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ORIGINAL RESEARCH

Depression and Anxiety in Patients with Rosacea and Their Impact on Quality of Life: A Cross-Sectional Study

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Purpose: Rosacea is a long-term skin condition that causes redness and irritation on the face and is often accompanied by emotional challenges such as anxiety and depression. This study aimed to investigate the prevalence of depression and anxiety in patients with rosacea and examine their impact on quality of life, aiming to provide a basis for comprehensive clinical evaluation of the physical and psychological harm caused by the disease and for targeted treatments.

Methods: A total of 209 patients with rosacea who received treatment and the control group comprised 163 patients with isolated plantar warts. Depression, anxiety, and quality of life were assessed using the Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), and Dermatology Life Quality Index (DLQI). Group differences were made using *t*-tests and χ^2-tests, and logistic regression was employed for association analysis.

Results: Patients with rosacea had significantly higher mean scores for depression, anxiety, and quality of life impairment than controls ($P < 0.05$). The proportions of patients with mild to severe depression, anxiety, and significant quality of life impairment were also higher in the rosacea group, with statistically significant differences ($P < 0.05$). Among patients with rosacea, both mild and moderate-to-severe depression and anxiety were associated with an increased risk of severe quality of life impairment ($P < 0.05$). Furthermore, joint effect analysis showed that patients with both depression and anxiety had a markedly higher risk of severe quality of life impairment compared with those without either condition ($P < 0.05$).

Conclusion: Rosacea is strongly associated with depression and anxiety, whose coexistence confers the greatest risk of quality-of-life impairment. Incorporating psychological screening and care into routine management may improve patient outcomes.

Plain Language Summary: Rosacea is a long-term skin condition that causes redness and irritation on the face. Many people with rosacea also experience emotional challenges, such as feeling anxious or depressed, but few studies have explored how these feelings affect their daily lives.

In this study, we compared 209 people with rosacea to 163 people without the condition. All participants completed questionnaires that measured their levels of depression, anxiety, and quality of life. The results showed that people with rosacea were more likely to have depression and anxiety. Even mild symptoms were associated with poorer quality of life, and those with both depression and anxiety had the greatest impairment.

These findings highlight that rosacea is not only a skin condition but also has important emotional and social impacts. The results suggest that doctors should pay attention to both the physical and psychological needs of people living with rosacea. Providing psychological support and addressing emotional well-being may help improve patients' overall quality of life.

Keywords: rosacea, depression, anxiety, quality of life

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Introduction

Rosacea is a chronic inflammatory skin disease primarily characterized by persistent erythema and capillary dilation, commonly affecting the central part of the face.[1] Although its exact pathogenesis remains incompletely understood, multiple lines of evidence implicate genetic predisposition, immune system dysfunction, neurovascular dysregulation, disruption of the skin barrier, and changes in skin microbiota as key contributing factors.[1–3]

Rosacea is widely prevalent across the globe.[4,5] A recent large-scale epidemiological survey involving more than 20 countries reported an overall global prevalence of 5.1% and a prevalence of 4.0% in East Asia, with the highest rates observed among individuals aged 25–39 years.[6] According to the Chinese Guidelines for the Diagnosis and Treatment of Rosacea (2021 edition), the disease most commonly affects women between 20 and 50 years of age, although it can also occur in children and older adults.[7] Rosacea often leads to visible facial lesions and physical discomfort, such as burning, stinging, and itching, which can interfere with patients' daily lives.[1] Despite the availability of multiple therapeutic options, achieving complete and sustained remission remains challenging.[8]

Beyond its physical symptoms, rosacea imposes a considerable psychosocial burden. As a facial disfiguring condition, it can induce feelings of shame, embarrassment, and social withdrawal, which may contribute to the development of depression and anxiety.[9,10] Previous studies have reported a high prevalence of these mental health disorders in patients with rosacea, with some surveys showing rates exceeding 50%.[11,12] A 2022 systematic review and meta-analysis found that rosacea was associated with a 2.44-fold increased risk of depression and a 2.18-fold increased risk of anxiety.[13] In addition, numerous studies have shown that patients with rosacea have significantly lower health-related quality of life compared with healthy controls.[14] However, few studies have comprehensively examined how depression and anxiety jointly affect quality of life in patients with rosacea.

Therefore, this study aimed to examine the prevalence of depression and anxiety in patients with rosacea and their impact on quality of life. Understanding this relationship may help evaluate the overall burden of rosacea and support the development of targeted, multidisciplinary treatment strategies.

