90% of diabetes cases and affects approximately 141–148 million adults in China [3]. In Wenzhou, Zhejiang Province, more than 331,000 newly diagnosed cases were reported between 2016 and 2023 [4]. The increasing burden of diabetes highlights the importance of preventing and effectively managing its complications.

Diabetes is associated with multiple macrovascular and microvascular complications, including cardiovascular disease, stroke, chronic kidney disease, retinopathy, and lower-extremity complications [5-6]. Among these, diabetic foot ulcers (DFUs) are particularly debilitating and costly. DFUs commonly develop through the interaction of peripheral neuropathy, peripheral arterial disease, and infection, which can impair wound healing and increase the risk of tissue destruction and amputation [7-8]. Globally, diabetic foot disease affects approximately 6.3% of people with diabetes,

with substantial regional variation, and its incidence in China has been reported to be approximately 8.1% [9]. DFUs may result in prolonged hospitalization, recurrent infection, impaired mobility, disability, amputation, and premature mortality, placing substantial clinical and economic burdens on patients and healthcare systems [10-11].

Beyond physical and economic consequences, DFUs substantially affect patients' psychological and social well-being and may adversely affect health-related quality of life (HRQoL). Persistent wounds, pain, restricted mobility, prolonged treatment, and fear of amputation may interfere with daily activities and social participation [12-13]. HRQoL is an important patient-centered outcome because it reflects individuals' perceptions of the effects of illness and its treatment on physical, psychological, and social functioning [12]. Previous studies have consistently reported impaired HRQoL among patients with DFUs across different populations and healthcare settings [14]. Poorer HRQoL has also been associated with greater ulcer severity and various clinical and psychosocial characteristics, including diabetes-related complications and depressive symptoms [15].

The revised Wilson and Cleary model proposed by Ferrans et al.[16] provides a useful framework for understanding the multidimensional factors associated with HRQoL. The model integrates biological and physiological factors, symptom status, functional status, general health perceptions, and overall quality of life, while recognizing the influence of individual and environmental characteristics. This framework is particularly relevant to DFUs because HRQoL may be affected not only by physical and functional consequences but also by psychological, behavioral, and social factors.

Based on this framework and previous empirical evidence, self-efficacy, self-care behavior, depression, and social support were selected as potentially important factors associated with HRQoL. Self-efficacy may enhance confidence in disease self-management and has been positively associated with quality of life among patients with diabetes and DFUs [17-18]. Self-care behaviors, including foot care, wound care, medication adherence, blood glucose monitoring, and timely healthcare seeking, are essential for preventing DFU progression and recurrence and may contribute to better quality of life [19-20]. Conversely, depression may adversely affect psychological well-being, self-management, and perceived health, and has been associated with poorer quality of life among patients with diabetes and DFUs [21-22]. Social support, including emotional, informational, instrumental, and appraisal support, may facilitate coping, treatment adherence, and psychological

adjustment and has been positively associated with quality of life among patients with diabetes and DFUs [23-24].

Although previous studies have identified depression, self-efficacy, social support, and self-care behavior as factors associated with HRQoL among patients with diabetes and DFUs, limited evidence has examined their combined contribution to HRQoL among adults with DFUs in Wenzhou, China. Differences in healthcare systems, sociocultural contexts, disease characteristics, and available support may also influence the factors associated with HRQoL across populations. Therefore, examining these factors simultaneously within the Wenzhou context may provide clinically and locally relevant evidence for patient-centered and multidisciplinary DFU care.

Accordingly, this study aimed to identify the factors predicting HRQoL among adults with DFUs in Wenzhou, China, with particular emphasis on self-efficacy, self-care behavior, depression, and social support. The findings may contribute to a better understanding of psychosocial and behavioral factors associated with HRQoL and provide evidence to inform nursing practice, psychological support, and multidisciplinary management of adults with DFUs.

## Materials and Methods

*Study design and setting*

A predictive correlational study was conducted among adult patients with DFUs who were hospitalized at the First Affiliated Hospital of Wenzhou Medical University, China. Data were collected using self-administered questionnaires from February to December 2025.

