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Atopic dermatitis in adolescents: assessment of quality of life, anxiety, and depression levels

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Abstract
The current study evaluated the quality of life, anxiety, and depression in adolescents diagnosed with atopic dermatitis. Adolescents diagnosed with atopic dermatitis (AD) (n = 25) who were not receiving regular treatment were compared with 41 healthy adolescents. Disease severity in adolescents with AD was evaluated using the Scoring Atopic Dermatitis (SCORAD) index and the Children's Dermatology Life Quality Index (CDLQI). In both groups, depression and anxiety were assessed using the Beck Depression and Anxiety Scales. Results indicated that quality of life was severely affected (Median = 16.0, AD group). The mean anxiety and depression scores were 34.0 and 16.0, respectively, in the AD group, and 35.0 and 11.0, respectively, in the control group. Pruritus severity was significantly correlated with both anxiety ($r = 0.524$, $p = 0.01$) and depression ($r = 0.472$, $p = 0.02$). Quality of life decreased in adolescents with AD, while signs and symptoms of anxiety and depression were more prevalent. The results also revealed a significant relationship between pruritus severity and psychological burden. These findings suggest that it is important to evaluate patients with AD using a holistic approach, not solely based on dermatological assessment but in concert with psychosocial needs.

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Introduction

Atopic dermatitis (AD) is a chronic, recurrent, and pruritic skin disease.[1] Different factors, such as disruption of the epithelial skin barrier, genetics, and environmental influences, play a role in its pathophysiology.[1] AD is known to affect approximately 5% of the global population.[2] Although it typically begins in early childhood and is thought to decrease in frequency with age, recent prevalence studies indicate a marked upward trend in the prevalence of AD among adolescents over the past decade.[3]

In AD, not only physical involvement but also psychosocial impact is present. Studies have shown that children and adolescents with AD have a lower quality of life compared to the general population and that stress, behavioral problems, sleep disturbances, and psychiatric conditions such as anxiety and depression are more prevalent among them.[4-9] Depression is more frequently observed in patients with AD and is also thought to exacerbate the disease.[10,11] However, the association between allergic diseases and depression-anxiety, as well as the underlying mechanisms, has been inadequately investigated. Moreover, studies specifically examining the impact of atopic dermatitis on quality of life and its psychological burden in adolescents remain quite limited.

This study aims to assess the quality of life, levels of anxiety and depression in adolescents diagnosed with AD.

Materials and Method

This study is a comparative, cross-sectional study with two groups. The patient group consisted of 25 adolescents aged 13–18 years diagnosed with AD based on the Hanifin and Rajka criteria[12] who were not receiving any regular treatment for AD and who presented to the Pediatric Allergy and Immunology Outpatient Clinics of Prof. Dr. Cemil Tascioglu City Hospital. The control group consisted of 41 healthy adolescents who presented to the General Pediatrics Outpatient Clinic of the same hospital.

Inclusion criteria: AD patients aged 13–18 years who agreed to participate in the study, patients not receiving regular treatment, and healthy individuals of the same age group who agreed to participate in the study as the control group.

Exclusion criteria: AD patients receiving regular treatment and individuals declining to participate in the study.

Clinical and demographic data

The age and sex of all participants were recorded, and for adolescents with AD, the duration of atopic dermatitis, history of accompanying atopic diseases, family history of atopy, peripheral blood eosinophil count, and total IgE levels were documented.

Assessment of disease severity and pruritus

The disease severity of individuals with AD was evaluated using the SCORAD index, as recommended by The European Task Force on Atopic Dermatitis.[13] In the SCORAD index, a score is calculated based on the extent of the lesions, the intensity of the symptoms, and other subjective complaints. Scores lower than 15 indicate mild AD, scores between 15–40 indicate moderate disease, and scores higher than 40 indicate severe disease.[13]

Additionally, the Peak Numeric Rating Scale was used to assess pruritus severity.[14] The participants were asked to grade the intensity of their itch between 0 (no pruritus) and 10 (worst imaginable pruritus).

Assessment of quality of life

The Dermatology Life Quality Index (DLQI) is a scale developed to assess the impact of dermatological diseases on individuals' quality of life.[15] The Children's Dermatology Life Quality Index (CDLQI), developed in 1995, is a 10-item scale designed to assess the impact of dermatological diseases in children aged 4–14 years, and its Turkish version has established validity and reliability.[16,17]

The items in the scale are designed to evaluate the effects of the disease during the past week, covering domains such as symptoms, emotions, daily activities, leisure time, school/work life, relationships, and treatment processes. Each item has four possible response options, and the total score reflects the overall level of impact of the disease on quality of life. The items are rated on a scale from 0 to 3, with total scores ranging from 0 to 30. The interpretation of scores is as follows:

- 0 points: indicates no effect on quality of life,
- 7–12 points: indicates a moderate impact,
- 13–30 points: indicates a severe impact on quality of life.

