Dermatology Practical & Conceptual

The Psychosocial Impact of Chronic Facial Dermatoses in Adults

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ABSTRACT

Introduction: Skin diseases have negative psychological and social consequences, especially when they are chronic and affect a visible area of the body, such as the face.

Objectives: The purpose of this study is to investigate and compare the psychosocial impact of three common chronic dermatoses of the face: acne, rosacea, and seborrheic dermatitis.

Methods: The Dermatology Life Quality Index (DLQI), Hospital Anxiety and Depression Scale (HADS), and Social Appearance Anxiety Scale (SAAS) were used to compare acne, rosacea, and seborrheic dermatitis patients and healthy controls. The relationships between DLQI, HADS, and SAAS results were investigated, as well as their associations with disease duration and severity.

Results: The study included 166 acne patients, 134 rosacea patients, 120 seborrheic dermatitis patients, and 124 controls. The patient groups had significantly higher DLQI, HADS, and SAAS scores than the control group. Rosacea patients had the highest DLQI and SAAS scores, as well as the highest anxiety prevalence. Patients with seborrheic dermatitis had the highest rate of depression. The DLQI, HADS, and SAAS results were moderately correlated with each other, but their relationship with disease duration and severity was insignificant or weak at best.

Conclusions: Chronic facial dermatoses have a detrimental impact on mood and quality of life. Although patients with acne, rosacea, and seborrheic dermatitis have distinct lesions, the outcomes in terms of quality of life, anxiety, and depression are largely similar. Furthermore, these patients report similar levels of social anxiety as a result of their overall appearance.

Introduction

Healthy skin shields the organism from the outside. However, in its absence, a person becomes not only vulnerable to the physical environment but also suffers from psychological and social problems. While it is easier to conceal pathologies in certain areas, concealing the face is often more difficult. One's social, economic, and romantic opportunities are shaped by one's face. Thus, facial dermatoses may be more likely to have negative consequences.

Acne, rosacea, and seborrheic dermatitis are chronic skin diseases that primarily affect the face. Although each of these diseases is well known to be associated with poor quality of life, anxiety, and depression, no study has been conducted to compare the psychosocial burden of these diseases.

In this study, we examined acne, rosacea, or seborrheic dermatitis patients who presented to a dermatology outpatient clinic with facial complaints. We hoped to use the findings to better identify patients who might benefit from psychosocial support in addition to dermatological care, as well as to strengthen patient compliance. The patients' quality of life as well as the frequency and severity of anxiety and depression were compared. Also, the social anxiety caused by patients' overall appearances—which extended beyond their facial appearance—was compared.

Objectives

The purpose of this study was to compare the quality of life, anxiety, and depression levels in adult acne, rosacea, and seborrheic dermatitis patients and healthy controls. We also compared the social anxiety caused by overall appearance (rather than just the face) between these groups.

Methods

Study Design, Participants and Ethics

This cross-sectional study included patients between the ages of 18 and 65 who presented to the Duzce University Hospital Dermatology Clinic with acne, rosacea, or seborrheic dermatitis between October 2020 and July 2021. Patients who presented with more than one of these diagnoses, as well as patients with other facial dermatoses, scarring, or dysmorphia, were excluded from the study. Patients who were pregnant or breastfeeding, patients with comorbidities that could cause neurological or psychiatric symptoms, and those who had used central nervous system-influencing medications in the previous 6 months (including systemic isotretinoin) were all excluded from the study. Hospital employees were chosen as healthy controls.

The study protocol was reviewed and approved by the Duzce University Ethics Committee (07.09.2020–2020/199). All participants in the study provided written consent.

Sociodemographic and Clinical Characteristics

All participants' ages, genders, and BMIs, as well as the severity and duration of illness for patient groups, were recorded. Global acne grading system[1] for acne patients, rosacea clinical scorecard[2] for rosacea patients, and seborrheic dermatitis area severity index[3] for seborrheic dermatitis patients were used to assess the severity of illness, and only the scores obtained from the facial area were used.

The Dermatology Quality of Life Index (DQLI)

This scale, created by Finlay[4] and adapted by Ozturkcan[5], aims to measure and compare data across all skin diseases. Questions are answered based on the previous week. The higher the final score, the greater the decrease in quality of life. The outcomes are graded as follows:

0 – 1 no effect at all on patient's life
2 – 5 small effect on patient's life
6 – 10 moderate effect on patient's life
11 – 20 very large effect on patient's life
21 – 30 extremely large effect on patient's life

It is further divided into six subscales to determine the focus of the impact on quality of life:

Questions 1&2: Symptoms, feelings
Questions 3&4: Daily activities
Questions 5&6: Leisure
Question 7: Work/school
Questions 8&9: Personal relationships
Question 10: Treatment

The Hospital Anxiety and Depression Scale (HADS)

The hospital anxiety and depression scale was created to screen for the presence of anxiety and depression in patients with physical illnesses who presented to non-psychiatric clinics[6]. Half of the 14-question scale investigates anxiety, while the other half investigates depression. It is answered based on the previous week. In 1993, Aydemir et al. adapted it, and cut-off scores indicating the presence of anxiety and depression were determined[7]. An anxiety subscale score of 11 or higher indicates the presence of anxiety, whereas a depression subscale score of 8 or higher indicates the presence of depression[7]. The results also reflect the severity of anxiety and depression, allowing them to be used in comparisons or patient follow-up[6].

