

Evaluation of personality traits of patients with alopecia areata according to a five-factor model

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Background: Alopecia areata is one of the most common causes of hair loss. In this study, the personality traits and stress levels of patients with alopecia areata were assessed and compared with a control group based on the NEO Five-Factor Inventory (FFI) and Perceived Stress Scale (PSS) questionnaires.

Methods: This cross-sectional study was performed on 120 patients with alopecia areata and 120 healthy individuals as a control group from 2015 to 2017 in Mashhad, Iran. The control group was selected from the families of patients who did not have current involvement and no history of alopecia areata, matched by gender, mean age, and level of education. A dermatologist evaluated the severity score of alopecia in participants. The NEO FFI and PSS questionnaires were used to assess patients' personality aspects. SPSS v. 20 was used to analyze the data.

Results: The results of the NEO FFI questionnaire showed that statistically, the mean score of neuroticism in alopecia areata patients was significantly higher than in the control group ($P = 0.023$), but the extraversion and flexibility scores were significantly higher in the control group than in alopecia areata patients ($P = 0.026$ & 0.049 , respectively). The PSS questionnaire results showed that the mean stress score of alopecia areata patients was similar to the control group ($P = 0.12$).

Conclusion: Our results suggest that compared with healthy individuals, patients with alopecia areata have higher neuroticism scores and lower extraversion and flexibility scores on the NEO FFI.

Keywords: alopecia areata, neuroticism, stress, NEO FFI questionnaire, PSS questionnaire

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INTRODUCTION

Alopecia areata is one of the most common skin diseases, often manifesting itself in the form of oval or round patches without scarring ¹⁻³. It is a chronic inflammatory disease that affects the scalp hair follicles and sometimes the scalp, beard, eyebrows, nails, and eyelashes. Alopecia areata affects about one percent of the population by the

age of fifty, while sixty percent of the patients are affected before the age of twenty ^{1,2,4}.

Various factors are known as the etiology of alopecia areata. The disease's familial incidence has been observed in 25–30% of patients ⁵. Many studies have shown that immune system disorders affect alopecia areata by increasing the CD4/CD8 ratio ⁶. Hereditary and genetic factors also play an essential role in developing this disease through

the HLA class 2 subtype⁷. In recent studies, the role of several infectious factors in the incidence of the disease has been discussed⁵.

Psychological and psychiatric factors also play an essential role in alopecia areata. Some studies suggest that the simultaneous use of drug therapy and hypnosis could effectively treat patients⁸. Patients' stress, psychiatric, and personality disorders can be effective in the incidence of the disease⁹⁻¹². Also, certain personality traits such as alexithymia (difficulty in expressing emotions) can reduce a person's ability to encounter stressful situations¹³. It also increases the risk of alopecia areata, psoriasis, vitiligo, and chronic urticaria. Evidence suggests that most patients with alopecia areata have mental disorders, including anxiety, paranoia, and depression¹⁴. Patients with alopecia areata have more depression and anxiety, while they have more conflict in their daily relationships with others. They are usually hysterical and prone to hypochondriasis¹⁵. As a result, alopecia areata can be considered a psychosomatic disease⁸. Therefore, studying the effects of psychological factors on the severity of the disease is necessary. The present study examines patients' personality traits with alopecia areata and compares them with the control group.

PARTICIPANTS AND METHODS

This cross-sectional study was performed using an easy sampling method at the Dermatology Research Center and Psychiatric Department of Imam Reza Hospital, Mashhad, Iran, between 2015–2017. The present study was performed based on a research plan (No. 940705) and Ethics Committee's license (No. IR.MUMS.FM.REC.1394.410).

The sample size of each study group was determined based on a previous study⁸ according to the difference in the score of the neuroticism questionnaire and using the formula of comparing two ratios related to qualitative traits from two independent communities. Therefore, 240 participants, including 120 alopecia areata patients and 120 controls, were enrolled in the study. The control group was selected from the family members of patients who did not have a history of alopecia areata. The members of the control group were selected in such a way that the participants in the two groups were almost identical in terms

of gender, age, and level of education.