In our study, the CDLQI was used to assess quality of life. In addition, to ensure consistency and measurement uniformity, the CDLQI was administered instead of the DLQI to six adolescent patients aged 16–17 years. According to the literature, DLQI and CDLQI scores have been reported to show a high level of correlation in this age group.[18]

Assessment of anxiety and depression

The depression levels of the participants were assessed using the Beck Depression Inventory, while their anxiety levels were evaluated using the Beck Anxiety Inventory.

The depression levels of the patients were assessed using the Beck Depression Inventory, a 21-item instrument with established validity and reliability in Turkish.[19,20] Each item consists of self-evaluation statements with four choices. Each item is scored from 0 to 3, with the total score ranging between 0 and 63. According to the total score, 0–9 indicates minimal, 10–16 mild, 17–29 moderate, and 30–63 severe depression.

The anxiety levels of the patients were assessed using the Beck Anxiety Inventory (BAI), a 21-item instrument with established validity and reliability in Turkish.[21,22] Each item is scored from 0 (not at all) to 3 (severely–nearly unbearable). Increasing total scores indicate greater levels of anxiety experienced by participants. According to the

total scores, 8–15 indicates mild anxiety, 16–25 moderate anxiety, and 26–63 severe anxiety.

Ethical committee approval

Approval was obtained from the local, noninvasive Clinical Research Ethics Committee (date: July 30, 2025; document no: E-48670771-514,99-283508126), and written informed consent was obtained from the parent or legal guardian of each study participant. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Statistics

In the descriptive analysis of the data, mean, standard deviation, median, minimum, maximum, frequency, and percentage values were used. The distribution of the variables was assessed using the Kolmogorov–Smirnov and Shapiro-Wilk tests. Independent quantitative variables with normal distribution were analyzed using the independent-samples t-test. For the analysis of independent quantitative variables without normal distribution, the Kruskal–Wallis and Mann–Whitney U tests were used. Categorical variables, such as sex and anxiety level, were analyzed using the chi-square test. Correlation analysis was conducted using Spearman correlation analysis. All analyses were conducted using the SPSS 28.0 software.

Results

A total of 66 adolescents aged 13–18 years (mean 15.2 ± 1.4 years) participated in this study, comprising 25 with atopic dermatitis (AD) and 41 healthy controls. The age and sex distribution of the groups is presented in Table 1.

Atopic dermatitis group characteristics

Among patients with AD, 76% had at least one accompanying atopic condition, most commonly allergic rhinitis (60%), followed by asthma (16%) and food allergy (4%). A family history of atopy was present in 64% of cases. The mean disease duration was 30 months (range: 1–204 months). Disease severity distribution based on SCORAD scoring showed that 48% had mild AD, 44% had moderate AD, and 8% had severe AD. The mean pruritus severity score was 7.0 (6.8 ± 2.0) on the visual analog scale. Laboratory findings revealed a mean peripheral blood eosinophil count of 410/mm^3 (497.4 ± 444.8), with eosinophilia detected in nine patients. The mean total IgE level was 434.8 IU/mL (533.2 ± 492.8). The clinical and laboratory characteristics of the AD group are presented in Table 2.

Psychological measures and quality of life

The Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) were administered to both groups. In the AD group, the mean anxiety score was 34.0, and the mean depression score was 16.0. In the control group, the mean anxiety score was 35.0, and the mean depression score was 11.0. The distribution of anxiety and depression severity levels in both groups is presented in Table 3.

The Children's Dermatology Life Quality Index (CDLQI) was administered exclusively to the AD group, and the mean score was found to be 18.0 (16.6 ± 3.2) (Table 3).

Between-group comparisons and correlations

When the AD and control groups were compared, no statistically significant differences were observed in mean BAI scores, anxiety severity distributions, mean BDI scores, or depression severity distributions (all $p > 0.05$; Table 3). However, within the AD group, female patients had significantly higher mean BAI scores compared to male patients ($p < 0.05$; Table 4).

No significant associations were found between anxiety or depression scores and the following variables: presence of accompanying atopic diseases, family history of atopy, disease severity assessed by SCORAD, sex (for depression scores), age, disease duration, total IgE levels, and peripheral blood eosinophil count (all $p > 0.05$; Tables 4–5).

In the AD group, significant positive correlations were identified between pruritus severity and both anxiety ($r = 0.524$, $p = 0.007$) and depression scores ($r = 0.472$, $p = 0.017$). Additionally, impairment in quality of life (CDLQI scores) was positively correlated with both anxiety and depression scores ($p < 0.05$; Table 6).