Materials and Methods

Participants

A total of 209 patients with rosacea who received treatment at the Department of Dermatology of the Beijing Changping District Hospital of Integrated Traditional Chinese and Western Medicine between May 2025 and August 2025 were prospectively enrolled as the case group, comprising 77 males and 132 females. Inclusion criteria were: (1) age between 18 and 60 years; (2) diagnosis of rosacea according to the 2021 Chinese Guidelines for the Diagnosis and Treatment of Rosacea;[7] and (3) provision of written informed consent to participate in the study. Exclusion criteria were: (1) presence of other facial disfiguring skin disorders (eg, melasma, vitiligo, seborrheic dermatitis, acne); (2) prior history of diagnosed psychiatric disorders, current use of antidepressant or anti-anxiety medications or receipt of psychological therapy; (3) incomplete or poor-quality questionnaire data.

The control group comprised 163 patients with isolated plantar warts (70 males and 93 females, aged 18–60 years) who attended the same dermatology outpatient department during the same period. The diagnosis of plantar warts was made according to the diagnostic criteria outlined in Dermatology and Venereology. All control participants had no other dermatological conditions and no history of psychological therapy. Patients with plantar warts were selected as the control group because plantar warts are a common dermatological condition that does not affect facial appearance and is generally associated with minimal psychosocial burden, allowing us to control for the presence of a skin disease while minimizing psychological confounding.

Research Methods

Questionnaire Survey

A questionnaire survey was administered to collect data on demographic characteristics, depressive and anxiety symptoms, and quality of life levels of the participants. All questionnaires were completed through face-to-face interviews conducted by trained researchers during the treatment process, and responses were verified on site to ensure completeness and data quality.

Demographic information included age, sex, educational level, and occupation.

Depressive and anxiety symptoms were assessed using the Self-Rating Depression Scale (Self-rating depression scale, SDS)[15] and the Self-Rating Anxiety Scale (Self-rating Anxiety Scale, SAS),[16] which are self-report instruments consisting of 20 items each, rated on a 4-point scale (1–4). Participants were classified as having mild, moderate, or severe symptoms according to standardized cutoffs (SDS: <53, normal; 53–62, mild; 63–72, moderate; >72, severe. SAS: <50, normal; 50–59, mild; 60–69, moderate; >70, severe).

Quality of life was assessed using the Dermatology Life Quality Index (DLQI). There are 10 questions, including the following topics: symptoms, embarrassment, shopping and home care, clothes, social and leisure, sport, work or study, close relationships, sex, treatment. Each question is scored from 0 to 3, giving a possible score range from 0 (meaning no impact of skin disease on quality of life) to 30 (meaning maximum impact on quality of life). Based on established thresholds, participants were categorized as experiencing no impact (0–1), mild impact (2–5), moderate impact (6–10), severe impact (11–20), or extremely severe impact (21–30).

Statistical Analysis

Statistical analyses were performed using SPSS version 26.0. The normality of continuous variables was evaluated using histograms, the Shapiro–Wilk test, and the Kolmogorov–Smirnov test. Descriptive statistics were calculated as means and standard deviations ($\overline{x} \pm s$) for normally distributed continuous variables and as frequencies and percentages for categorical variables. Between-group differences in continuous variables were assessed using independent-samples t tests, while differences in categorical variables were analyzed using the chi-square (χ^2) test.

According to established scoring criteria, the total scores of the SDS, SAS, and DLQI were converted into categorical variables. Binary logistic regression analysis was applied to examine the associations between depression, anxiety, and quality of life impairment. All statistical tests were two-tailed, and a p-value < 0.05 was considered statistically significant.

Results

Sample Characteristics

The baseline characteristics of the participants are summarized in Table 1. The rosacea and control groups were comparable in terms of age, gender, educational level, and occupational type. The mean age did not differ significantly between the rosacea group (42.07 ± 9.14 years) and the control group (41.43 ± 8.09 years; P = 0.474). Female participants accounted for 63.16% in the rosacea group and 57.06% in the control group, with no significant difference between groups (P = 0.232). Educational attainment (P = 0.919) and occupational type (P = 0.410) were also similar between groups.