The Social Appearance Anxiety Scale (SAAS)

The social appearance anxiety scale was developed by Hart et al. in 2008[8] and later adapted by Dogan et al. in 2010[9]. It was created to assess fear in situations where the person's

overall external appearance can be evaluated. The appearance is assessed in a broader context, rather than focusing on a specific feature such as hair, nose, or chest size. Its primary purpose is to assess the components of social anxiety. The scale consists of 16 questions with no cut-off point. As the score rises, so does the person's anxiety about his or her appearance.

Statistics

Baseline demographic and clinical characteristics in acne, rosacea, seborrheic dermatitis, and control groups were described using mean (standard deviation), median (interquartile range), frequencies, and percentages. The Pearson chi-square test was used to compare the categorical variable (sex). The continuous variables (age, BMI, and duration of illness) were initially evaluated using the Kolmogorov-Smirnov test, and then compared using the Kruskal-Wallis test because they did not have a normal distribution. Pairwise comparisons were analyzed using the Mann-Whitney U test with Bonferroni correction.

The distribution of the DLQI, HADS, and SAAS results in the acne, rosacea, seborrheic dermatitis, and control groups was analyzed using the Kolmogorov-Smirnov test. Because the data did not have a normal distribution, the Kruskal-Wallis test was performed to compare the results. Pairwise comparisons were analyzed using the Mann-Whitney U test, with Bonferroni correction applied in cases where the difference was found to be significant. Furthermore, Quade's non-parametric analysis of covariance (ANCOVA) was employed to account for differences in baseline demographic factors, including age, gender, and BMI. Scheffe's method was employed as a post-hoc test. Categorical variables were evaluated using Pearson's chi-square, Fisher's exact test, or Fisher-Freeman-Halton test, depending on the expected value principle. Pearson or Spearman correlation analysis was used to examine correlations between continuous variables, depending on the distribution of the data.

An ordinal logistic regression model was designed to analyze the relationship between acne, rosacea, seborrheic dermatitis, control groups, and DLQI outcomes using the previously described five outcome grades of the scale. For SAAS, an ordinal logistic regression model was also created, and the final scale score was employed as the response variable. The binary logistic regression models for anxiety and depression subscales were created using the previously defined cut-off values. The healthy controls served as the reference group. Age, gender, and BMI were included as covariates in all regression models, and the results were reported as adjusted odds ratios with 95% confidence intervals. The SPSS 26.00 package program was used to analyze the data. Statistical significance was defined as .05 or less.

Results

Participants

The study enrolled 166 acne, 134 rosacea, and 120 seborrheic dermatitis patients, along with 124 healthy volunteers. Rosacea patients had the highest mean age, BMI, and longest duration of illness. Acne patients had the lowest mean age and BMI of any group. The majority of patients with acne and rosacea were female, while the majority of patients with seborrheic dermatitis were male (Table 1).

Table 1. The baseline demographic and clinical features of the participants.

		Acne	Rosacea	Seborrheic Dermatitis	Control	p
n (%)		166 (30.5)	134 (24.6)	120 (22.1)	124 (22.8)	—
Age[1]	Mean (SD)	22.8 (5.3)	37.9 (12.9)	31.9 (12.2)	31.7 (11.1)	< .001*
	Median (IQR)	21.5 (6)	36 (22)	28 (13)	27.5 (15)	
	[Min.–Max.]	[18 – 55]	[18 – 65]	[18 – 65]	[20 – 65]	
Sex, n (%)	Male	51 (30.7)	29 (21.6)	89 (74.2)	64 (51.6)	< .001**
	Female	115 (69.3)	105 (78.4)	31 (25.8)	60 (48.4)	
BMI[1]	Mean (SD)	22.3 (3.4)	28.8 (6.1)	25.3 (4.7)	24.8 (4.5)	< .001*
	Median (IQR)	21.6 (4)	28 (7.5)	24.6 (6.1)	24.4 (6.6)	
	[Min.–Max.]	[16 – 40.4]	[17.5 – 53.1]	[15.4 – 39.4]	[16.4 – 41.5]	
Duration of Illness[2]**, Years** **Mean (SD)** **Median (IQR)** **[Min. – Max.]**		 4.7 (4.1) 4 (4.5) [0 – 20]	 8.4 (9.5) 5 (10) [0 – 40]	 4.9 (6.5) 3 (5) [0 – 50]	 0 0 0	.003*