Discussion

Even though atopic dermatitis is mostly a skin condition with childhood onset, it can also emerge during adolescence or adulthood.[23,24] However, studies focusing on the adolescent period remain limited. In this study, the association of atopic dermatitis with anxiety and depression levels during adolescence, as well as its impact on quality of life, was investigated.

Table 1 Demographic Characteristics of Study Participants.

Characteristics	AD Group (n=25)	Control Group (n=41)
Age (years), median (IQR)	15.25 (14.0-15.75)	15.25 (14.0-16.58)
Male sex, n (%)	11 (44.0)	18 (43.9)
Female sex, n (%)	14 (56.0)	23 (56.1)

AD: Atopic dermatitis; IQR: Interquartile range.

Table 2 Clinical and Laboratory Characteristics of Patients with Atopic Dermatitis (n=25).

Characteristics	n (%)	Median (IQR)
Accompanying allergic disease		
Allergic rhinitis	15 (60.0)	-
Asthma	4 (16.0)	-
Food allergy	1 (4.0)	-
Family history of atopy	16 (64.0)	-
Duration of AD (months)	-	30.0 (12.0-72.0)
SCORAD severity		
Mild	12 (48.0)	-
Moderate	11 (44.0)	-
Severe	2 (8.0)	-
Total IgE (IU/mL)	-	434.8 (76.3-913.5)
Eosinophil count (cells/mm^3)	-	410.0 (195.0-630.0)
Visual pruritus score	-	7.0 (6.0-8.0)

SCORAD: SCORing Atopic Dermatitis; IgE: Immunoglobulin E; IQR: Interquartile range.

Table 3 Comparison of Anxiety, Depression, and Quality of Life Measures Between the AD and Control Groups.

Variables	AD group (n=25) median (IQR)	Control group (n=41) median (IQR)	P value	t-Z-x2
CDLQI score	18.0 (14.0-19.0)	-		
Beck Anxiety Score	34.0 (29.25-45.5)	35.0 (29.25-45.5)	0.709*	-0.374
Beck Depression Score	16.0 (7.0-20.75)	11.0 (7.0-20.75)	0.213*	-1.245
Anxiety severity, n (%)			0.521†	0.412
Mild	3 (12.0)	3 (7.3)		
Moderate	21 (84.0)	37 (90.2)		
Severe	1 (4.0)	1 (2.4)		
Depression severity, n (%)			0.264†	1.248
Minimal	7 (28.0)	19 (46.3)		
Mild	6 (24.0)	8 (19.5)		
Moderate	11 (44.0)	11 (26.8)		
Severe	1 (4.0)	3 (7.3)		

AD: Atopic dermatitis; IQR: Interquartile range; CDLQI: Children's Dermatology Life Quality Index.
*Mann-Whitney U test; †Chi-square test.

Table 4 Factors Associated with Anxiety Scores in Patients with Atopic Dermatitis

Variables	n	Beck anxiety score median (IQR)	P value*	Z-H
Sex			0.032	-2.148
Male	11	34.0 (21.0-46.0)		
Female	14	34.5 (28.0-70.0)		
Accompanying atopy			0.549	-0.599
Absent	9	34.5 (21.0-58.0)		
Present	16	34.0 (21.0-70.0)		
Family history of atopy			0.477	-0.711
Absent	9	31.0 (21.0-70.0)		
Present	16	35.0 (21.0-47.0)		
SCORAD severity			0.261	2.685
Mild	12	31.0 (21.0-70.0)		
Moderate	11	34.0 (28.0-58.0)		
Severe	2	41.0 (36.0-46.0)		

SCORAD: SCORing Atopic Dermatitis; IQR: Interquartile range.
*Mann-Whitney U test for binary variables; Kruskal-Wallis test for SCORAD severity.

Table 5 Factors Associated with Depression Scores in Patients with Atopic Dermatitis.

Variables	n	Beck depression score median (IQR)	P value*	Z-H
Sex			0.210	-1.254
Male	11	13.0 (0.0-28.0)		
Female	14	21.0 (1.0-33.0)		
Accompanying atopy			0.210	-1.255
Absent	9	20.5 (0.0-33.0)		
Present	16	15.0 (1.0-28.0)		
Family history of atopy			0.433	-0.784
Absent	9	21.0 (0.0-33.0)		
Present	16	15.5 (4.0-28.0)		
SCORAD severity			0.229	2.950
Mild	12	12.5 (0.0-22.0)		
Moderate	11	21.0 (1.0-33.0)		
Severe	2	18.5 (17.0-20.0)		

SCORAD: SCORing Atopic Dermatitis; IQR: Interquartile range.
*Mann-Whitney U test for binary variables; Kruskal-Wallis test for SCORAD severity.

Table 6 Correlations Between Psychological Scores and Clinical Variables in Patients with Atopic Dermatitis.

