

Investigation of the Relationship between Alexithymia and Social Appearance Anxiety in Individuals with Diabetic Foot Ulcers

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ABSTRACT

Objective: This study aimed to explore the relationship between alexithymia and social appearance anxiety in individuals with diabetic foot ulcers.

Methods: Conducted between January and December 2024, this descriptive and correlational study included 141 individuals diagnosed with diabetic foot ulcers who were admitted to a training and research hospital in eastern Turkey. Data were collected using the Descriptive Information Form, the Toronto Alexithymia Scale (TAS), and the Social Appearance Anxiety Scale (SAAS). Descriptive statistics and normality tests were used to analyze the demographic data and scale scores. Pearson correlation and simple regression analyses were employed to examine the relationship between the scales.

Results: The mean score for the Toronto Alexithymia Scale was 58.46 ± 9.97 , while the mean score for the Social Appearance Anxiety Scale was 45.70 ± 12.05 . A significant positive correlation was found between alexithymia and social appearance anxiety ($r = 0.645$, $P < .001$). Regression analysis indicated that alexithymia explained 41.6% of the variance in social appearance anxiety ($R = 0.645$, $R^2 = 0.416$, $F = 99.095$, $P < .001$).

Conclusion: A statistically significant relationship was found between alexithymia and social appearance anxiety in individuals with diabetic foot ulcers. Furthermore, higher alexithymia scores were associated with higher levels of social appearance anxiety.

Keywords: Alexithymia, anxiety, body image, diabetic foot, foot ulcer

INTRODUCTION

The complex relationship between psychological factors and physical health outcomes has garnered increasing attention in recent years, particularly in the context of chronic conditions such as diabetes. Diabetes is associated with a range of complications, among which diabetic foot ulcers (DFU) stand out as a significant concern. DFU affects approximately 15% of individuals with diabetes and often leads to severe consequences, including hospitalization and amputation.^{1,2} Beyond the physical challenges such as pain, limited mobility, and dependence on others, individuals with DFU frequently experience psychological difficulties. Emotional struggles, including depression, anxiety, body image concerns, and social isolation, are commonly observed in this population.³⁻⁵

Alexithymia is a condition characterised by difficulties in understanding and expressing emotional experiences.⁶ It is a common feature among individuals with diabetes, with a recent meta-analysis revealing that 43% of type 2 diabetes patients experience alexithymia, a figure significantly higher than the general population.⁷ A further study reported that alexithymia (poor awareness of bodily sensations) was observed in patients with type 2 diabetes, leading to an inability to recognise and express thoughts and feelings.⁸ However, the alexithymic levels of patients with diabetic foot ulcers, one of the major complications of diabetes, remain to be elucidated.² Alexithymic individuals tend to exhibit somatic complaints as they struggle to fully articulate the physical and emotional symptoms they experience. This may lead to delay in seeking appropriate and timely medical care.^{9,10} Furthermore, a study highlighted that individuals with alexithymia symptoms often lack sufficient social support from family, friends, or significant others, which can result in social isolation, a more limited lifestyle, and delays in seeking help.¹¹

Received 19.01.2025
Revision Requested 08.12.2025
Last Revision 10.12.2025
Accepted 28.01.2026
Publication Date 13.03.2026

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Cite this article: Sarpdağı Y, Çapık C, Yıldız M, Zorer B, Çiftçi N. Investigation of the Relationship Between Alexithymia and Social Appearance Anxiety in Individuals with Diabetic Foot Ulcers. *J Nursology*. 2025;29(1):35-41. doi:

10.17049/jnursology.1622993



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Social appearance anxiety, a type of social anxiety, refers to the fear of being judged negatively based on one's physical appearance and can be particularly pronounced in individuals with DFU, as these ulcers can lead to stigmatisation and social withdrawal.^{12,13} Social appearance anxiety is associated with many concepts, such as body image and self-esteem.¹⁴ It has been reported that body image disorder, characterised by a pervasive sense of dissatisfaction with one's body, is prevalent among individuals with diabetes in the middle and later stages of life.¹⁵ The examination of body image in individuals with diabetes is of particular significance in light of the escalating prevalence of diabetes and the established connection between weight, diet, and effective diabetes management.^{16,17} Individuals with DFU encounter numerous alterations in their daily routines, including restricted mobility, discomfort, sleep disturbances, wound drainage, unpleasant odours, and the frequent necessity for dressing changes, often multiple times a day.¹⁸ These factors can contribute to an escalation in their social appearance anxiety.