*Study population and sampling*.

*Population*

The study population consisted of adults aged 18–60 years with DFUs who were hospitalized at the First Affiliated Hospital of Wenzhou Medical University in Wenzhou, China.

*Participants and sample size*

The study sample consisted of adult patients with DFUs who were hospitalized in the Endocrinology Department, Wound Repair Department, or Burn Department of the First Affiliated Hospital of Wenzhou Medical University, Wenzhou, China. The minimum sample size was calculated a priori using G*Power version 3.1.9.7 for multiple linear regression with four predictors. Assuming a medium effect size ($f^2$ = 0.15), a significance level of $\alpha$ = .05, and 90% power, the minimum required sample size was 108 participants [25]. A total of 118 participants were recruited to account for potential incomplete or nonresponse data.

Participants were eligible if they (1) were aged 18–60 years; (2) were able to communicate in Mandarin or the Wenzhou dialect; (3) had no serious comorbidities, such as heart disease, kidney disease, or stroke, and no documented history of mental illness in their medical records; and (4) had a DFU classified as Wagner grade 1–5. Patients with gestational diabetes or a previous diagnosis of depression were excluded.

*Sampling technique*

Simple random sampling was used to recruit participants from daily lists of eligible patients. Each weekday between 8:00 and 9:00 a.m., a registered nurse who was independent of the research team screened consecutive clinic attendees and compiled a list of eligible patients. Three to five patients were then selected each day by drawing numbered, identical slips from a container without replacement. Recruitment continued until the target sample of 118 participants was reached.

*Data collection*

Following ethical approval, data were collected by the researcher. A total of 118 eligible participants were enrolled in the study. Before data collection, the researcher explained the study, provided a participant information sheet, and obtained written informed consent. Participants completed the questionnaires in a private room at the hospital, taking approximately 30 minutes. The researcher provided assistance as needed, including reading questionnaire items aloud to participants with visual difficulties or limited literacy. Rest breaks were offered to participants experiencing fatigue. All participants completed the questionnaires at the hospital. Completed questionnaires were checked for completeness and assigned identification codes to protect confidentiality. Data were entered into a password-protected database accessible only to the research team.

*Research Instruments*

Permission to use all study instruments was obtained from the original authors and the developers of the Chinese versions before data collection. Data were collected through face-to-face interviews using standardized questionnaires administered by the researcher in a private room. The questionnaire was divided into 6 sections

1) Demographic and clinical data were obtained through participant interviews and a review of medical records, as appropriate. The data included age, sex, marital status, education level, living arrangement, monthly income, medical payment method, smoking status, alcohol consumption, duration of diabetes, diabetic foot clinic visits, number of foot ulcers, and history of toe amputation.

2) Diabetic foot ulcer-related HRQoL was assessed using the Chinese version of the Diabetic Foot Ulcer Scale–Short Form (DFS-SF) [26]. The DFS-SF consists of 28 items rated on a 5-point Likert scale, with response options ranging from 1 to 5. The total score ranges from 28 to 140, with higher scores indicating poorer HRQoL. The total score was calculated by summing the scores across all items. In the present study, the DFS-SF demonstrated excellent internal consistency, with a Cronbach's alpha coefficient of 0.96.

3) Depression was assessed using the Chinese version of the Patient Health Questionnaire-9 (PHQ-9) [27]. The PHQ-9 consists of nine items assessing depressive symptoms experienced during the previous two weeks. Each item is rated on a 4-point scale from 0 (not at all) to 3 (nearly every day), resulting in a total score ranging from 0 to 27. Higher scores indicate more severe depressive symptoms. In the present study, the PHQ-9 demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.90.

4) Social support was assessed using the Chinese version of the Multidimensional Scale of Perceived Social Support (MSPSS) [28]. The MSPSS consists of 12 items across three subscales: Family Support, Friends Support, and Significant Other Support, with four items in each subscale. Each item is rated on a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). Total scores range from 12 to 84, with higher scores indicating greater perceived social support. In the present study, the MSPSS demonstrated good internal consistency, with a Cronbach's alpha coefficient of 0.92.

