

## Frequency and severity of Anxiety in patients with Atopic Dermatitis referred to dermatology clinic of 22 Bahman Hospital in Mashhad

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### Abstract

Atopic dermatitis is a chronic and irritating skin disease that causes psychiatric disorders, so it is necessary to know the factors affecting the incidence of this disease. The aim of this study was to investigate the frequency and severity of anxiety in patients with atopic dermatitis. This cross-sectional analytical study was performed on 76 patients with atopic dermatitis referred to dermatology clinic of 12 Bahman Hospital in 2020. After recording demographic data and clinical notes, the anxiety scale was recorded using Hamilton questionnaire. The data were analyzed using SPSS 20 software and Chi-square and Fisher tests. The results showed that 38.2% of patients with atopic dermatitis had anxiety. Also, there was a significant relationship between age and anxiety ( $P < 0.05$ ). Due to the high prevalence of anxiety in patients with atopic dermatitis and the determinants of the risk of further anxiety, patients with higher risk atopic dermatitis should be properly screened and appropriate counseling and educational measures should be taken alongside standard treatment.

**Keywords:** Anxiety, Atopic dermatitis, Utopian dermatitis, Skin Clinic

## Introduction

Dermatitis or eczema is an inflammatory response of the skin to various factors and its clinical manifestations include pruritus, redness, scaling, and papulovesicular lesions. In summary, dermatitis is divided into exogenous and endogenous groups. Atopic dermatitis (AD) is one of the most important types of endogenous (1). The prevalence of atopic dermatitis is from 6% at age 26 to 34% at age 12 (2). The prevalence of atopic dermatitis in Iran is 3.9% (3). The cause of AD is deficiency in the skin barrier, mainly through the disruption of the filaggrin and changes in the innate and acquired immune system, including inflammatory cells and markers (4).

AD is associated with severe skin inflammation and itching and high rates of sleep disorders. It is associated with social stigma, increased health care costs, and a lower quality of life, and all of these may contribute to an increased incidence of depression (3). There are a number of potential theories that explain the cause of most AD patients with psychiatric illnesses; first, it is possible that changes in inflammatory markers play a role in the development of mental disorders; for example, this association could be seen in patients with psoriasis with hepatitis C treated with interferon because interferon exacerbates psoriasis symptoms and causes anxiety as a side effect. In addition, biologists in psoriasis block some of the inflammatory markers that are involved in depression and psoriasis, reducing the rate of depressive symptoms. It may be that much like what was found in psoriasis, a change in the cytokine profile in AD contributed to an increased risk of depression. Second, there is a link between sleep disorders and depression in the general population. A number of studies show that sleep disturbances are more common in atopic dermatitis are more likely to develop disorders and anxiety (7).

Nasri et al. conducted a study to compare stressors and coping styles in patients with skin

patients with AD as compared to non-atopic patients which may contribute to an increased risk of depression. Third, itching is one of the main symptoms of AD. Depression and even suicidal thoughts in AD have been found to be associated with itching, and an increase in the severity of itching is also associated with an increase in the severity of depression. By targeting the improvement of disorders in these three factors: inflammatory pathway, sleep disturbances and itching, depression can be reduced in patients with AD (5).

In a 2015 study by Cheng et al. in Tapia, Taiwan titled "Risk of Anxiety Disorders in Adolescents and Adults with Atopic Dermatitis: A Countrywide Study," 8,028 patients from Taiwan's National Insurance Database System, aged over 12 years, had no history of psychiatric illnesses of both sexes with age matching between 1998 and 2008. They were selected and enrolled in the study and were followed up in 2011. Subjects with anxiety disorder were identified during follow-up. During the study, patients with atopic dermatitis were found to have an anxiety disorder (risk ratio of 3.57%, 95%, confidence intervals (2.55-4.98). As a result, this study showed that atopic dermatitis in adolescence and adulthood can increase the risk of various anxiety disorders (6).