Table 1 Baseline Demographic Characteristics of Participants

Variable	Rosacea Group (n=209, %)	Control Group (n=163, %)	t/χ^2	*P value*
Age (years), mean ± SD	42.07 ± 9.14	41.43 ± 8.09	0.717	0.474[a]
Sex				
Male	77 (36.84)	70 (42.94)	1.427	0.232[b]
Female	132 (63.16)	93 (57.06)		
Educational level				
High school or below	19 (9.09)	18 (11.04)	0.501	0.919[b]
Vocational/associate degree	57 (27.27)	45 (27.61)		
Bachelor's degree	95 (45.45)	73 (44.79)		
Master's degree or above	38 (18.18)	27 (16.56)		
Occupation				
Indoor	190 (90.91)	152 (93.25)	0.678	0.410[b]
Outdoor	19 (9.09)	11 (6.75)		

Notes: [a]*P*-value by independent sample *t* test; [b]*P*-value by χ^2 test.

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Group Differences in Depression, Anxiety, and Quality of Life

Independent-samples t tests were used to compare the mean scores of depression, anxiety, and quality of life between the two groups, and the results are summarized in Table 2. The rosacea group showed significantly higher mean scores for depression, anxiety, and quality of life impairment compared with the control group ($P < 0.001$). According to established scoring criteria, raw depression and anxiety scores were further converted into categorical variables (normal, mild, and moderate-to-severe), and group differences were analyzed using chi-square (χ^2) tests. The proportions of participants with mild or moderate-to-severe depression and anxiety were significantly higher in the rosacea group than in the control group ($P < 0.001$). For the Dermatology Life Quality Index (DLQI), as no participants met the criterion for extremely severe impairment, scores were dichotomized into mild-to-moderate versus severe impairment. Chi-square (χ^2) analysis showed that the proportion of participants with severe quality of life impairment was significantly higher in the rosacea group than in the control group ($P < 0.001$).

Impact of Depression and Anxiety on Quality of Life in Patients with Rosacea

As shown in Table 3, a binary logistic regression model was applied to examine the associations of depression and anxiety with quality of life impairment in patients with rosacea, adjusting for age, sex, educational level, and occupation

Table 2 Between-Group Comparisons of Depression, Anxiety, and Quality of Life

Variable	Rosacea Group (n=209, %)	Control Group (n=163, %)	t/χ^2	*P value*
Depression	52.16±11.46	45.82±11.12	5.359	<0.001[a]
Normal	90 (43.06)	118 (72.39)	32.166	<0.001[b]
Mild	88 (42.11)	35 (21.47)		
Moderate-to-severe	31 (14.83)	10 (6.13)		
Anxiety	54.72±10.88	44.72±14.49	7.338	<0.001[a]
Normal	60 (28.71)	101 (61.96)	23.422	<0.001[b]
Mild	59 (28.23)	32 (19.63)		
Moderate-to-severe	90 (43.06)	30 (18.40)		
DLQI	9.70±4.62	7.44±2.89	5.783	<0.001[a]
Mild-to-moderate	128 (61.24)	138 (84.66)	24.650	<0.001[b]
Severe impairment	81 (38.76)	25 (15.34)		

Notes: [a]*P*-value by independent sample *t* test; [b]*P*-value by χ^2 test.

Table 3 Binary Logistic Regression Analysis of the Association Between Depression, Anxiety, and Severe Quality of Life Impairment in Patients with Rosacea

Variable	Quality of Life Impaired		OR (95% CI)	*P value*
	Mild-to-Moderate (n=128, %)	Severe (n=81, %)		
Depression				
Normal	71 (55.47)	19 (23.46)	1	
Mild	43 (33.59)	45 (55.56)	4.00 (1.94~8.28)	<0.001[a*]
Moderate-to-severe	14 (10.94)	17 (20.99)	4.63 (1.79~11.98)	0.002[a*]
Anxiety				
Normal	54 (42.19)	17 (20.99)	1	
Mild	43 (33.59)	30 (37.04)	2.33 (1.09~5.00)	0.03[a*]
Moderate-to-severe	31 (24.22)	34 (41.98)	3.22 (1.48~7.00)	0.003[a*]

Notes: [a]*P*-value by binary logistic regression. *Adjusted for age, sex, educational level, and occupation.
Abbreviations: OR, Odds Ratio; CI, Confidence Interval.