5) Self-efficacy was assessed using the Chinese version of the Diabetes Management Self-Efficacy Scale (C-DMSES) [29]. The C-DMSES consists of 20 items rated on an 11-point scale ranging from 0 (cannot do at all) to 10 (certainly can do). A mean score is calculated across all items, with higher scores indicating greater diabetes management self-efficacy. In the present study, the C-DMSES demonstrated excellent internal consistency, with a Cronbach's alpha coefficient of 0.96

6) Self-care behavior was assessed using the Chinese version of the Diabetic Foot Self-Care Questionnaire of the University of Malaga (DFSQ-UMA) [30]. The DFSQ-UMA consists of 16 items covering personal care, foot care, and footwear. Each item is rated on a 5-point scale from 1 to 5 according to the participant's level of self-care behavior. Total scores range from 16 to 80, with higher scores indicating better diabetic foot self-care behavior. In the present study, the DFSQ-UMA demonstrated acceptable internal consistency, with a Cronbach's alpha coefficient of 0.76.

***Statistical Analysis***

Data were analyzed using IBM SPSS Statistics version 32.0. Descriptive statistics were used to summarize participants' demographic and clinical characteristics and study variables. Pearson's correlation coefficient was used to examine bivariate associations among the study variables. Multiple linear regression using the enter method was performed to identify predictors of HRQoL. The assumptions of multiple linear regression were assessed using residual histograms, normal Q–Q plots, residual scatterplots, variance inflation factors (VIFs), and the Durbin–Watson statistic. The assumptions were satisfactorily met. The Durbin–Watson statistic was 1.739, and VIF values ranged from 1.13 to 1.33, indicating no evidence of problematic multicollinearity. Statistical significance was set at $p < .05$.

## Results

*1.Participant characteristics*

Among the 118 participants, most were male (83.1%), aged 51–60 years (62.7%), married (90.7%), and lived with family or others (98.3%). Half of the participants had completed primary school or less (50.0%) and reported a monthly income of 2,000–5,000 yuan (50.0%). Most participants had social health insurance (97.5%). Approximately half of the participants had never smoked (50.8%), while 42.4% had lived with diabetes for 10–20 years. Most participants had a single diabetic foot ulcer (90.7%), and 71.2% had two diabetes-related complications. Nearly one-third (31.4%) had a history of toe amputation, whereas 68.6% had no history of toe amputation (Table 1).

**Table 1** Participant characteristics (n=118)

| Characteristic | n (%) |
|---|---|
| **Sex** | |
| Male | 98 (83.1) |
| Female | 20 (16.9) |
| **Age (years)** | |
| 18–30 | 2 (1.7) |
| 31–40 | 6 (5.1) |
| 41–50 | 36 (30.5) |
| 51–60 | 74 (62.7) |
| **Marital status** | |
| Married | 107 (90.7) |
| Not married | 11 (9.3) |
| **Living arrangement** | |
| Living alone | 2 (1.7) |
| Living with family or others | 116 (98.3) |
| **Education** | |
| Primary school or below | 59 (50.0) |
| Secondary school | 37 (31.4) |
| Vocational certificate/Bachelor's degree | 22 (18.6) |
| **Monthly income (yuan)** | |
| < 2,000 | 32 (27.1) |
| 2,000–5,000 | 59 (50.0) |
| > 5,000 | 27 (22.9) |
| **Medical payment method** | |
| Social health insurance | 115 (97.5) |
| Out-of-Pocket payment | 3 (2.5) |