**Kruskal-Wallis test*
***Pearson Chi-square*
Pairwise comparisons are significant at p <.05 for:
[1] *Acne vs. Rosacea, Seborrheic dermatitis, Control; Rosacea vs. Seborrheic dermatitis, Control*
[2] *Acne vs. Rosacea; Rosacea vs. Seborrheic dermatitis*

The Dermatology Life Quality Index

Acne, rosacea, and seborrheic dermatitis patients (p <.001) had a significantly lower quality of life than the control group when the results were interpreted as grades (Figure 1). The negative impact on quality of life was similar across acne, rosacea and seborrheic dermatitis patients.

Acne patients had a higher mean and median score than seborrheic dermatitis patients and a lower mean and median score than rosacea patients [DLQI, mean (SD) = acne: 5.5 (5.1); rosacea: 6.3 (5.8); seborrheic dermatitis: 4.3 (4); control: 1.3 (1.8)]. The only statistically significant difference after adjusting for age, gender, and BMI was found in pairwise comparisons between the patient groups and the healthy controls (Table 2).

Acne patients had higher average scores on the "symptoms and feelings" and "treatment" subscales, whereas rosacea patients had higher impairment in "daily activities," "leisure," "work and school," and "personal relationships." But the only significant result was obtained when comparing patients with rosacea and seborrheic dermatitis on the subscale concerning daily activities (mean (SD): rosacea: 1.13 (1.6) – seborrheic dermatitis: .48 (.92); p = .002).

Ordinal logistic regression was performed to evaluate the likelihood of being in a higher DLQI grade in acne, rosacea, and seborrheic dermatitis patients, with healthy controls serving as the reference group. Age, gender, and BMI were identified as confounders and were adjusted for. The logistic regression model was statistically significant [$\chi^2(6)$ = 134.513, p <.001]. The adjusted odds ratio for acne patients was 8.78 (95% CI 5.24–14.72, p <.001), for rosacea patients was 13.04 (95% CI 7.44–22.86, p <.001), and for the seborrheic dermatitis patients was 8.17 (95% CI 4.80–13.88, p <.001).

The Hospital Anxiety and Depression Scale

HADS results suggested the presence of anxiety in 30 (18.1%) acne patients, 50 (37.3%) rosacea patients, 31 (25.8%) seborrheic dermatitis patients, and 10 (8.1%) subjects from the control group (Table 3). Using the previously reported cut-off points in the HADS, a binary logistic regression model was used to investigate the relationship between the acne, rosacea, seborrheic dermatitis, and control groups, and the presence of anxiety. Age, gender, and BMI were identified as confounders and were adjusted for. The healthy controls served as the reference group. The logistic regression model was statistically significant [$\chi^2(6)$ = 37.542, p <.001]. The presence of anxiety was associated with an adjusted odds ratio of 2.59 (95% CI 1.18–5.69, p =.017) in acne patients, 5.90 (95% CI 2.73–12.73, p <.001) in rosacea patients, and 4.01 (95% CI 1.84–8.73, p <.001) in seborrheic dermatitis patients.

In terms of anxiety severity, patients with rosacea scored the highest, with a mean of 8.49 (4.7). Seborrheic dermatitis patients had a mean of 7.92 (4.19), acne patients had a mean of 7.32 (3.99), and the control group had a mean of 5.73 (3.52). After controlling for age, gender, and BMI, we discovered that