Study protocol

At first, a brief history of each patient was taken, a dermatologist performed their clinical examination, and their demographic information was recorded. Different study stages were described for eligible patients, and patients entered the study with informed consent. After enrolling the patients, information about their disease severity was calculated and recorded based on the SALT score (Severity of Alopecia Tool). The scalp was divided into four parts to calculate the disease severity. A dermatologist assessed and scored the total extent of involvement in these four areas from S0 (without hair loss) to S5 (complete hair loss).

In the present study, after examining patients' personality traits with the help of the five-factor model, the amount of stress and the personality traits of patients with alopecia areata were investigated in relationship with their disease. The following five characteristics were evaluated as "five major factors" in a person's personality¹⁶⁻¹⁸: 1- neuroticism, 2- extraversion, 3- openness empiricism, 4- agreeableness, and 5- conscientiousness.

The NEO Five Personality Traits Questionnaire is one of the newest questionnaires related to the evaluation of personality traits. This questionnaire has a short-form 60-item questionnaire called the NEO Five-Factor Inventory (FFI), which assesses a personality's five main factors. Answering this questionnaire does not take much time from patients, but it is enough to examine the patients' general personality information, and its scales are highly valid¹⁹. The Perceived Stress Scale (PSS) was used to assess stress.

After an initial explanation of how to respond to the NEO FFI and PSS questionnaires, these questionnaires were completed by all participants. These questionnaires have been translated into Persian, and their validity and reliability have been confirmed in the Iranian population. The NEO FFI consists of 60 parts to assess the individual's personality traits. Each of the five factors is evaluated with 12 questions, and each of the questions consists of 5 options rated from 0 to 4. The total score for each personality trait is obtained from all the questions related to that personality trait. The NEO FFI can detect various personality

traits, including neuroticism, extraversion, openness, agreeableness, and conscientiousness. Neuroticism includes stress, mood swings, and anxiety. Extraversion involves talkativeness, high energy, and high productivity. Openness includes personality traits such as broad interests, strong imagination, and insight. Agreeableness includes empathy, kindness, and affection, while conscientiousness includes organization, perfection, and the ability to make decisions¹⁹.

Inclusion criteria included active alopecia areata and age over 16 years. The exclusion criteria were a history of other autoimmune and skin diseases, lack of literacy, and cognitive problems that prevented conscious filling of the questionnaires. All participants were assured that all their information would be kept confidential. Participants could leave the study at any stage if they were not interested.

Statistical analysis

Quantitative variables were reported using mean and standard deviation, while qualitative data were reported using frequency and frequency percentages. The Independent t-test was used to compare quantitative data between the two groups, while the chi-squared or Fisher test was used to compare qualitative data. The relationship between quantitative variables was investigated using a correlation test. Data were analyzed using SPSS20 software, and $P < 0.05$ was considered significant.

RESULTS

The mean age of participants in the study was 31.37 ± 10.2 years. The frequency of women was

158 (65.8%), and the frequency of men was 82 (34.2%). According to Table 1, which shows the general characteristics of the study groups, there was no significant difference in age and gender between the control group and the alopecia areata patient group ($P = 0.58$ and 0.05 , respectively).

According to the NEO FFI questionnaire, the prevalence of neuroticism, extraversion, adaptability, flexibility, conscientiousness, and responsibility was similar between the groups ($P > 0.05$). The average scores of the two participating groups in terms of neuroticism, extraversion, adaptability, flexibility, conscientiousness, and responsibility are shown in Table 2. According to this table, the mean scores of neuroticism, extraversion, and flexibility dimensions in patients with alopecia areata and the healthy control group were significantly different ($P < 0.05$).