**Table 1** Participant characteristics (n=118) (Cont.)

| Characteristic | n (%) |
|---|---|
| **Smoking status** | |
| Current smoker | 26 (22.0) |
| Former smoker | 32 (27.2) |
| Never smoker | 60 (50.8) |
| **Duration of diabetes (years)** | |
| < 10 | 46 (39.0) |
| 10–20 | 50 (42.4) |
| ≥ 20 | 22 (18.6) |
| **Number of ulcers** | |
| 1 | 107 (90.7) |
| ≥ 2 | 11 (9.3) |
| **Number of complications** | |
| 1 complication | 33 (28.0) |
| 2 complications | 84 (71.20) |
| 3 complications | 1 (0.80) |
| **History of toe amputation** | |
| None | 81 (68.6) |
| One or more | 37 (31.4) |
| **Number of toe amputations** | |
| 0 | 81 (68.6) |
| 1 | 28 (23.8) |
| 2 | 8 (6.8) |
| ≥ 3 | 1 (0.80) |

*2. Health-related quality of life*

The mean diabetic foot ulcer–related health-related quality of life (HRQoL) score was 65.66 (SD = 20.88), with higher scores indicating poorer HRQoL. The mean domain scores were 14.62 (SD = 6.02) for leisure, 12.86 (SD = 5.71) for dependence/daily life, 12.65 (SD = 3.53) for bothered by ulcer care, 9.61 (SD = 4.74) for negative emotions, 8.50 (SD = 3.65) for worried about ulcers/feet, and 7.42 (SD = 3.21) for physical health (Table 2).

**Table 2** Health-related quality of life, by domain (n = 118)

| Variables | Mean (SD) | Range | |
|---|---|---|---|
| | | Actual range | Possible range |
| Health-related quality of life (overall) | 65.66 (20.88) | 32-130 | 28-140 |
| Health-related quality of life (classified by domains) | | | |
| - Leisure | 14.62 (6.02) | 5-25 | 5-25 |
| - Dependence/daily life | 12.86 (5.71) | 5-25 | 5-25 |
| - Bothered by ulcer care | 12.65 (3.53) | 5-20 | 4-20 |
| - Negative emotions | 9.61 (4.74) | 6-26 | 6-30 |
| - Worried about ulcers/feet | 8.50 (3.65) | 4-20 | 4-20 |
| - Physical health | 7.42 (3.21) | 4-18 | 4-20 |

*3. Descriptive Statistics of Study Variables*

The mean score for self-care behavior was 33.29 (SD = 7.66), self-efficacy had a mean of 136.07 (SD = 29.39), the mean social support was 68.79 (SD = 8.52) and depression showed a mean of 1.98 (SD = 3.32). (Table 3).

**Table 3** Descriptive Statistics of Study Variables (n = 118)

| Variables | Mean (SD) | Range | |
|---|---|---|---|
| | | Actual range | Possible range |
| Self-care behavior | 33.29 (7.66) | 19-56 | 16-80 |
| Self-efficacy | 136.07 (29.39) | 4-199 | 0-200 |
| Social support | 68.79 (8.52) | 40-84 | 12-84 |
| Depression | 1.98 (3.32) | 0-21 | 0-27 |

*4.Correlations Among Study Variables*

The correlation analysis showed that none of the correlations among the study variables exceeded |r| = .80, indicating no evidence of problematic multicollinearity. Depression was significantly and positively correlated with HRQoL (r = .619, p < .01), whereas self-efficacy was significantly and negatively correlated with HRQoL (r = -.258, p < .01). In contrast, self-care behavior was positively but not significantly correlated with HRQoL (r = .177, p > .05), while social support was not significantly correlated with HRQoL (r = -.007, p > .05) (Table 4).

**Table 4** Pearson Correlations among studied variables (n = 118)

| Variables | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Self-care behavior | 1 | | | | |
| 2. Self-efficacy | -.433** | 1 | | | |
| 3. Social support | -.319** | .213* | 1 | | |
| 4. Depression | .236* | -.301** | -.170 | 1 | |
| 5. Healthy-related quality of life (HRQoL) | .177 | -.258** | -.007 | .619** | 1 |

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

*5. Factors Predicting Health-Related Quality of life*

Multiple linear regression analysis was performed to identify factors predicting HRQoL among adults with diabetic foot ulcers. The regression model explained 40.3% of the variance in diabetic foot ulcer-related HRQoL ($R^2$ = 0.403, adjusted $R^2$ = 0.382, F = 19.080, p < .001). Depression was the only significant independent predictor of HRQoL ($\beta$ = 0.606, p < .001). Self-care behavior ($\beta$ = 0.038, p = .654), self-efficacy ($\beta$ = −0.086, p = .304), and social support ($\beta$ = 0.127, p = .104) were not significant predictors after adjustment for the other variables (Table 5).