Moreover, the presence of social appearance anxiety has the potential to inhibit self-care behaviours that are vital for the management of DFUs and the prevention of complications.¹⁹ Body image issues among patients with chronic health conditions are relatively neglected, despite the fact that most health problems have the potential to alter one's body as a direct consequence of illness or treatment.²⁰

Additionally, it is thought that concerns about social appearance may negatively affect self-care behaviors, which are important for the management of diabetic foot ulcers and the prevention of complications. Despite physical changes directly resulting from the disease itself or the treatment process, concerns about body image have emerged as a relatively neglected area in clinical research. From a clinical perspective, emotional awareness and body-related concerns may play a role in patients' adaptation to chronic wounds, compliance with treatment, and participation in foot care.

In summary, investigating the link between alexithymia and social appearance anxiety in individuals with diabetic foot ulcers is critical to understanding how emotional processing deficits may influence social and psychological well-being in this vulnerable group. To the authors' knowledge, there are no studies examining alexithymia and social appearance anxiety together in this patient group.

AIM

The aim of this study was to evaluate the levels of

alexithymia and social appearance anxiety in individuals with diabetic foot ulcers and the relationship between these two factors.

Research questions

- What are the alexithymic levels of diabetic foot ulcer patients?
- What are the social appearance anxiety levels of the diabetic foot ulcer patients?
- Is there a meaningful relationship between alexithymia level and social appearance anxiety?
- Does alexithymia predict social appearance anxiety?

METHODS

Design

This cross-sectional and descriptive study was conducted between January and December 2024 at Health Sciences University Van Training and Research Hospital.

Participants

The study population comprised individuals admitted to Health Sciences University Van Training and Research Hospital with a diagnosis of diabetic foot ulcer, who met the research criteria and applied to the hospital between January 2024 and December 2024. The sample size of the study was calculated with the G*Power 3.1.9.4 programme, taking into account the low effect size ($d = 0.3$), margin of error ($\alpha = 0.05$) and 95% power ($1 - \beta = 0.95$). The minimum sample size was determined as 122 participants; however, a total of 141 individuals were included in the study. Post-hoc analysis ($d = 0.3$, $\alpha = 0.05$, total $n = 141$) revealed a statistical power of 97%. The data collection process was not confined to patients attending the hyperbaric unit, but also encompassed individuals attending the diabetes outpatient clinic or admitted to the internal medicine ward who met the inclusion criteria. The inclusion criteria were as follows: Patients must be aged 18 years or older. Patients must have a diagnosis of Type 1 or Type 2 diabetes. Patients must have a diagnosis of diabetic foot ulcer. Patients must have an open wound or ulcer on the foot. Patients must have a history of foot deformity or amputation. Individuals with a psychiatric illness, individuals under 18 years of age, individuals with no evidence of diabetic foot ulcers, and individuals who did not agree to participate in the study were excluded from the study.

Data Collection

Data collection tools of the study: The study employed three instruments for the collection of data: the Introductory Information Form, the Toronto Alexithymia Scale (TAS), and the Social Appearance Anxiety Scale (SAAS). Data were collected through face-to-face

interviews with individuals who visited the specified clinics and met the inclusion criteria for the study.

Introductory Information Form: The researchers developed the Introductory Information Form following a review of the relevant literature on the topic. It included questions regarding age, gender, marital status, education level, income, the presence of other chronic conditions, and details about foot-related issues.