Table 4 Binary Logistic Regression Analysis of the Impact of Comorbid Depression and Anxiety on the Severe Quality of Life Impairment in Patients with Rosacea

Variable	Quality of Life Impaired		OR (95% CI)	*P value*
	Mild-to-Moderate (n=97, %)	Severe (n=53, %)		
Depression& Anxiety				
None	47 (48.45)	4 (7.55)	1	
Depression and Anxiety	50 (51.55)	49 (92.45)	11.74 (3.69~37.41)	<0.001[a*]

Notes: [a]*P*-value by binary logistic regression. *Adjusted for age, sex, educational level, and occupation.
Abbreviations: OR, Odds Ratio; CI, Confidence Interval.

as covariates. For depression, compared with patients without depressive symptoms, those with mild depression had a 4.00-fold higher risk of experiencing severe quality of life impairment, and those with moderate-to-severe depression had a 4.63-fold higher risk ($P < 0.05$). For anxiety, patients with mild anxiety had a 2.33-fold higher risk of severe quality of life impairment compared with those without anxiety, and those with moderate-to-severe anxiety had a 3.22-fold higher risk ($P < 0.05$). Given the frequent coexistence of depression and anxiety, we further examined their combined impact on quality of life. As shown in Table 4, patients with neither depression nor anxiety served as the reference group. Compared with this group, patients with both depression and anxiety had an 11.74-fold higher risk after adjustment for covariates.

Discussion

Rosacea is a common chronic inflammatory skin disorder, yet its exact pathogenesis remains incompletely understood. Current evidence suggests that its development involves multiple contributing factors, including genetic susceptibility, immune dysregulation, neurovascular abnormalities, disruption of the skin barrier, and alterations in the skin microbiota.[3,17–19] Clinically, rosacea usually affects the central facial region and is characterized by recurrent flushing, persistent erythema, papules, pustules, and telangiectasia.[20] As a visible and potentially disfiguring facial condition, rosacea not only causes physical symptoms such as itching and stinging but also adversely affects facial appearance, imposes a considerable psychological burden, and diminishes patients' quality of life. Therefore, evaluating the psychological status and quality of life of individuals with rosacea is crucial for a comprehensive assessment of disease burden and for developing targeted prevention and treatment strategies within a biopsychosocial medical framework.

Depression and anxiety are among the most common mental disorders. Depression is a mood disorder characterized by persistent sadness and a loss of interest or pleasure, and it is a leading cause of disability and reduced healthy life years worldwide.[21] Anxiety is characterized by excessive fear, tension, or avoidance of perceived threats, often resulting in ongoing psychological and physical distress.[22,23] In our study, patients with rosacea had significantly higher mean scores for both depression and anxiety compared with the control group, and the proportions of individuals with mild or moderate-to-severe symptoms were also markedly higher. These differences were statistically significant. Similarly, a cross-sectional study conducted in China in 2021 reported that the prevalence of depression and anxiety in patients with rosacea exceeded 50%.[24] Moreover, a 2022 systematic review and meta-analysis found that rosacea was associated with a 2.443-fold increased risk of depression and a 2.181-fold increased risk of anxiety.[25] These findings are consistent with our results, and suggest several additional biological pathways that may mediate the link between rosacea and mental disorders. Elevated pro-inflammatory cytokines such as IL-1β, IL-8 and IL-17 have been demonstrated in rosacea and are positively correlated with anxiety and depressive symptoms in observational studies.[26] Sensory-nerve activation, via release of neuropeptides such as CGRP and interaction with γδ T cells, appears to aggravate both cutaneous inflammation and vascular responses, amplifying skin symptoms and potentially contributing to psychological distress.[27] Moreover, signaling pathways including the IL-17/JAK-STAT cascade and upregulation of angiogenic factors such as VEGF may also play a role in promoting persistent inflammation and neuroimmune dysregulation, which could underlie both somatic and affective symptoms.[26,28]

Rosacea commonly affects visible areas of the face and can substantially impair patients' daily lives. Although multiple treatment options are available, achieving a complete cure remains challenging.[29,30] In the present study, patients with rosacea had significantly higher mean scores on the Dermatology Life Quality Index (DLQI) than those in the control group, and the proportion of individuals experiencing severe impairment of quality of life was markedly higher. These findings are consistent with previous research. A survey conducted by the National Rosacea Society in the United States reported that rosacea imposes a considerable burden on health-related quality of life.[31] Several domestic studies have similarly shown elevated DLQI scores among rosacea patients, suggesting a notable decline in their quality of life.[32,33] A cross-sectional study further reported that 73.9% of patients experienced a moderate-to-severe impact on their quality of life,[24] and a 2024 systematic review and meta-analysis found that individuals with rosacea had lower quality of life compared with healthy controls.[34] Collectively, these studies support our findings that rosacea significantly impairs patients' quality of life. The decline in quality of life among patients with rosacea may be explained by the combined impact of multiple mechanisms. First, physical symptoms and discomfort play a central role. These symptoms can cause ongoing physical discomfort and pain, interfere with daily self-care activities, and require continuous medical treatment. The chronic and recurrent nature of the disease can also lead to frustration and fatigue, further lowering overall well-being.[35] Moreover, the psychological stress from anticipating negative evaluation by others can amplify the disease burden and further heighten emotional distress.[36] Such psychosocial challenges may intensify the subjective impact of rosacea beyond its physical manifestations.