**Table 5** Factors Predicting Health-Related Quality of life

| Variables | b | SE | Standardized Beta ($\beta$) | t | p-value |
|---|---|---|---|---|---|
| Constant | 1.467 | 0.686 | | 2.139 | 0.035 |
| Self-care behavior | 0.059 | 0.131 | 0.038 | 0.450 | 0.654 |
| Self-efficacy | -0.040 | 0.039 | -0.086 | -1.033 | 0.304 |
| Social support | 0.133 | 0.081 | 0.127 | 1.638 | 0.104 |
| Depression | 1.225 | 0.156 | 0.606 | 7.863 | <0.001 |

Note: R = 0.635; $R^2$ = 0.403; adjusted $R^2$ = 0.382; F = 19.080; SE, standard error

## Discussion

This study examined health-related quality of life (HRQoL) and its predictors among adults with diabetic foot ulcers (DFUs) in Wenzhou, China. The mean DFU-related HRQoL score was 65.66 (SD = 20.88), based on a possible raw score range of 28–140, with higher scores indicating poorer HRQoL. Although the instrument does not provide established cutoff scores for classifying HRQoL levels, this finding provides insight into DFU-related quality-of-life burden in the study population. Previous studies have also reported associations between DFUs and impairments in physical functioning, psychological well-being, and daily activities [31,32]. The HRQoL burden observed in this study may be related to the physical and functional consequences of long-standing diabetes and DFUs. Many participants had lived with diabetes for 10 years or longer, had multiple diabetes-related complications, and some had a history of toe amputation. These clinical conditions may restrict mobility and daily activities, increase dependence on others, and heighten concerns about ulcer progression and further amputation [7, 32]. This interpretation is consistent with the revised Wilson and Cleary model, in which biological and physiological factors may influence symptom status, functional status, and general health perceptions, ultimately affecting HRQoL [16].

Multiple linear regression analysis showed that the four study variables explained 40.3% of the variance in diabetic foot ulcer-related HRQoL ($F = 19.080$, $p < .001$). Depression was the only significant independent predictor ($\beta = .606$, $p < .001$), whereas self-efficacy, self-care behavior, and social support were not significant after adjustment for the other variables. Because higher DFS-SF scores indicate poorer HRQoL, greater depressive symptoms were associated with poorer HRQoL. Depression was also positively correlated with poorer HRQoL ($r = .619$, $p < .01$), consistent with previous studies among patients with diabetic foot ulcers [21,33]. Persistent wounds, pain, impaired mobility, prolonged treatment, recurrent ulceration, and concerns about amputation may contribute to psychological distress, while depressive symptoms may reduce motivation, coping, and participation in daily and social activities [33]. These findings are consistent with the revised Wilson and Cleary model, in which psychological characteristics may influence HRQoL through symptom experience, functional status, and general health perceptions [16]. However, the cross-sectional design precludes causal inference.

Self-efficacy was negatively correlated with poorer HRQoL ($r = -.258$, $p < .01$) but was not an independent predictor after adjustment ($\beta = -.086$, $p = .304$). This may indicate that its relationship with HRQoL overlaps with other factors in the model, particularly depression. Consistent with the

revised Wilson and Cleary model and Bandura's Social Cognitive Theory, self-efficacy may influence HRQoL indirectly through coping, self-management behaviors, and psychological pathways [16-17].