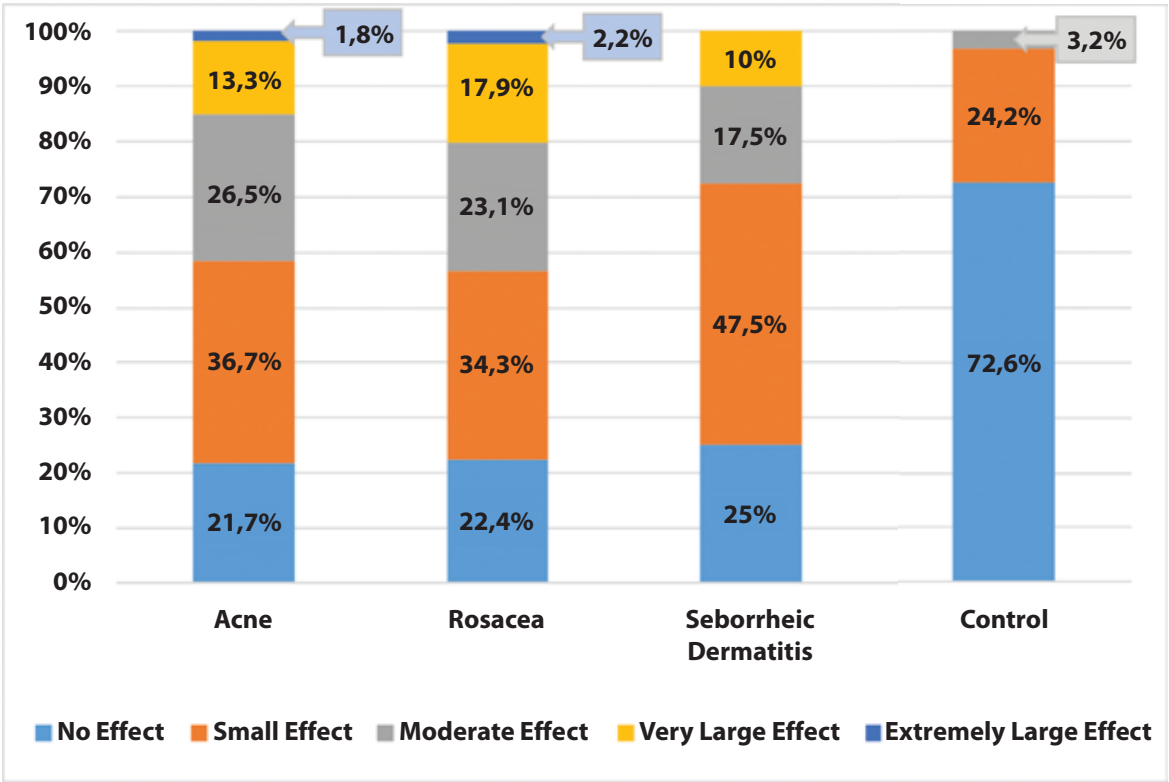

Figure 1. The negative impact of skin disease on quality of life.

Table 2. Comparison of dermatology life quality index (DLQI) scores by group.

	Acne	Rosacea	Seborrheic Dermatitis	Control
Median (IQR)	4 (5)	5 (7)	3 (5)	1 (2)
[Min.-Max.]	[0-26]	[0-27]	[0-16]	[0-10]
Mean (SD)	5.5 (5.1)	6.3 (5.8)	4.3 (4)	1.3 (1.8)
SEM	.399	.501	.372	.165
p*	< .001	< .001	< .001	Ref.

p value for Kruskal-Wallis test < .001
** Mann-Whitney U test.*
After controlling for age, gender, and BMI, pairwise comparisons are significant (p <.05) for: Acne vs. Control; Rosacea vs. Control; Seborrheic dermatitis vs. Control.

Table 3. Comparison of the frequency and severity of anxiety and depression by group.

	Acne	Rosacea	Seborrheic Dermatitis	Control	p
Participants, n (%)	166 (30.5)	134 (24.6)	120 (22.1)	124 (22.8)	
Anxiety					
Yes, n (%)	30 (18.1)	50 (37.3)	31 (25.8)	10 (8.1)	< .001*
Median (IQR) [Min.- Max.]	7 (5) [0-19]	9 (7) [0-19]	7 (6) [0-19]	6 (4) [0-20]	< .001**
Mean (SD)	7.32 (3.99)	8.49 (4.7)	7.92 (4.19)	5.73 (3.52)	
SEM	.31	.407	.382	.317	
Depression					
Yes, n (%)	46 (27.7)	51 (39.5)	49 (41.5)	19 (16.1)	< .001*
Median (IQR) [Min.- Max.]	5 (5) [1 – 18]	6 (5) [0 – 19]	6 (6) [0 – 14]	4 (4) [0 – 14]	< .001**
Mean (SD)	5.66 (3.54)	6.51 (3.73)	6.31 (3.62)	4.59 (2.89)	
SEM	.275	.323	.331	.260	

** Pearson Chi-square*
** Kruskal-Wallis test
After controlling for age, gender, and BMI, pairwise comparisons are significant (p <.05) for:
Anxiety: Acne vs. Control; Rosacea vs. Control; Seborrheic dermatitis vs. Control.
Depression: Acne vs. Control; Rosacea vs. Control; Seborrheic dermatitis vs. Control

patients with acne, rosacea, and seborrheic dermatitis experienced more severe anxiety than healthy controls, but there was no significant difference across the patient groups (Table 3).

The depression subscale suggested the presence of depression in 46 (27.7%) of the acne patients, 51 (39.5%) of the rosacea patients, 49 (41.5%) of the seborrheic dermatitis patients, and 19 (16.1%) of the control group (Table 3). To examine the association between the acne, rosacea, seborrheic dermatitis, and control groups and the presence of depression, a binary logistic regression model was created using the depression cut-off points in the HADS. Age, gender, and BMI were identified as confounders and were adjusted for. The healthy controls served as the reference group. The logistic regression model was statistically significant [$\chi^2(6) = 25.227$, p <.001]. The presence of depression was associated with an adjusted odds ratio of 2.16 (95% CI 1.15–4.04, p =.016) in acne patients, 3.35 (95% CI 1.76–6.37, p <.001) in rosacea patients, and 3.53 (95% CI 1.89–6.59, p <.001) in seborrheic dermatitis patients.