In a 2015 study conducted in New Delhi, India, titled "Gender Differences in Atopic Dermatitis Anxiety," 81 patients (36 men and 45 women) were randomly selected from a skin care clinic with informed consent. All patients underwent initial assessment of mental disorders. There was no significant difference in the mean age of men and women in all patients. In this study, the prevalence of depression and anxiety was 15% and 12%, respectively, which were significantly high. Also, the rate of anxiety and disorders was significantly higher in women than in men. As a result of this study, women with diseases and normal people in 2015. The type of research was causal comparative. The sample size was 100 patients and 100 normal people who were randomly selected. Data were collected

using Lazarus Coping Strategies Scale and Pickle Life Events Questionnaire. Multivariate analysis of variance (MANOVA) was used to test the hypotheses. The results showed that there was no difference between the two groups in terms of the frequency of stressors, but the patient group had a higher assessment of the severity of stress. Also, there was a significant difference in coping strategies only in positive reassessment between the two groups and the normal subjects obtained higher scores than the patient group in positive re-evaluation. There was no significant difference in other coping methods. Research findings can be used for planning in the field of mental health and treatment of patients with skin disorders (8).

A 2020 study was conducted by Yuchai et al., to investigate anxiety in patients with atopic dermatitis. They identified 526,808 adults with atopic eczema, of which 569,030 healthy people were matched and entered the study. Atopic eczema was associated with increased incidence of anxiety. The relationship between therapeutic response was less in patients with new anxiety. In the end, it was concluded that adults with atopic eczema were more likely to be depressed (9). Since few studies have been done in the orientation of the relationship between anxiety severity and AD, we decided to conduct the current study aiming to evaluate the prevalence and severity of anxiety in patients with atopic dermatitis.

## Methods

In this cross-sectional analytical study, 76 patients with atopic dermatitis referred to dermatology clinic of 12 Bahman Hospital in 2020, who were diagnosed by dermatologist, were evaluated. At the beginning, a checklist containing demographic information and Hamilton anxiety questionnaire questions was approved by the supervisor. Then, with the coordination of the 12th Bahman Hospital, we communicated with patients referred to the dermatology clinic of 22 Bahman Hospital who were diagnosed with atopic dermatitis and

explained the plan to them in full. After obtaining patients' consent, we included them in the study by providing checklist to patients. Inclusion criteria were: having reading and writing literacy and having age over 12 years. Exclusion criteria were reluctance to participant in the study, incomplete filling of the questionnaire and having a history of chronic depression and taking related medications according to the physician's diagnosis. During the study, patients' anxiety was assessed based on the Hamilton Anxiety Inventory developed and introduced by Max Hamilton in 1967. The questionnaire consisted of 14 cases, each of which was related to specific symptoms of anxiety. Each question had 5 scores, based on the severity of the symptoms from zero to 4. Zero indicates the absence of a sign and 4 indicates the severity of the sign. These symptoms included anxious mood, tension, fear, insomnia, difficulty concentrating, depressed mood, muscle tension, general physical condition, cardiovascular symptoms, respiratory symptoms, stomach-intestinal symptoms, symptoms of the genitourinary tract, other physical symptoms such as dry mouth or sweating, and behavior during interview. The maximum score of this test was 56 and the patients were analyzed based on the test score. Finally, the data were analyzed by SPSS software version 20 using Chi-square and Fisher tests.

## Hamilton Anxiety Inventory (HRSA)

Hamilton anxiety rating scale was developed by Max Hamilton in 1959 and was included in clinical scales to assess the severity of anxiety. The scale is semi-structured and is graded based on concurrent interviews with clients and parents and by the therapist or interviewer. The scale consists of 14 items, and each case is answered in relation to specific symptoms of anxiety in the 5-point Likert spectrum. The minimum and maximum score is 0 to 56. In the researches which have been done to calculate the validity and reliability of this scale, the correlation of this questionnaire was reported to be 0.60 with Beck questionnaire, 0.73 with SCL-90, and 0.77 with

clinical evaluation. . There is also a correlation of about 0.65 between the symptomatic anxiety and the level of anxious mood. The correlation between the depression mood convergence scale with this scale was 0.59 and 0.78 and the differential correlation of anxious mood with it was reported to be 0.25 and 0.60, and the correlation between Hamilton anxiety rating scale and Beck anxiety questionnaire was 0.51 (10). The reliability of this test by Abolghasemi through retest was 0.81 (11).