The results also indicated that both mild and moderate-to-severe depression and anxiety significantly increased the likelihood of severe quality of life impairment compared with individuals without these symptoms. Consistent with our findings, a retrospective study conducted in 2024 in the Yunnan Plateau region of China reported that patients with rosacea had lower quality of life and a higher risk of anxiety compared with healthy individuals.[37] Similarly, another study found that rosacea is associated with poorer sleep quality.[38] The relationship between psychological status and quality of life in rosacea is likely bidirectional. On one hand, quality of life assessments encompass physical, psychological, and social domains, and psychological status is a key component; depression and anxiety directly lower patients' perceived quality of life. On the other hand, the disfiguring facial symptoms of rosacea may contribute to the development of depression and anxiety. Psychological distress not only exacerbates rosacea symptoms but also increases the emotional burden patients face in daily life, work, and social interactions,[39] thereby further diminishing their physical, psychological, and social well-being.

Previous studies have explored depression, anxiety, and quality of life in patients with rosacea, with many focusing primarily on disease severity or clinical characteristics as predictors of psychological outcomes. However, these studies generally evaluated depression and anxiety separately and did not specifically examine their combined effects on quality of life.[40] In contrast, our study further applied binary logistic regression analysis of the impact of comorbid depression and anxiety on the severe quality of life impairment in patients with rosacea, and the result demonstrated that their coexistence was associated with the greatest impairment in quality of life. This finding suggests that depression and anxiety may have additive or combined effects on patients' quality of life and highlights the importance of considering psychological comorbidity. Similar patterns have been reported in psychiatric research, showing that depression and anxiety frequently co-occur and that their comorbidity is associated with greater functional impairment, as demonstrated in large cohort studies.[41] Previous studies have consistently shown that the co-occurrence of depression and anxiety is associated with poorer quality of life. This may be explained by the broader and more severe functional impairment observed in comorbid cases, as depression and anxiety affect overlapping but distinct psychological and behavioral domains. When both conditions are present, patients may experience additive impairments in emotional well-being, daily functioning, and social participation, which are core components of quality of life. These findings provide important opinion for our observation that rosacea patients with coexisting depression and anxiety exhibited the greatest impairment in quality of life.[42,43]

Limitations

Due to its observational design, several limitations should be noted. The study was conducted in a single clinical center and involved a relatively limited sample size, which may reduce the generalizability of the findings and limit the

statistical power, particularly for detecting subtle associations. Although several demographic variables (age, gender, education level, occupation) were controlled for, other potential confounders such as disease duration and treatment status were not assessed and may have influenced the results. In addition, rosacea disease severity was not graded using clinician-rated scales, which prevented evaluation of the association between disease severity and psychological comorbidity. Furthermore, the cross-sectional nature of the study precludes any causal inferences regarding the relationships between rosacea, depression, anxiety, and quality of life. Future studies using multicenter and longitudinal designs with larger and more diverse samples are needed to confirm these results and clarify how mental health symptoms contribute to quality of life outcomes in patients with rosacea.

Conclusion

In summary, rosacea is associated with an increased risk of depression and anxiety, both of which are significantly linked to impaired quality of life. Additionally, their coexistence is associated with the highest quality-of-life impairment. Therefore, in addition to guideline-based medical treatment, clinicians are encouraged to screen for depression and anxiety. Integrated psychological care may help improve quality of life in patients with rosacea. Future studies assessing rosacea disease severity and exploring potential shared pathogenic mechanisms may further clarify the relationship between rosacea, psychological comorbidity, and quality of life.

Data Sharing Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Medical Ethics Committee of the Beijing Changping District Hospital of Integrated Traditional Chinese and Western Medicine (Ethics Review No. [2025] 03). Written informed consent was obtained from all individual participants prior to enrollment in the study.

Consent for Publication

No identifiable personal information, images, or recordings of individual participants are included in the manuscript. The authors confirm that informed consent can be provided to the journal editorial office upon request.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that there are no competing interests in relation to the work.

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