Toronto Alexithymia Scale-20 (TAS-20): The TAS-20 is a 20-item self-report scale developed by Bagby et al. in 1992 and widely used today.²¹ Turkish validity and reliability studies were conducted by Güleç et al. The scale is a five-point Likert-type measurement tool. Participants are instructed to select the option that best reflects their level of agreement or disagreement with each statement on a five-point scale ranging from 'Never' to 'Always'. The scale comprises three sub-dimensions: difficulty in recognising emotions (items 1, 3, 6, 7, 9, 13, 14), difficulty in verbalising emotions (items 2, 4, 11, 12, 17) and expressive thinking (items 5, 8, 10, 15, 16, 18, 19, 20). Scores on this scale, for which Cronbach's alpha coefficient is 0.78, range from 20 to 100, with higher scores indicating a higher level of alexithymia. Scoring is based on the total score of the items, and items 4, 5, 10, 18 and 19 are calculated by reverse scoring.²² Güleç and Yenel's²³ study posited that individuals who attained a score of 52 and above on the scale exhibited alexithymic characteristics, with a cut-off point established at 59.²³ The Cronbach's alpha value was 0.81 in this study.

Social Appearance Anxiety Scale (SAAS): The Social Appearance Anxiety Scale was developed by Hart et al.¹³ to

Ethical Approval

The research has been approved by the Scientific Research and Publication Ethics Committee of Muş Alparslan University (Document Date and Number: 11/12/2023-120928). Institutional permission (dated 10.01.2024 and numbered E-36866945-508.01-233777208) was also obtained in the institution where the research was conducted. Prior to participation, the subjects were provided with comprehensive information regarding the objectives of the study, the methodology to be employed, and the time commitment required. They were also assured that their involvement would not result in any harm and that their participation was entirely voluntary. The principles outlined in the Helsinki Declaration of Human Rights were adhered to, with a strong emphasis on the protection of individual rights. Based on the information stated above, verbal and written consent was obtained from the participants.

measure the emotional, cognitive and behavioural concerns that individuals experience about their appearance.¹³ Doğan²⁴ conducted the scale's Turkish validity and reliability study. The SAAS is a five-item Likert scale with 16 items. Scores on the one-dimensional scale range from 16, representing the lowest possible value, to 80, representing the highest possible value. In the SAAS, the first item is reverse scored. In the original study, the Cronbach α coefficients of the scale were 0.84,¹³ and 0.93 in the Turkish validity and reliability study.²⁴ The Cronbach's alpha value was 0.91 in this study.

Statistical Analysis

The data were processed using IBM SPSS (IBM SPSS Corp., Armonk, NY, USA) for Windows 22 software, with descriptive statistics such as frequency, percentage, minimum and maximum values, mean, and standard deviations employed in the analysis. In order to assess the normality of the distribution, kurtosis and skewness values were calculated, with a kurtosis-skewness range of (+1.5 to -1.5) being considered indicative of a normal distribution.²⁵ The study confirmed that the variables followed a normal distribution. Independent samples t-tests were used to compare two groups, and one-way ANOVAs were used to compare more than two groups. Pearson correlation analysis was also used to explore relationships. Simple regression analysis was used to assess the effect of the Toronto Alexithymia Scale on social appearance anxiety. Cronbach's alpha was used to assess the internal consistency of the scales. To ensure the reliability of the data, all analysis was conducted with a 95% level of confidence and a significance threshold of $P < .001$, with significance set at $P < .05$ for all analyses.