In terms of depression severity, rosacea patients received the highest scores, with a mean of 6.51 (3.73). This was followed by seborrheic dermatitis with a mean of 6.31 (3.62), acne with a mean of 5.66 (3.54), and the control group with a mean of 4.59 (2.89). After controlling for age, gender, and BMI, it was found that acne, rosacea, and seborrheic dermatitis patients experienced more severe depression than healthy controls, but there was no significant difference between the patient groups (Table 3).

The Social Appearance Anxiety Scale

According to the results of the SAAS, rosacea patients had the highest mean score of 38.51 (16.37). Acne patients had a mean of 36.86 (14.24), seborrheic dermatitis patients had a mean of 33.83 (13.67), and the control group had a mean of

26.37 (8.4). In paired comparisons, acne, rosacea, and seborrheic dermatitis patients' scores were significantly higher than the control group after controlling for age, gender, and BMI. The pairwise comparisons of the patient groups revealed no significant differences (Table 4).

An ordinal logistic regression model was created to explore the relationship between the acne, rosacea, seborrheic dermatitis, and control groups and the SAAS results. Age, gender, and BMI were identified as confounders and were adjusted for. The healthy controls served as the reference group. The logistic regression model was statistically significant [$\chi^2(6) = 54.586$, $p < .001$]. The adjusted odds ratio for receiving a higher score on the scale was 3.14 (95% CI 2.05–4.81, $p < .001$) for acne patients, 4.05 (95% CI 2.54–6.48, $p < .001$) for rosacea patients, and 2.46 (95% CI 1.57–3.83, $p < .001$) for seborrheic dermatitis patients.

Correlations

There was a positive relationship between disease severity and the DLQI, HADS, and SAAS scores in acne and rosacea patients. Similarly, a positive relationship was found between disease severity and the DLQI and SAAS scores in patients with seborrheic dermatitis. These associations were found to be significant but weak, with the strongest link being found between the severity of seborrheic dermatitis and the DLQI results [r (120) =.446, p =.000]. There was no significant relationship between illness duration and DLQI, HADS, or SAAS outcomes in the patient groups (Table 5).

In all patient groups, the DLQI, HADS, and SAAS outcomes had significant and positive correlations with each other (Table 6). The strongest correlation was seen between the HADS anxiety and depression subscales, which were moderately correlated with each other. There was also a moderate association between the DLQI and the SAAS outcomes in acne patients [r (166) =.659, p =.000].

Discussion

Acne, rosacea, and seborrheic dermatitis patients' quality of life was found to be significantly lower when compared to healthy people. These patients reported having more negative feelings about themselves as a result of their skin illnesses, and they had more difficulty with their daily and leisure time activities, work and school lives, and personal relationships.

Table 4. Comparison of social appearance anxiety scale (SAAS) scores between groups.

	Acne	Rosacea	Seborrheic Dermatitis	Control
Median (IQR)	35 (22)	35 (26)	32 (23)	24 (12)
[Min.-Max.]	[16 – 75]	[16 – 79]	[16 – 67]	[16 – 50]
Mean (SD)	36.86 (14.24)	38.51 (16.37)	33.83 (13.67)	26.37 (8.4)
SEM	1.106	1.414	1.249	.754
p*	< .001	< .001	< .001	Ref.

p value for Kruskal-Wallis test < .001
* Mann-Whitney U test.
After controlling for age, gender, and BMI, pairwise comparisons are significant (p <.05) for:
Acne vs. Control; Rosacea vs. Control; Seborrheic dermatitis vs. Control.

Table 5. The correlations between severity and duration of illness with the dermatology quality of life index, anxiety and depression scores, and the social appearance anxiety scale in patient groups.

	DLQI	Anxiety Subscale	Depression Subscale	SAAS
	r	r	r	r
Severity of Illness				
Acne	**.271****	**.172***	**.206***	**.241***
Rosacea	**.354****	**.290****	**.272***	**.308****
Seborrheic Dermatitis	**.446****	.173	.198	.262*
Duration of Illness				
Acne	-.022	.071	-.002	-.007
Rosacea	-.144	-.108	-.122	.003
Seborrheic Dermatitis	-.053	.018	-.036	.070

DLQI: Dermatology Life Quality Index, SAAS: Social Appearance Anxiety Scale, r: Correlation coefficient.
** significant at p < .05*
*** significant at p < .001*

Table 6. Correlations of the dermatology quality of life index, anxiety and depression scores, and the social appearance anxiety scale by groups.