No significant difference was observed between women in the alopecia group and women in the control group when comparing the mean scores of different NEO FEI questionnaire criteria. On the other hand, the mean score of neuroticism in men with alopecia areata was significantly higher than the controls ($P = 0.017$). The mean flexibility score

Table 2. Comparison of the NEO Five-Factor Inventory parameter scores between the study groups

Parameter	Alopecia group n=120	Control group n=120	P-value*
Neuroticism	35.95 ± 6.6	34.02 ± 6.0	0.023
Extraversion	27.61 ± 3.7	28.80 ± 4.2	0.026
Agreeableness	36.7 ± 6.9	35.11 ± 3.5	0.19
Openness	37.95 ± 4.6	39.23 ± 5.0	0.049
Conscientiousness	44.29 ± 5.3	45.59 ± 5.1	0.072

*Independent t-test

Table 1. General characteristics of the participants in the study

Variable	Alopecia group n=120	Control group n=120	P-value
Age (years) Mean ± SD	9.8 ± 29.44	10.3 ± 33.31	0.003**
Gender (%) frequency			
Female	77 (64.2)	(67.5) 81	0.58*
Male	(35.8) 43	(32.5) 39	
Level of Education (%) frequency			
Primary	(9.0) 10	(10.4) 11	0.71*
Middle	13 (11.7)	(8.5) 9	
Diploma	58 (52.3)	(56.6) 60	
University education	(27.0) 30	(24.5) 26	

*Independent sample T-test was used to compare the two groups.

**Chi-square test was used to compare the two groups.

Abbreviations: n, number; SD, standard deviation

Table 3. Comparison of the Perceived Stress Scale scores between the two study groups

	Average	Standard deviation	P-value
Alopecia group	26.68	2.7	0.12
Control group	28.25	7.6	

*Independent t-test

Table 4. Frequency of hair loss in patients with alopecia areata based on the Severity of Alopecia Tool (SALT) score

Hair loss	Frequency	Percentage
S0 : No hair loss	2	1.7
S1: Hair loss <25%	29	24.2
S2: Hair loss of 25–49%	28	23.3
S3: Hair loss of 50–74%	18	15.0
S3: Hair loss of 75–99%	18	15.0
S5: 100% hair loss	25	20.8

in male alopecia areata patients was significantly lower than the control group ($P = 0.023$). There was no significant difference between the men in the alopecia group and the men in the control group in comparing the mean scores of other criteria of the NEO FEI questionnaire ($P > 0.05$).

The PSS questionnaire results are presented in Table 3. The stress score of alopecia areata patients was 26.68 ± 2.7 , and the control group stress score was 28.25 ± 6.7 ($P = 0.12$). In the study of perceived stress by gender, the PSS questionnaire score in women with alopecia was 26.74 ± 6.7 and in women in the control group was 25.91 ± 7.3 ($P = 0.46$). These values in men with alopecia areata and men in the control group were 26.58 ± 3.8 and 24.5 ± 1.00 , respectively, which was not statistically significant ($P = 0.09$). The mean SALT scores of alopecia areata patients are presented in Table 4, indicating the average hair loss of alopecia areata patients.

DISCUSSION

The present study suggests that compared with healthy individuals, patients with alopecia areata have higher neuroticism scores and lower extraversion and flexibility scores. None of the criteria of the NEO FFI questionnaire were significantly different between women in the two groups. However, male patients had higher neuroticism scores and lower flexibility scores than male controls. We found no significant correlation between NEO FFI questionnaire items and hair loss percentage. Also, there was no significant

difference between the PSS questionnaire's mean scores between alopecia areata patients and controls.

Various studies have been performed to examine different personality aspects of alopecia areata patients^{8,9,11,12,14,15,20-24}. In a study performed in 2017 by Kim *et al.*²³, 100 patients with alopecia areata and 100 healthy individuals were enrolled, and their personality traits were investigated using the NEO FFI questionnaire. The questionnaires' results were evaluated according to the prognostic factors in alopecia areata, including the age of onset, severity, nail involvement, and disease duration. The extraversion and adaptation scores were significantly higher in alopecia areata patients than in the control group. Also, patients' personalities were not associated with their prognostic factors. Furthermore, negative personalities such as antisocial behaviors, hysteria, and anxiety were not among the personality traits of alopecia areata patients.