## Results

According to Table 1, the frequency of anxiety in patients under 40 years old was significantly higher than patients over 40 years old (68.9% vs. 29%,  $P=0.001$ ).

According to Table 2, the frequency of moderate and severe anxiety was significantly higher in patients younger than 40 years old ( $P=0.03$ ).

According to Table 3, the frequency of anxiety in female gender patients was significantly higher than that of male patients (66.7% vs. 37.8%) ( $P=0.012$ ).

According to Table 4, there was no significant difference in the frequency of anxiety in patients with atopic dermatitis based on education ( $P>0.05$ ).

According to Table 5, There was no significant difference in frequency of anxiety in patients with atopic dermatitis based on gender ( $P>0.05$ ).

According to Table 6, There was a significant relationship between age and anxiety ( $P<0.05$ ).

## Discussion

The aim of this study was to investigate the frequency and severity of anxiety in patients with atopic dermatitis in dermatology clinic of hospitals affiliated to Islamic Azad University of Mashhad in 2019. In this study 76 patients with atopic dermatitis were enrolled in the study. The average age of the subjects was  $38.11 \pm 14.07$  years, and of the 76 patients included in the study, 37 (48.6%) were male and 39 (51.3%) were female. The mean score of anxiety was

$18.67 \pm 9.3$ , so that 36 (47.4%) had no anxiety, 21 (27.6%) had mild anxiety, 11 (14.5%) had moderate anxiety and finally 8 (10.5%) had severe anxiety. The findings of our study showed that anxiety was associated with lower age, girl gender, and higher education, but after eliminating confounding factors, it was found that anxiety was correlated with age. The results of this study were consistent with the study of Dalgaard et al (2017) entitled "Dermatologists across Europe underestimate depression and anxiety". In this study, 3,635 patients with skin diseases from 13 European countries who had referred to outpatient clinics were examined first with the opinion of a dermatologist and then using the Hospital Anxiety Assessment Scale (HADS). In the study, dermatologists diagnosed depression and anxiety only 44 percent and 35.5 percent of the disorders (compared to the Hospital Anxiety Assessment Scale). As a result of this study, it was found that the majority of the disorders and anxiety of patients with skin diseases are not diagnosed by specialists and unfortunately the patient will suffer psychologically (12). The level of depression reported in the mentioned study was similar to our study, but the anxiety reported in the results of our study was more than the mentioned study. In a 2020 study by Yuchai et al., to investigate anxiety and depression in patients with atopic dermatitis. They identified 526,808 adults with atopic eczema, of which 569,030 were matched healthy and entered the study. Atopic eczema was associated with increased incidence of new depression and anxiety. The relationship between therapeutic response was less in patients with new anxiety. In the end, it was concluded that adults with atopic eczema were more anxious. Although the sample size in this study is much higher than our study, the results are similar to ours and show a significant increase in anxiety in patients with atopic dermatitis (9).

In a study conducted by Haj Heidari et al., the authors investigated the psychological damage of patients referred to dermatology clinics in Sari city, 2004. In this descriptive study, 404 dermatology patients were evaluated using a two-

**Table 1. Frequency of Anxiety in Patients with Atopic Dermatitis Based on Age**

| Anxiety             |                  | Negative | Positive | Total | Test Statistics | P-value                    |
|---------------------|------------------|----------|----------|-------|-----------------|----------------------------|
| Age                 |                  |          |          |       |                 |                            |
| 40 years and lower  | Number of people | 14       | 31       | 45    | 11.69           | 0.001<br>(Chi-square test) |
|                     | Percentage       | 31.1%    | 68.9%    | 100%  |                 |                            |
| Upper than 40 years | Number of people | 22       | 9        | 31    |                 |                            |
|                     | Percentage       | 71%      | 29.4%    | 100%  |                 |                            |
| Total               | Number of people | 36       | 40       | 76    |                 |                            |
|                     | Percentage       | 47.4%    | 52.6%    | 100%  |                 |                            |