RESULTS

As seen in Table 1, 60.3% of the participants were male, 76.6% were married, 39.7% were primary school graduates, 53.9% had an income less than their expenses, 61.0% had a chronic disease other than diabetes, and 38.3% had information about foot problems. The mean age of the participants was 55.88 ± 7.26 years. No statistically significant differences in TAS scores were found across gender ($P = .834$), marital status ($P = .962$), level of education ($P = .493$), income status ($P = .241$), presence of chronic diseases other than diabetes ($P = .364$) and knowledge of foot problems ($P = .053$). No statistically significant differences in SAAS scores were found across gender ($P = .747$), marital status ($P = .848$), level of education ($P = .553$), income status ($P = .381$), presence of chronic diseases other than diabetes ($P = .066$) and knowledge of foot problems ($P = .135$) (Table 1).

Table 1. Comparison of alexithymia and social appearance anxiety mean scores with descriptive characteristics of participants (n=141)

Variables	n(%)	Alexithymia Mean+ SD	Social Appearance Anxiety Mean +SD
Gender			
Woman	56 (39.7)	58.67±8.97	46.10±11.76
Male	85(60.3)	58.31±10.63	45.43±12.31
Test and significance		t=.210, P=.834	t=.323, P=.747
Marital Status			
Married	108(76.6)	58.48 ±9.39	45.56±11. 57
Single	33(23.4)	58.40±11.14	45.97±13.09
Test and significance		t=.048, P=.962	t=-.192, P=.848
Education Level			
Literate	34(24.1)	55.45±10.81	43.15±13.27
Primary education	56(39.7)	58.57±9.18	45.21±11.45
Secondary Education	29(20.6)	59.16±8.88	46.76±11.85
University	22(15.6)	59.80±12.25	47.96±13.08
Test and significance		F=.806, P=.493	F=.701, P=.553
Income Status			
Income less than expenditure	76(53.9)	58.60±9.34	46.27±11.90
Income equals expenditure	46(32.6)	56.95±10.34	43.82±12.08
Income more than expenditure	19(13.5)	61.52±11.27	47.94±12.62
Test and significance		F=1.437, P=.241	F=.972, P=.381
Chronic disease other than diabetes			
Yes	86(61.0)	57.84 ±9.90	44.20±11.91
No	55(39.0)	59.41±10.10	48.03±12.01
Test and significance		t=-.911, P=.364	t=-1.854, P=.066
Information about foot problems			
Yes	54(38.3)	60.51±10.66	47.62±12.92
No	87(61.7)	57.18±9.35	44.50±11.40
Test and significance		t=1.949, P=0.053	t=.059, P=.135
Numeric Variables	Min.-Max.	Mean+SD	
Age	40.00-76.00	55.88±7.26	

SD, Standard Deviation; t, t-test in independent groups; F, One-Way Variance Anova Test; Min-Max., minimum – maximum

As seen in Table 2, the mean total score of the SAAS was 45.70 ± 12.05 . The mean total score of the TAS was 58.46 ± 9.97 . When the sub-dimensions of the TAS were examined, the mean score of the Difficulty in Recognising Emotions sub-dimension was 19.71 ± 4.57 , the mean score of the Difficulty in Verbalising Emotions sub-dimension was 14.56 ± 3.18 and the mean score of the Expressive Thinking sub-dimension was 24.18 ± 4.00 (Table 2).

Table 2. Mean and Distribution of Social Appearance Anxiety Scale, Toronto Alexithymia Scale and Subscale Scores (n=141)

Variables	Mean ±SD (Min.-Max)
Social Appearance Anxiety Scale	45.70±12.05 (25.00-73.00)
Toronto Alexithymia Scale	58.46±9.97 (31.00-84.00)
Difficulty in Recognising Emotions	19.71±4.57 (7.00-30.00)
Difficulty in Verbalising Emotions	14.56±3.18 (7.00-23.00)
Expressive Thinking	24.18±4.00 (11.00-34.00)
Min-Max., minimum – maximum, SD; Standard Deviation	

It revealed a statistically significant and positive correlation between SAAS and the total score of the TAS ($r = 0.645$, $P < .001$), indicating that higher levels of alexithymia are associated with higher levels of social appearance anxiety. Additionally, SAAS was positively correlated with Difficulty in Recognising Emotions ($r = 0.610$, $P < .001$), Difficulty in Verbalising Emotions ($r = 0.606$, $P < .001$), and Expressive Thinking ($r = 0.429$, $P < .001$). These findings indicate that the alexithymia subscales increase as social appearance anxiety increases (Table 3).