	DLQI and Anxiety Subscale	DLQI and Depression Subscale	DLQI and SAAS	Anxiety and Depression Subscales	Anxiety Subscale and SAAS	Depression Subscale and SAAS
	r	r	r	r	r	r
Acne	.468**	.473**	.659**	.564**	.413**	.339**
Rosacea	.354**	.338**	.487**	.671**	.400**	.437**
Seborrheic Dermatitis	.275*	.182*	.401**	.593**	.304**	.374**
Control	.255*	.204*	.154	.330**	.333**	.039

DLQI: Dermatology Life Quality Index, SAAS: Social Appearance Anxiety Scale, r: Correlation coefficient.
** significant at p < .05*
*** significant at p < .001*

Furthermore, anxiety and depression were both more common and severe in these individuals. They experienced more intense social anxiety as a result of their beliefs that their appearance would be judged negatively, and the source of this anxiety extended beyond the facial area to overall negative body image thoughts (not being attractive, being overweight, hair color, nose shape, body shape).

Rosacea patients had the most negative impact on their quality of life, followed by acne and seborrheic dermatitis patients, respectively. There was also a statistically significant difference between rosacea and seborrheic dermatitis patients. This difference, however, was eliminated after controlling for age, sex, and BMI. Similarly, the severity of social anxiety caused by overall appearance was highest in rosacea patients, second in acne patients, and third in seborrheic dermatitis patients, but the differences were not statistically significant.

A study comparing acne and seborrheic dermatitis found that acne patients had a higher rate and severity of anxiety and depression[10]. A study in Lithuania comparing acne and rosacea patients aged 18-70 found that acne patients had higher anxiety and rosacea patients had higher depression[11]. The fact that these studies were completed with a smaller number of patients is a limitation. Our study included a larger number of participants, comparing patients with acne, rosacea, and seborrheic dermatitis simultaneously. According to our data, anxiety rates were highest in rosacea patients, followed by seborrheic dermatitis and acne patients, respectively. Depression rates were highest in patients with seborrheic dermatitis, followed by rosacea and acne patients, respectively. The severity of anxiety and depression, on the other hand, was comparable in acne, rosacea, and seborrheic dermatitis patients after controlling for age, sex, and BMI.

Rosacea patients' physical symptoms, such as burning, stinging, redness, and flushing, may explain why the negative impact on quality of life is greater. Common rosacea triggers such as the sun, weather, stress, emotional state, and various foods may cause patients to develop an avoidance behavior, either consciously or unconsciously. Patients may refrain from participating in outdoor activities to avoid being exposed to triggers such as the sun, hot or cold air, wind, and social gatherings to avoid emotional triggers. This can result in introversion, social isolation, depression, and anxiety. A lack of sunlight is linked to an increased risk of depression[12,13]. Anxiety and other psychological stressors contribute to this cycle by exacerbating rosacea symptoms through the release of proinflammatory cytokines[14].

Another intriguing finding is the high rate of depression in seborrheic dermatitis patients. Seborrheic dermatitis is frequently linked to neurological conditions such as Parkinson's disease[15,16], tardive dyskinesia[17], or spinal damage[18]. There is also a link between seborrheic dermatitis and psychiatric illnesses. According to the literature, those with mood disorders are more likely to develop seborrheic dermatitis[19], and those with seborrheic dermatitis are more likely to develop depression[20]. Parkinson's disease is characterized by a decrease in dopamine, and dopamine receptor blockage results in tardive dyskinesia. Recently, the importance of dopamine has been emphasized in addition to serotonin and noradrenaline in the pathophysiology of depression[21]. Although our study was observational in nature and was not intended to establish a cause-effect relationship, it is worth noting that seborrheic dermatitis is frequently seen in conjunction with diseases in which dopamine plays a prominent role in the pathophysiology.

Our findings show that the severity of psychosocial impact in patients with acne, rosacea, and seborrheic dermatitis is unrelated to the duration or severity of symptoms. The literature shows that even when different measurement methods are used, the results are similar. Acne[22,23], rosacea[24,25], and seborrheic dermatitis[26] severity and duration have been reported to be insignificant or significant but

weakly related to psychosocial outcomes. This suggests that patients with a new-onset or mild disease may be severely impacted. On the other hand, despite having a severe or long-term disease, some patients can maintain their mental health. This implies that what matters is not the biological process itself, but the meaning ascribed to one's own illness.

Another intriguing aspect is the correlation between the DLQI, HAD, and SAAS results. The negative effects observed by these scales are significantly related to each other in all patient groups, with anxiety and depression having the most pronounced relationship. Mental symptoms caused by a physical illness, particularly chronic diseases, can lead to other mental problems and loss of function over time. Yazici et al. used the same measurement methods in their study on acne patients and found results that were similar to ours in terms of the relationship between quality of life and anxiety and depression[27].