**Table 2. Frequency of different severities of Anxiety in patients with atopic dermatitis based on age**

| Anxiety             |                  | Negative | Mild  | Medium | Severe | Total | Test Statistics | P-value                     |
|---------------------|------------------|----------|-------|--------|--------|-------|-----------------|-----------------------------|
| Age                 |                  |          |       |        |        |       |                 |                             |
| 40 years and lower  | Number of people | 14       | 14    | 10     | 7      | 45    | 13.58           | 0.03<br>(Fisher exact test) |
|                     | Percentage       | 31.1%    | 31.1% | 22.2%  | 15.6%  | 100%  |                 |                             |
| Upper than 40 years | Number of people | 22       | 7     | 1      | 1      | 31    |                 |                             |
|                     | Percentage       | 71%      | 22.6% | 3.2%   | 3.2%   | 100%  |                 |                             |
| Total               | Number of people | 36       | 21    | 11     | 8      | 76    |                 |                             |
|                     | Percentage       | 47.4%    | 27.6% | 14.5%  | 10.5%  | 100%  |                 |                             |

**Table 3. Frequency of Anxiety in Patients with Atopic Dermatitis Based on Sex**

| Anxiety |                  | Negative | Positive | Total | Test Statistics | P-value                    |
|---------|------------------|----------|----------|-------|-----------------|----------------------------|
| Gender  |                  |          |          |       |                 |                            |
| Male    | Number of people | 23       | 14       | 37    | 6.33            | 0.012<br>(Chi-square test) |
|         | Percentage       | 62.2%    | 37.8%    | 100%  |                 |                            |
| Female  | Number of people | 13       | 26       | 39    |                 |                            |
|         | Percentage       | 33.3%    | 66.7%    | 100%  |                 |                            |
| Total   | Number of people | 36       | 40       | 76    |                 |                            |
|         | Percentage       | 47.4%    | 52.26%   | 100%  |                 |                            |

**Table 4. Frequency of Anxiety in Patients with Atopic Dermatitis Based on Education**

| Anxiety           |                  | Negative | Positive | Total | Test Statistics | P-value                    |
|-------------------|------------------|----------|----------|-------|-----------------|----------------------------|
| Education         |                  |          |          |       |                 |                            |
| Diploma and lower | Number of people | 24       | 24       | 48    | 0.362           | 0.547<br>(Chi-square test) |
|                   | Percentage       | 50%      | 50%      | 100%  |                 |                            |
| Academic          | Number of people | 12       | 16       | 28    |                 |                            |
|                   | Percentage       | 42.9%    | 57.1%    | 100%  |                 |                            |
| Total             | Number of people | 36       | 40       | 76    |                 |                            |
|                   | Percentage       | 47.4%    | 52.6%    | 100%  |                 |                            |

part questionnaire (GHQ-28) and demographic-medical characteristics. Data were analyzed by SPSS software using descriptive statistics. The average age of the patients referred

to the clinic was 28.72 years, 39.4% of whom were suspected of having a mental disorder. The prevalence of mental disorders in the age group of 46-55 years (52.6%), women (41.2%), single

**Table 5. Frequency of different severities of Anxiety in patients with atopic dermatitis based on gender**

| Anxiety |                  | Negative | Mild  | Medium | Severe | Total | Test Statistics | P-value                      |
|---------|------------------|----------|-------|--------|--------|-------|-----------------|------------------------------|
| Gender  |                  |          |       |        |        |       |                 |                              |
| Male    | Number of people | 24       | 13    | 6      | 5      | 48    | 0.557           | 0.906<br>(Fisher exact test) |
|         | Percentage       | 50%      | 27.1% | 12.5%  | 10.4%  | 100%  |                 |                              |
| Female  | Number of people | 12       | 8     | 5      | 3      | 28    |                 |                              |
|         | Percentage       | 42.9%    | 28.6% | 17.9%  | 10.7%  | 100%  |                 |                              |
| Total   | Number of people | 36       | 21    | 11     | 8      | 76    |                 |                              |
|         | Percentage       | 47.4%    | 27.6% | 14.5%  | 10.5%  | 100%  |                 |                              |