Self-care behavior and social support were neither significantly correlated with HRQoL nor significant independent predictors. Their effects on HRQoL may operate indirectly through psychological, behavioral, or functional pathways [16]. Self-care is important for diabetic foot management, while social support may facilitate coping and self-management and has been associated with better quality of life among patients with diabetic foot ulcers [23,34]. The nonsignificant association between social support and HRQoL may partly reflect the relatively high perceived social support in this sample, most of whom were married and lived with family members or others. However, this interpretation remains tentative because potential mediating pathways and restricted variability in social support were not directly examined.

These findings highlight the importance of psychological well-being in adults with diabetic foot ulcers. Assessment of depressive symptoms and appropriate psychological support should be considered as components of comprehensive diabetic foot care alongside wound management, glycemic control, and self-care education. Further longitudinal and intervention studies incorporating both psychosocial and clinical factors are needed to clarify their relationships with HRQoL.

## Limitation

This study has several limitations. The single-center, cross-sectional design limits the generalizability of the findings and precludes causal inference regarding the relationships between the study variables and HRQoL. Self-reported psychosocial measures may also be subject to response bias. In addition, potentially important clinical factors, such as ulcer severity, pain, infection, glycemic control, and ulcer duration, were not included in the regression model and may have contributed to unexplained variation in HRQoL. Future multicenter and longitudinal studies incorporating both psychosocial and clinical factors are warranted to clarify their relationships with HRQoL among adult patients with diabetic foot ulcers.

## Conclusion

These findings highlight the importance of psychological well-being in adults with diabetic foot ulcers. Assessment of depressive symptoms and appropriate psychological support should be considered alongside wound management, glycemic control, and self-care education. Nurses can play an important role in identifying depressive symptoms, providing basic psychosocial support, and

facilitating timely referral when needed. Integrating psychological assessment into routine DFU care may promote a more holistic and patient-centered approach. Further longitudinal and intervention studies incorporating psychosocial and clinical factors are needed to clarify their relationships with HRQoL and evaluate nursing-led interventions.

## Ethical Approval Statement

Ethical approval was obtained from the Ethics Approval Committee of Burapha University, Thailand ((Approval Code: G-HS123/2567[C1]) and is valid from January 10, 2025, to January 10, 2026) and the Research Ethics Board of the First Hospital of Wenzhou Medical University, China (Registration Code: KY2024-314, approval date: 14 December 2024). Written informed consent was obtained from all participants before data collection. Participants were informed that participation was voluntary and that they could withdraw from the study at any time without affecting their access to healthcare services. Anonymity and confidentiality were maintained throughout the study, with access to the data restricted to the research team. Data were analyzed and reported in aggregate form to protect participants' privacy.

## Author Contributions

All authors contributed significantly to this work. HZ, CN and SM were involved in the study design, data collection, data analysis, and writing of the main manuscript text. HZ, CN, SM and LX contributed to the study design and discussion, as well as the editing and revision of the manuscript.

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## Conflicts of Interest

The authors have no conflicts of interest to declare.