Because of the nature of observational studies, cause-and-effect relationships cannot be established, and results may differ across cultures, time periods, or measurement methods. Furthermore, some selection bias is unavoidable, particularly when recruiting the control group. Therefore, we concentrated mostly on comparing patient groups to one another. The patient groups are made up of those who sought treatment, and it is reasonable to assume that those who have been severely impacted by the negative psychological and social consequences will seek treatment more frequently. As a result, those who have the disease but lack the motivation to seek treatment might be underrepresented in the study. Therefore, we can speculate that if similar studies were conducted with a general population sample, the psychosocial impact on the subjects would be less severe.

Acne, rosacea, and seborrheic dermatitis lead to a number of psychosocial consequences, but also vice versa. Sebocytes, which play a key role in the pathogenesis of acne, have functional receptors for molecules involved in the stress response, such as CRH, melanocortin, beta-endorphin, vasoactive intestinal polypeptide, neuropeptide Y, and calcitonin gene-related peptide[28]. It has been established that stress-induced reactive oxygen derivatives, antimicrobial peptides, and neuropeptides cause inflammation by activating various cytokine and chemokine networks in the formation of rosacea's characteristic histopathology[29]. Observational studies have shown that patients with seborrheic dermatitis have more frequent and severe attacks during stressful times[30,31]. Breaking the disease-stress cycle in both steps may improve treatment outcomes.

A thorough skin examination should be complemented by a brief assessment of the patient's mental state. Chronic skin diseases impose a significant psychosocial burden, which may be exacerbated if they are visible to others. Stress is not only a symptom of illness; it is also one of its causes, and it can lead to suicidal ideation during vulnerable times in one's life. Identifying vulnerable patients and breaking the disease-stress cycle in both steps might improve patient compliance and treatment efficacy.

References

1. Doshi A, Zaheer A, Stiller MJ. A comparison of current acne grading systems and proposal of a novel system. *Int J Dermatol*. 1997;36(6):416-418. doi:10.1046/j.1365-4362.1997.00099.x
2. Wilkin J, Dahl M, Detmar M, et al. Standard grading system for rosacea: report of the National Rosacea Society Expert Committee on the classification and staging of rosacea. *J Am Acad Dermatol*. 2004;50(6):907-912. doi:10.1016/j.jaad.2004.01.048
3. Baysal V, Yildirim M, Ozcanli C, Ceyhan AM. Itraconazole in the treatment of seborrheic dermatitis: a new treatment modality. *Int J Dermatol*. 2004;43(1):63-66. doi:10.1111/j.1365-4632.2004.02123.x
4. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)--a simple practical measure for routine clinical use. *Clin Exp Dermatol*. 1994;19(3):210-216. doi:10.1111/j.1365-2230.1994.tb01167.x
5. Oztürkcan S, Ermertcan AT, Eser E, Sahin MT. Cross validation of the Turkish version of dermatology life quality index. *Int J Dermatol*. 2006;45(11):1300-1307. doi:10.1111/j.1365-4632.2006.02881.x
6. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361-370. doi:10.1111/j.1600-0447.1983.tb09716.x
7. Aydemir Ö, Güvenir T, Küey L, Kültür S. Hastane Anksiyete ve Depresyon Ölçeği Türkçe Formunun Geçerlilik ve Güvenilirlik Çalışması. Reliability and Validity of the Turkish version of Hospital Anxiety and Depression Scale. *Türk Psikiyatr Derg*. 1997;8(4):280-287. https://www.researchgate.net/publication/301778685_Hastane_Anksiyete_ve_Depresyon_Olcegi_Turkce_Formunun_Gecerlilik_ve_Guvenilirlik_Calismasi_Reliability_and_Validity_of_the_Turkish_version_of_Hospital_Anxiety_and_Depression_Scale
8. Hart TA, Flora DB, Palyo SA, Fresco DM, Holle C, Heimberg RG. Development and examination of the social appearance anxiety scale. *Assessment*. 2008;15(1):48-59. doi:10.1177/1073191107306673
9. Doğan T. Sosyal Görünüş Kaygısı Ölçeği'nin (SGKÖ) Türkçe Uyarlaması: Geçerlik ve Güvenirlik Çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Derg*. 2010;(39):151-159.
10. Pärna E, Aluoja A, Kingo K. Quality of life and emotional state in chronic skin disease. *Acta Derm Venereol*. 2015;95(3):312-316. doi:10.2340/00015555-1920
11. Lukaviciute L, Ganceviciene R, Navickas P, Navickas A, Grigaitiene J, Zouboulis CC. Anxiety, Depression, and Suicidal Ideation amongst Patients with Facial Dermatoses (Acne, Rosacea, Perioral Dermatitis, and Folliculitis) in Lithuania. *Dermatology*. 2020;236(4):314-322. doi:10.1159/000506627
12. Kim SY, Bang M, Wee JH, et al. Short- and long-term exposure to air pollution and lack of sunlight are associated with an increased risk of depression: A nested case-control