Contrary to these results, the present study showed lower extraversion scores in alopecia areata patients than in healthy individuals. It also showed that flexibility in these patients is less than in healthy individuals. Flexible people may be psychologically much healthier or more developed. However, it should be noted that flexibility or inflexibility also depends on various factors, such as the social status of individuals.

A similar study²¹ examined patients' personalities with alopecia areata and compared them with other skin disorders. The researchers found no difference between patients with alopecia areata with any of the other skin disorders in the paranoid, squid, antisocial, impulsive, borderline, and hysteria personality traits, as well as in obsessive-compulsive disorder, anxiety, and related diseases.

The present study showed that patients with alopecia areata have more negative personality traits than healthy individuals, such as an introverted personality and less flexibility. Some other studies' findings align with our results²⁰. In 2012, Alfani *et al.*²⁰ compared the personality traits of 73 patients with alopecia areata and 73 healthy individuals. They found that the rates of depression, hysteria, anxiety, melancholy, and conflict with the environment were higher in patients with alopecia areata than in healthy individuals. However, the personality scores of people with alopecia were different from those of the participants in our

study, which is related to the difference in the sample size of the two studies and the use of two different tools to assess personality.

It has been shown that mental disorders such as phobia, depression, anxiety, paranoia, and mood disorders are more common in alopecia patients than ordinary people²⁵. Of course, it is not clear whether these people initially had anxiety and depression and subsequently developed alopecia or vice versa.

The present study results showed no significant difference between the stress levels of alopecia areata patients and the control group. There is disagreement about whether psychological factors play an essential role in the pathogenesis of alopecia areata, and the results of various studies have been contradictory. While some researchers^{24,26} found no evidence to indicate the role of psychological factors in the development or acceleration of alopecia areata, others²² observed serious psychological disorders in patients with alopecia, with only 7% of them having no mental disorders.

In this study, different characteristics of alopecia areata patients were compared with the control group. The large sample size is one of the strengths of this study. However, this study also had limitations. At first, the effect of confounding factors such as the duration of the disease and the age of onset was not considered. Secondly, due to the nature of cross-sectional studies, it was impossible to establish a causal relationship between stress and personality traits in patients with alopecia areata, which means that it is unclear whether the patients had the disease first and then suffered from personality disorders and stress or vice versa. It is suggested to perform more detailed studies and compare the stress and personality traits in alopecia areata patients with other skin patients and investigate the effect of disease duration, nail changes, and age of disease onset on patients' stress and personality traits.

CONCLUSION

Our study suggests that compared with healthy individuals, patients with alopecia areata have higher neuroticism scores and lower extraversion and flexibility scores on the NEO FFI. This means that alopecia patients are more likely to experience negative emotions such as fear, sadness,

embarrassment, anger, guilt, and hatred, which should be considered during treatment and referred to a psychiatrist if necessary. It also showed that stress in these patients is no different from the average population, and our study rejects the hypothesis that these patients are under higher environmental stress.

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Conflict of Interest: None declared.