**Table 6. Logistic regression analysis by removing confounders effect**

|           | B     | S.E.  | Wald   | df | Sig.  | Exp(B) |
|-----------|-------|-------|--------|----|-------|--------|
| Age       | 2.032 | 0.635 | 10.140 | 1  | 0.001 | 0.131  |
| gender    | 1.135 | 0.531 | 4.561  | 1  | 0.033 | 3.111  |
| Education | 0.950 | 0.648 | 2.147  | 1  | 0.143 | 0.387  |
| Constant  | 2.574 | 1.693 | 2.310  | 1  | 0.129 | 13.114 |

(40.8%), rural residents (46.2%), illiterate and undereducated (62.5%), unemployed (58.7%), samples with positive history of psychiatric diseases (65.8%) and with diffuse skin lesions (63.6%) were higher than other groups. Among skin diseases, acne (28.2%), skin pigmentation disorders (20%), androgenic alopecia (7.4%) and dermatitis (6.7%) were the most prevalent. Dermatitis patients (44.4%) had the most mental disorders, acne (43%) and skin pigmentation disorders (42%) were ranked next. There was a significant relationship between mental disorder and occupation, educational level and positive history of mental illness. Duration of skin disease, type of skin disease, and location of lesions were not associated with mental disorder. Suspected cases of mental disorders were higher in comparison with studies conducted on dermatology patients outside of Iran and also compared to studies on prevalence of psychiatric disorders and mental health status in people aged 15 and over in Iran. The results of this study further clarify the relationship between mental disorders and skin diseases and consider psychological factors in effective treatment of skin diseases for dermatologists (13). Although the design of this study is not similar to ours, the findings on the high prevalence of mental disorders especially in patients with dermatitis

are similar. Therefore, based on the findings of our study and this study, it can be concluded that although there are more severe skin disorders than atopic dermatitis, dermatitis has the highest risk of developing psychiatric disorder, which requires closer examination of other contributing factors in these patients to increase this disorder.

Another study by Rønstad et al. in 2018 aimed to investigate the association between anxiety in patients with atopic dermatitis. There was a significant relationship between atopic dermatitis and anxiety in adults. A positive association was found between atopic dermatitis in adults and suicidal thoughts. Only a few studies had examined the risk of complete suicide, but the majority showed a positive association between suicide and atopic dermatitis. In the end, it was concluded that when treating patients with atopic dermatitis, depression, anxiety and suicidal thoughts should be considered by physicians. Since improving atopic dermatitis appears to reduce these risks, this should be a priority (14). In our study, in people over 12 years of age, the risk of anxiety was high in patients. Although our study did not study the risk of suicide and suicidal ideation, an increase in mental health disorder also increased the incidence of suicide in individuals, which grants more detailed studies. The findings of our study showed that 52.6% had



anxiety and also found that the anxiety was correlated with lower age, girl sex and higher education, but after eliminating confounding factors, it was found that anxiety was only associated with age. Therefore, considering the high prevalence of anxiety and depression in patients with atopic dermatitis and determining the effective factors in further incidence of anxiety and depression, patients with higher risk atopic dermatitis should be properly screened and appropriate counseling and educational measures should be taken alongside standard treatment for patients to reduce the incidence of anxiety and its complications in patients. One of the limitations of the present study was the lack of sample size, so it is suggested to use a larger sample size in future studies to obtain better results.

## Conclusion

Due to the high prevalence of depression in patients with atopic dermatitis and determining the factors affecting the higher incidence of depression, patients with higher risk atopic dermatitis should be properly screened and appropriate counseling and educational measures should be taken alongside the standard treatment in order to reduce the incidence of depression and its complications in the patients.

## Ethical approval

This article is the result of a research project with the ethics committee code IAU.MSHD.REC.1398.113 under the support of the Research Vice-Chancellor of the Islamic Azad University of Mashhad.

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## Conflict of Interest

In this study, the authors declare no conflicts of interests.

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