## References


1. International Diabetes Federation. IDF Diabetes Atlas. 11th ed. Brussels: International Diabetes Federation; 2025.
2. Chinese Diabetes Society. Guideline for the prevention and treatment of diabetes mellitus in China (2024 edition). Chin J Diabetes Mellitus. 2025;17(1):16–139. doi:10.3760/cma.j.cn115791-20241203-00705.
3. Tang X, Yan X, Zhou H, Yang X, Niu X, Liu J, et al. Prevalence and identification of type 1 diabetes in Chinese adults with newly diagnosed diabetes. Diabetes Metab Syndr Obes. 2019;12:1527–1541. DOI:10.2147/DMSO.S202193
4. Liu J, Liu M, Chai Z, Li C, Wang Y, Shen M, et al. Projected rapid growth in diabetes disease burden and economic burden in China: a spatio-temporal study from 2020 to 2030. Lancet Reg Health West Pac. 2023;33:100700. doi:10.1016/j.lanwpc.2023.100700.
5. American Diabetes Association Professional Practice Committee. 12. Retinopathy, neuropathy, and foot care: Standards of Care in Diabetes—2025. Diabetes Care. 2025;48(Suppl 1):S252–S265. DOI:10.2337/dc25-S012
6. Harding JL, Pavkov ME, Magliano DJ, Shaw JE, Gregg EW. Global trends in diabetes complications: a review of current evidence. Diabetologia. 2019;62(1):3–16. DOI:10.1007/s00125-018-4711-2
7. Armstrong DG, Tan TW, Boulton AJM, Bus SA. Diabetic foot ulcers: a review. JAMA. 2023;330(1):62-75. DOI:10.1001/jama.2023.10578
8. Boulton AJM, Viswanathan V. Evidence-based management of diabetic foot problems. Diabetes Res Clin Pract. 2025;229:112932. DOI:10.1016/j.diabres.2025.112932
9. Genitsaridi I, Salpea P, Salim A, Sajjadi SF, Tomic D, James S, et al. 11th edition of the IDF Diabetes Atlas: global, regional, and national diabetes prevalence estimates for 2024 and projections for 2050. Lancet Diabetes Endocrinol. 2026;14(2):149-156. DOI:10.1016/S2213-8587(25)00299-2
10. Waibel FWA, UÇkay I, Soldevila-Boixader L, Sydler C, Gariani K. Current knowledge of morbidities and direct costs related to diabetic foot disorders: a literature review. *Front Endocrinol (Lausanne).* 2024;14:1323315. DOI:10.3389/fendo.2023.1323315

11. Lazzarini PA, Raspovic KM, Meloni M, van Netten JJ. A new declaration for feet's sake: halving the global diabetic foot disease burden from 2% to 1% with next generation care. *Diabetes Metab Res Rev.* 2024;40(3):e3747. DOI:10.1002/dmrr.3747
12. Hanlon CA, et al. Beyond the wound: a scoping review of the psychosocial impact of diabetes-related foot ulcers. *Diabet Med.* 2026;43:e70243. DOI:10.1111/dme.70243
13. Gunbas M, Dervisoglu M, Buyukkaya Besen D. The silent threat: how diabetic foot ulcers and the fear of amputation shape patients' lives: a qualitative exploration of patient experiences. *Adv Skin Wound Care.* 2026;39(6):314-320. DOI:10.1097/ASW.0000000000000470
14. Byrnes J, Ward L, Jensen S, Sagoo M, Charles D, Mann R, et al. Health-related quality of life in people with different diabetes-related foot ulcer health states: a cross-sectional study of healed, non-infected, infected, hospitalised and amputated ulcer states. Diabetes Res Clin Pract. 2024;207:111061. DOI:10.1016/j.diabres.2023.111061
15. Hermanns N, Kittel P, Cerletti P, Kulzer B, Ehrmann D. Independent associations of mental health and diabetes complications with health-related quality of life: evidence from a cross-sectional study. Diabetes Obes Metab. 2026;28(3):2383-2392. DOI:10.1111/dom.70434
16. Ferrans CE, Zerwic JJ, Wilbur JE, Larson JL. Conceptual model of health-related quality of life. J Nurs Scholarsh. 2005;37(4):336-342. DOI:10.1111/j.1547-5069.2005.00058.x.
17. Bandura A. Self-efficacy. In: Ramachaudran VS, editor. Encyclopedia of human behavior. Vol. 4. New York: Academic Press; 1994. p. 71-81.
18. Nonpanya U, Terathongkum S, Lininger J. Effects of self-efficacy enhancement of foot care program on foot care behavior and insensate foot among persons with type 2 diabetes. Thai J Nurs Midwifery Pract. 2021;7(2):76-91.
19. Kim EJ, Han KS. Factors related to self-care behaviours among patients with diabetic foot ulcers. J Clin Nurs. 2020;29(9-10):1712-1722. DOI:10.1111/jocn.15215
20. Yentarue A, Navicharern R. Factors related to health-related quality of life among diabetic patients with foot ulcers, tertiary care hospitals in Bangkok. J Phrapokklao Nurs Coll Chanthaburi. 2022;33(1):80-92.
21. Tafurt-Cardona Y, Noscue-Narváez MA, Pacheco-DÍaz MD, Perdomo-Méndez YV, Perdomo-Rojas MM, Mendoza-Pérez P, et al. Ansiedad, depresión y calidad de vida en pacientes adultos con pie diabético. *Psicol Caribe.* 2025;42(2):9-28.