Variables	Beck Anxiety Scorer	P value	Beck Depression Scorer	P value
Age	0.124	0.555	0.154	0.463
AD duration	−0.166	0.428	−0.152	0.468
Visual pruritus score	0.524	0.007	0.472	0.017
Total IgE	0.012	0.956	0.019	0.932
Eosinophil count	−0.090	0.682	0.244	0.262
CDLQI score	0.575	0.003	0.440	0.028

AD: Atopic dermatitis; IgE: Immunoglobulin E; CDLQI: Children's Dermatology Life Quality Index
Spearman correlation coefficient (r) was used

Previous studies have demonstrated that the quality of life of adolescents with AD is moderately affected.[25] When examining the relationship between AD severity and quality of life, some studies have reported a deterioration in quality of life as disease severity increases, whereas another study indicated that quality of life is impaired only in moderate AD and remains unaffected in severe cases.[25-34] However, contrary to existing studies, no association between SCORAD scores and anxiety and depression was observed in our sample. This may be attributed to most patients having mild or moderate AD, as well as the limited sample size. Nevertheless, the number of studies specifically focusing on the adolescent population remains limited.

According to WHO data, anxiety disorders are observed in 4.4% of children aged 10–14 years and 5.5% of adolescents aged 15–19 years, while the prevalence of depression is reported as 1.4% and 3.5%, respectively.[35] In our study, however, the rates of depression were found to be higher in both the patient and control groups. This discrepancy may be attributed not only to socioeconomic and cultural differences but also to the use of self-reported symptom assessments, which tend to yield higher prevalence rates compared to diagnostic criteria. At the same time, consistent with previous studies, this study also demonstrated that anxiety levels of female adolescents were significantly higher compared to male adolescents.

Although there was no statistically significant difference between anxiety and depression scores of the AD and control groups, the fact that 84% of AD patients had moderate anxiety and 44% had moderate depression symptoms demonstrates the importance of psychological monitoring of this patient group. This finding is consistent with the existing literature indicating a positive association between AD and the prevalence of depression and anxiety.[36-39]

Our study revealed no significant association between AD duration and levels of depression and anxiety, as also reported by previous studies in the literature.[39-41] However, a direct association has been reported between the severity of pruritus, one of the most distressing symptoms of AD, and depressive symptoms.[42,43]

Eosinophilia was detected in nine patients in our study, while the mean total IgE level was found to be 434.8 IU/mL. However, no significant association was found between these parameters and depression or anxiety. Although it has been reported that individuals with IgE level > 100 IU/mL have a lower capacity to cope with stress, the relationship between eosinophil levels and the severity of

emotional symptoms has not yet been clarified.[44]Long-term follow-up studies demonstrate that the risk of depression and anxiety increases significantly toward 18 years of age in children with an AD diagnosis.[45] Similarly, another study describes the rising prevalence of depression during adolescence.[46] These findings highlight the need for monitoring adolescents with AD in this regard.

Strengths and limitations

This study is important as it examines the disease burden of adolescents with atopic dermatitis in terms of quality of life and psychological impact; however, it has several limitations. First, due to the relatively low prevalence of AD during adolescence, the sample size was limited, which restricts the generalizability of the findings. In addition, the participants included in the study were not receiving regular treatment, which prevented the evaluation of the impact of treatment on quality of life and psychological symptoms.

Moreover, the psychiatric assessments used in this study are not clinical diagnoses made by a child and adolescent psychiatrist; they only reflect symptom levels through self-report scales. Although self-report forms are commonly used in psychiatric evaluations, it should be remembered that the most accurate clinical assessment can be made by psychiatrists, and referrals should be made when necessary.

Furthermore, the study design is cross-sectional. Therefore, changes in psychological symptoms during the course of the disease were not observed. The relationship between the improvement of lesions with treatment and psychological well-being could also not be evaluated. Future studies with a longitudinal design will demonstrate the long-run psychiatric effects of AD more successfully.

Conclusions

This study reveals that quality of life significantly deteriorates in individuals who are diagnosed with AD during adolescence and that these individuals experience anxiety and depression symptoms more frequently. A significant association was observed between pruritus severity and psychological symptoms. The findings support that patients with AD in this age group should not be evaluated only from a dermatological perspective but also from a psychosocial and mental health perspective. During clinical follow-up, the routine use of tools to evaluate quality of life and emotional burden is important in terms of early intervention and support. Additionally, the psychiatric effects of AD can be demonstrated more clearly in future studies with larger sample sizes and longitudinal designs.

Mandatory Disclosure on Use of Artificial Intelligence

The authors declare that no AI-assisted tools were used in the preparation of this manuscript. All references have been manually verified for accuracy and relevance.

Author Contributions

All authors contributed equally to this article.

Conflict of Interest

The authors declare no conflict of interest.

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