Table 3. Investigation of the Relationship between the Social Appearance Anxiety Scale and Toronto Alexithymia Scale and its Subscales (n=141)

		Toronto Alexithymia	Difficulty in Recognising Emotions	Difficulty in Verbalising Emotions	Expressive Thinking
Social Appearance Anxiety	r	.645**	.610**	.606**	.429**
	P	<.001	<.001	<.001	<.001
	n	141	141	141	141
r, Pearson correlation analysis; **P < .001					

According to the regression analysis, TAS score had a significant and strong effect on the SAAS (beta = 0.645, $P < .001$). A one-unit increase in TAS score was associated with a 0.780-unit increase in SAAS score. The model explained 41.6% of the total variance ($R^2 = 0.416$) and was generally statistically significant ($F = 99.095$, $P < .001$). The standard β value was 0.645, and it was observed that an increase in TAS scores led to a significant increase in SAAS scores. The 95% confidence interval ranged from 0.625 to 0.935, and these findings reveal that alexithymia level is a strong predictor of social appearance anxiety (Table 4).

Table 4. Regression Analysis Between Social Appearance Anxiety Scale and Toronto Alexithymia Scale (n=141)

Social Appearance Anxiety Scale (dependent variable)							
	Beta	Standard Error	Standard Beta	t	P	%95 Confidence Interval	
Constant coefficient	.110	4.646	-	.024	0.981	-9.075	9.296
TAS	0.780	0.078	0.645	9.955	<.001	0.625	0.935
R	Model 1: 0.645						
R ² Change	Model 1: 0.416						
F/ P	Model 1: 99.095/ <.001						
R, Linear regression; P<.001; TAS, Toronto Alexithymia Scale							

DISCUSSION

The present study found no statistically significant differences between the Alexithymia and Social Appearance Anxiety scores and variables including gender, marital status, level of education, income status, presence of chronic disease and knowledge of foot problems ($P>.05$). The mean total score of the TAS was 58.46 ± 9.97 and the mean total score of the SAAS was 45.70 ± 12.05 . Positive and significant relationships were identified between the SAAS and TAS, as well as its sub-dimensions ($P<.001$). Furthermore, it was determined that Toronto Alexithymia scores functioned as a robust predictor of Social Appearance Anxiety (beta=0.645, $R^2=0.416$, $P<.001$), with 41.6% of social appearance anxiety being attributable to alexithymia.

Although this study focused on individuals with diabetic foot ulcers, there are no specific studies in the literature examining alexithymia in this group. Therefore, the findings were compared with previous studies measuring alexithymia in individuals with diabetes. In this study, the mean total score of the TAS for individuals with diabetic foot ulcers was 58.46 ± 9.97 . This result is similar to the mean scores obtained in the following studies (55.26 ± 9.20 , 56.92 ± 9.05 , 52.2 ± 16.3), but presented a slightly higher mean.^{26,27} A recent systematic review and meta-analysis on alexithymic in individuals with diabetes yielded a pooled mean score of 57.70 for the TAS-20 total scale.⁷ Common clinical consensus suggests that individuals with a TAS-20 total score of 61 or higher exhibit high alexithymia, scores between 52 and 60 indicate possible alexithymia, and scores of 51 or lower indicate no alexithymia.²¹ The score of 58.46 obtained in this study is in the range of possible alexithymia, suggesting that individuals with diabetic foot ulcers may exhibit a lower capacity for emotional awareness compared to individuals with diabetes without foot ulcers. This observation suggests that a complex and long-term condition such as diabetic foot ulcer may potentially lead to the emergence of psychological distress in affected individuals.