REFERENCES

1. Bologna JL, Jorizzo JL, Rapini RP. *Dermatology*: Gulf Professional Publishing; 2012.
2. Edidiong CN K, Tsoukas MM, William D J, et al. *Andrews' diseases of the skin: clinical dermatology*. Philadelphia: Elsevier; 2012.
3. Rook A, Burns T. *Rook's textbook of dermatology*. Wiley-Blackwell; 2010.
4. Lu W, Shapiro J, Yu M, et al. Alopecia areata: pathogenesis and potential for therapy. *Expert Rev Mol Med*. 2006;8(14):1.
5. García-Hernández MJ, Rodríguez-Pichardo A, Camacho F. Multivariate analysis in alopecia areata: risk factors and validity of clinical forms. *Arch Dermatol*. 1999;135(8):998-9.
6. Shapiro J. Alopecia areata: update on therapy. *Dermatol Clin*. 1993;11(1):35-46.
7. Price VH, Colombe BW. Heritable factors distinguish two types of alopecia areata. *Dermatol Clin*. 1996;14(4):679-89.
8. Aghaei S, Saki N, Daneshmand E, et al. Prevalence of psychological disorders in patients with alopecia areata in comparison with normal subjects. *Int Sch Res Notices*. 2014;2014.
9. Brajac I, Tkalčić M, Dragojević DM, et al. Roles of stress, stress perception and trait-anxiety in the onset and course of alopecia areata. *J Dermatol*. 2003;30(12):871-8.
10. Dugas M, Le Heuzey M. Stress, détresse et pelade: Etude

- de 60 observations personnelles. *Acta Paedopsychiatrica: Int J Child Adolescent Psych.* 1983.
11. García-Hernández MJ, Ruiz-Doblado S, Rodríguez-Pichardo A, et al. Alopecia areata, stress and psychiatric disorders: a review. *J Dermatol.* 1999;26(10):625-32.
 12. Gupta MA, Gupta AK, Watteel G. Stress and alopecia areata: a psychodermatologic study. *Acta dermato-venereologica.* 1997;77(4):296.
 13. Willemsen R, Haentjens P, Roseeuw D, et al. Alexithymia in patients with alopecia areata: educational background much more important than traumatic events. *J Eur Acad Dermatol Venereol.* 2009;23(10):1141-6.
 14. Erfan G, Albayrak Y, Yanik ME, et al. Distinct temperament and character profiles in first onset vitiligo but not in alopecia areata. *J Dermatol.* 2014;41(8):709-15.
 15. Díaz-Atienza F, Gurpegui M. Environmental stress but not subjective distress in children or adolescents with alopecia areata. *J Psych Res.* 2011;71(2):102-7.
 16. Chu SY, Chen YJ, Tseng WC, et al. Psychiatric comorbidities in patients with alopecia areata in Taiwan: a case-control study. *Br J Dermatol.* 2012;166(3):525-31.
 17. Manolache L, Benea V. Stress in patients with alopecia areata and vitiligo. *J Eur Acad Dermatol Venereol.* 2007;21(7):921-8.
 18. Willemsen R, Vanderlinden J, Roseeuw D, et al. Increased history of childhood and lifetime traumatic events among adults with alopecia areata. *J Am Acad Dermatol.* 2009;60(3):388-93.
 19. Anisi J. Validity and reliability of NEO Five-Factor Inventory (NEO-FFI) on university students. *Int J Behav Sci.* 2012;5(4):351-5.
 20. Alfani S, Antinone V, Mozzetta A, et al. Psychological status of patients with alopecia areata. *Acta dermato-venereologica.* 2012;92(3):304-6.
 21. Carrizosa A, Estepa-Zabala B, Fernández-Abascal B, et al. Alopecia areata: a specific personality? *Int J Dermatol.* 2005;44(5):437-8.
 22. Greenberg S. Alopecia areata: a psychiatric survey. *AMA Arch Dermatol.* 1955;72(5):454-7.
 23. Kim J-M, Kim H-S, Ko H-C, et al. Analysis of personality trait in patients with alopecia areata. *Ann Dermatol.* 2017;29(6):815-6.
 24. Macalpine I. Is alopecia areata psychosomatic? A psychiatric study. *Br J Dermatol.* 1958;70(4):117-31.
 25. Ruiz-Doblado S, Carrizosa A, García-Hernández MJ. Alopecia areata: psychiatric comorbidity and adjustment to illness. *Int J Dermatol.* 2003;42(6):434-7.
 26. Van der Steen P, Boezeman J, Duller P, et al. Can alopecia areata be triggered by emotional stress? An uncontrolled evaluation of 178 patients with extensive hair loss. *Acta dermato-venereologica.* 1992;72(4):279-80.