study using meteorological data and national sample cohort data. *Sci Total Environ*. 2021;757(2):143960. doi:10.1016/j.scitotenv.2020.143960
13. O'Hare C, O'Sullivan V, Flood S, Kenny RA. Seasonal and meteorological associations with depressive symptoms in older adults: A geo-epidemiological study. *J Affect Disord*. 2016;191:172-179. doi:10.1016/j.jad.2015.11.029
14. Oussedik E, Bourcier M, Tan J. Psychosocial Burden and Other Impacts of Rosacea on Patients' Quality of Life. *Dermatol Clin*. 2018;36(2):103-113. doi:10.1016/j.det.2017.11.005
15. Mastrolonardo M, Diaferio A, Logroscino G. Seborrheic dermatitis, increased sebum excretion, and Parkinson's disease: a survey of (im)possible links. *Med Hypotheses*. 2003;60(6):907-911. doi:10.1016/s0306-9877(03)00094-x
16. Barbeau A. Dopamine and disease. *Can Med Assoc J*. 1970;103(8):824-832. http://www.ncbi.nlm.nih.gov/pubmed/4248929
17. Sandyk R. Melanocyte-stimulating hormone and persistent tardive dyskinesia: a hypothesis. *Int J Neurosci*. 1990;51(1-2):45-52. doi:10.3109/00207459009000507
18. REED WB, PIDGEON J, BECKER SW. Patients with spinal cord injury. Clinical cutaneous studies. *Arch Dermatol*. 1961;83:379-385. doi:10.1001/archderm.1961.01580090029002
19. Maietta G, Fornaro P, Rongioletti F, Rebora A. *Patients with Mood Depression Have a High Prevalence of Seborrhoeic Dermatitis*. Vol 70.; 1990. doi:10.2340/0001555570432434
20. Oztas P, Calikoglu E, Cetin I. Psychiatric tests in seborrhoeic dermatitis. *Acta Derm Venereol*. 2005;85(1):68-69. doi:10.1080/00015550410021574
21. Dunlop BW, Nemeroff CB. The role of dopamine in the pathophysiology of depression. *Arch Gen Psychiatry*. 2007;64(3):327-337. doi:10.1001/archpsyc.64.3.327
22. Bhate K, Williams HC. Epidemiology of acne vulgaris. *Br J Dermatol*. 2013;168(3):474-485. doi:10.1111/bjd.12149
23. Sood S, Jafferany M, Vinaya Kumar S. Depression, psychiatric comorbidities, and psychosocial implications associated with acne vulgaris. *J Cosmet Dermatol*. 2020;19(12):3177-3182. doi:10.1111/jocd.13753
24. Haber R, El Gemayel M. Comorbidities in rosacea: A systematic review and update. *J Am Acad Dermatol*. 2018;78(4):786-792.e8. doi:10.1016/j.jaad.2017.09.016
25. Wu Y, Fu C, Zhang W, Li C, Zhang J. The dermatology life quality index (DLQI) and the hospital anxiety and depression (HADS) in Chinese rosacea patients. *Psychol Health Med*. 2018;23(4):369-374. doi:10.1080/13548506.2017.1361540
26. Cömert A, Akbaş B, Kılıç EZ, et al. Psychiatric comorbidities and alexithymia in patients with seborrheic dermatitis: a questionnaire study in Turkey. *Am J Clin Dermatol*. 2013;14(4):335-342. doi:10.1007/s40257-013-0019-7
27. Yazici K, Baz K, Yazici AE, et al. Disease-specific quality of life is associated with anxiety and depression in patients with acne. *J Eur Acad Dermatol Venereol*. 2004;18(4):435-439. doi:10.1111/j.1468-3083.2004.00946.x
28. Zouboulis CC, Böhm M. Neuroendocrine regulation of sebocytes – a pathogenetic link between stress and acne. *Exp Dermatol*. 2004;13 Suppl 4(4):31-35. doi:10.1111/j.1600-0625.2004.00254.x
29. Gerber PA, Buhren BA, Steinhoff M, Homey B. Rosacea: The cytokine and chemokine network. *J Investig Dermatology Symp Proc*. 2011;15(1):40-47. doi:10.1038/jidsymp.2011.9
30. Peyrí J, Lleonart M, Grupo español del Estudio SEBDERM. [Clinical and therapeutic profile and quality of life of patients with seborrheic dermatitis]. *Actas Dermosifiliogr*. 2007;98(7):476-482. doi:10.1016/s1578-2190(07)70491-2
31. Misery L, Touboul S, Vinçot C, et al. [Stress and seborrheic dermatitis]. *Ann Dermatol Venereol*. 2007;134(11):833-837. doi:10.1016/s0151-9638(07)92826-4