DOI:10.14482/psdc.42.2.419.653

22. Bechara N, Hawke FE, Gunton JE, Tehan PE. Cognition and quality of life in patients with a diabetes-related foot ulcer. J Tissue Viability. 2025;34(3):100913. DOI:10.1016/j.jtv.2025.100913
23. Luo R, Ji Y, Liu YH, Sun H, Tang S, Li X. Relationships among social support, coping style, self-stigma, and quality of life in patients with diabetic foot ulcer: a multicentre, cross-sectional study. Int Wound J. 2023;20(3):716-724. DOI:10.1111/iwj.13914
24. Hanlon M, McGuire BE, MacGilchrist C, Kirwan E, NÍ Neachtain D, Dhatariya K, et al. Beyond the wound: a scoping review of the psychosocial impact of diabetes-related foot ulcers. Diabet Med. 2026;43(4):e70243. DOI:10.1111/dme.70243
25. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. Behav Res Methods 2009; 41(4):1149-1160. DOI:10.3758/BRM.41.4.1149
26. Ma L, Ma W, Lin S, Li Y, Ran X. Adaptation and validation of the diabetic foot ulcer scale-short form scale for Chinese diabetic foot ulcers individuals. Int J Environ Res Public Health. 2022;19(21):14568. DOI:10.3390/ijerph192114568
27. Wang W, Bian Q, Zhao Y, Li X, Wang W, Du J, et al. Reliability and validity of the Chinese version of the Patient Health Questionnaire (PHQ-9) in the general population. Gen Hosp Psychiatry. 2014;36(5):539-544. DOI:10.1016/j.genhosppsych.2014.05.021
28. Wang Y, Wan Q, Huang Z, Huang L, Kong F. Psychometric properties of multi-dimensional scale of perceived social support in Chinese parents of children with cerebral palsy. Front Psychol. 2017;8:2020. DOI:10.3389/fpsyg.2017.02020
29. Wu SFV, Courtney M, Edwards H, McDowell J, Shortridge-Baggett LM, Chang PJ. Development and validation of the Chinese version of the Diabetes Management Self-efficacy Scale. Int J Nurs Stud. 2008;45(4):534-542. DOI:10.1016/j.ijnurstu.2006.08.020
30. Zhang Y, Li L. Reliability and validity of the Chinese version of the diabetic foot self-care questionnaire of the University of Malaga. J Nurs Sci. 2019;34(2):31-33. Chinese. DOI:10.3870/j.issn.1001-4152.2019.02.031
31. Khunkaew S, Fernandez R, Sim J. Health-related quality of life among adults living with diabetic foot ulcers: a meta-analysis. *Qual Life Res.* 2019;28(6):1413-27. DOI:10.1007/s11136-018-2082-2

32. Alvaro-Afonso FJ, Garcia-Madrid M, Garcia-Morales E, Lopez-Moral M, Molines-Barroso RJ, Lazaro-Martinez JL. Health-related quality of life among Spanish patients with diabetic foot ulcer according to Diabetic Foot Ulcer Scale-Short Form. *J Tissue Viability.* 2024;33(1):5-10. DOI:10.1016/j.jtv.2023.11.011
33. Alkhatieb M, Alghamdi N, Ghandorah AM, Alshehri A, Alamri A, Almalki MA, et al. Health-related quality of life and psychological impact on patients post-amputation due to diabetic foot ulcer. *Cureus.* 2026;18(4):e107290. DOI:10.7759/cureus.107290
34. Zhu X, et al. Foot self-care behaviour in primary care patients with diabetic foot ulcers: structural equation modelling of psychological predictors. *Int Wound J.* 2024;21(5):e14897. DOI:10.1111/iwj.14897