In this study, the mean total score of the SAAS in individuals with diabetic foot ulcers was 45.70 ± 12.05 . In studies

conducted on different sample groups, the mean scores of Social Appearance Anxiety were found as follows: 32.6 ± 8.6 in individuals with facial skin diseases²⁸, 39.38 ± 17.71 in burn patients²⁹ and 34.30 ± 9.35 in women who underwent mastectomy.³⁰ Since there is no study measuring social appearance anxiety in diabetic patients or individuals with diabetic foot ulcers, we compared the results obtained in different sample groups, especially in patients with wounds or surgical operations that may affect social appearance anxiety. The higher social appearance anxiety scores obtained in our study suggest that factors such as the fact that diabetic foot ulcers can leave permanent scars on the body and the length of the treatment process may have increased individuals' anxiety about their social appearance. This may have led to a more pronounced fear of being ostracised or creating a negative impression in the social environment. In addition, the fact that a chronic disease such as diabetic foot ulcer causes patients to face not only physical but also psychological difficulties may have led to higher social appearance anxiety compared to other sample groups.

Diabetic foot ulcer is a significant complication that can occur in individuals with diabetes, impacting not only their physical health but also their mental well-being and social interactions.^{2,5,31} In this study, it was found that as the alexithymic levels of individuals increased, their social appearance anxiety also increased. In addition, regression analysis revealed that TAS had a strong effect on SAAS and this relationship was significant. This indicates that individuals with high alexithymia level are more likely to experience social appearance anxiety. Keating et al.³² suggest that individuals who struggle to recognize and differentiate emotions from physical sensations may find themselves overwhelmed by negative feelings, which could lead them to direct these emotions toward unfavorable judgments about their appearance. A recent meta-synthesis study examining the perceptions of patients with DFU found that women with foot ulcers experience changes in body image due to restrictions in clothing and footwear, leading to lower self-esteem and reduced confidence in participating in social activities.³³ In addition, in a study conducted on a different sample group, a positive

relationship was found between social appearance anxiety and alexithymia.³⁴ These findings support our study. This relationship between alexithymia and social appearance anxiety suggests that open wounds on the feet of individuals may lead to social stigmatisation and social isolation due to fear of social rejection. This situation reveals that a holistic approach that takes into account the psychosocial needs of these individuals should be adopted in the treatment process.

Limitations

The study's limitations can be categorised as follows. Firstly, it was conducted in only one province. Secondly, the data were collected via self-report. Thirdly, the cross-sectional design may have introduced limitations in determining changes over time and causal relationships.

The findings of this study demonstrate that alexithymia level exerts a substantial influence on social appearance anxiety in individuals afflicted with diabetic foot ulcers, thereby underscoring the significance of nurses' focus on not only the physical symptoms but also the emotional and psychosocial well-being of these individuals. Nurses are well-positioned to cultivate empathy-based approaches, particularly for those who encounter challenges in identifying and articulating their emotions, and to administer supportive interventions aimed at mitigating their anxiety. In this context, training programs designed to enhance emotional awareness in individuals can be developed in collaboration with mental health experts. Such interventions have the potential to reduce social anxiety, enhance treatment compliance, and improve the overall quality of life for individuals with diabetic foot ulcers.

Ethics Committee Approval: Ethics committee approval was obtained from the Muş Alparslan University Scientific Research and Publication Ethics Committee (Date: 11/12/2023, Number: 120928).

Informed Consent: All participants were provided with detailed information prior to the study, were assured that their data would be kept confidential, and their written consent was obtained.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept -YS, MY; Design-YS, CÇ; Supervision- CÇ, NÇ, YS, MY, BZ; Resources- YS; Data Collection and/or Processing- YS, BZ; Analysis and/or Interpretation- YS, MY; Literature Search- YS; Writing Manuscript- YS, MY; Critical Review- CÇ

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Use of Artificial Intelligence: No artificial intelligence tools or supporting applications were used in the design of this study, or in the collection, analysis, or interpretation of the results.

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