Amaç: Alopecia Areata (AA) çeşitli psikiyatrik bozukluklarla ilişkilendirilen saç kaybı ile seyreden dermatolojik hastalıklardan biridir. Bu çalışmada patolojik anksiyete düzeylerinin alopecia areata ve sağlıklı kontrol grubunda farklı olup olmadığını araştırıldı. Gereç ve Yöntem: 63 AA tanılı hasta, 90 sağlıklı kontrol katılmcı çalışmaya dahil etmek ve çalışmada dışlanma kriterleri göz önünde alınarak çalışmaya alındı. Sosyodemografik ve klinik özelliklerin kaydedildiği veri formu ile Penn State Worry Questionnaire (PSWQ) Penn State Patolojik Anksiyete Ölçüğü tüm katılımcılara uygulandı. Bulgular: Cinsiyet dışında sosyodemografik özelliklerin benzer olduğu tespit edildi. AA grupta AA hastalığı olan aile öyküsü anlamlı derecede yüksek bulundu. AA grupta ortalama PSWQ 44.02 ± 11.59 idi, sağlıklı kontrol grubunda 39.71 ± 7.77 idi. AA grupta ortalama PSWQ skorlarının istatistiksel olarak anlamlı olarak yüksek olduğu tespit edildi (t=-3.27, p= 0.001). Tartışma: Bu çalışma AA ve sağlıklı kontrol grupları patolojik anksiyete açısından karşılaştırıldığı ilk çalışmadır. AA lı hastaların yaşam kalitelerinin arttırılmasında patolojik anksiyetenin araştırılması ve değerlendirilmesi önemlidir. Ayrıca PSWQ anksiyete bozuklakları geliştirebilecek hastaların saptanması ve tedavi edilmesi önemlidir.

Anahtar Kelimeler
Alopecia Areata; Anksiyete; Patolojik; Association

Özet
Amaç: Alopecia areata (AA) çeşitli psikiyatrik bozukluklarla ilişkilendirilen saç kaybı ile seyreden dermatolojik hastalıklardan biridir. Bu çalışmada patolojik anksiyete düzeylerinin alopecia areata ve sağlıklı kontrol grubunda farklı olup olmadığını araştırıldı. Gereç ve Yöntem: 63 AA tanılı hasta, 90 sağlıklı kontrol katılmcı çalışmaya dahil etmek ve çalışmada dışlanma kriterleri göz önünde alınarak çalışmaya alındı. Sosyodemografik ve klinik özelliklerin kaydedildiği veri formu ile Penn State Worry Questionnaire (PSWQ) Penn State Patolojik Anksiyete Ölçüğü tüm katılımcılara uygulandı. Bulgular: Cinsiyet dışında sosyodemografik özelliklerin benzer olduğu tespit edildi. AA grupta AA hastalığı olan aile öyküsü anlamlı derecede yüksek bulundu. AA grupta ortalama PSWQ 44.02 ± 11.59 idi, sağlıklı kontrol grubunda 39.71 ± 7.77 idi. AA grupta ortalama PSWQ skorlarının istatistiksel olarak anlamlı olarak yüksek olduğu tespit edildi (t=-3.27, p= 0.001). Tartışma: Bu çalışma AA ve sağlıklı kontrol grupları patolojik anksiyete açısından karşılaştırıldığı ilk çalışmadır. AA lı hastaların yaşam kalitelerinin arttırılmasında patolojik anksiyetenin araştırılması ve değerlendirilmesi önemlidir. Ayrıca PSWQ anksiyete bozuklakları geliştirebilecek hastaların saptanması ve tedavi edilmesi önemlidir.

Anahtar Kelimeler
Alopecia Areata; Anksiyete; Patolojik; Association

Abstract
Aim: Alopecia Areata (AA) is a type of hair loss that has been considered to have associations with various psychiatric disorders. In this study, we aimed to compare pathological worry levels between patients with AA and healthy controls (HC). Material and Method: Sixty-three patients with AA and 90 HCs were included in the present study after applying inclusion and exclusion criteria. The socio-demographic characteristics, some clinical characteristics, and the scores from the Penn State Worry Questionnaire (PSWQ) were compared between groups. Results: The demographic characteristics were found to be similar between groups except for gender. The family history of AA was significantly higher in the AA group. The mean score of PSWQ in the AA group was 44.02 ± 11.59, compared to 39.71 ± 7.77 in the HC group. The mean score of PSWQ was significantly higher in the AA group (t=-3.27, p= 0.001). Discussion: The present study is the first to compare pathological worry between patients with AA and HCs. We suggest that pathological worry should be more thoroughly investigated in patients with AA to improve their quality of life. Also, this can be an effective approach to targeting the patients who may develop anxiety disorder.

Keywords
Alopecia Areata; Worry; Pathological; Association
Introduction
Alopecia Areata (AA) is a type of hair loss that is commonly asymptomatic, well restricted, and does not cause scars [1]. AA can present in any part of the body that has hair follicles. The prevalence of AA has been estimated as 0.2% in the population, with a lifetime incidence of about 2.1%. AA usually develops during the second or fourth decades of life. However, it can be seen in all age groups, including the pediatric population [1,2]. The exact etiology of AA is still unclear; genetic, environmental and immunological factors are considered to have roles in the etiopathogenesis of AA [3,4,5]. In histopathology, T cell infiltration of hair follicles has been found. Because the exact mechanism of AA etiology is not precisely known, the treatment may simply be topical. If needed, systemic treatment can be administered.

Stress is considered to be the most common environmental factor contributing to AA; however, the results of studies seem to be conflicting [6,7,8,9,10]. Increased levels of anxiety, aggression, and depressive mood have been reported in patients with AA [11,12]. In an experimental animal study, the rats with AA were found to have distorted hypothalamic-pituitary-adrenal (HPA) axis response to stressful stimuli [13]. A comorbidity of psychiatric disorders as high as 74% was reported in one study; however, there has been not any study confirming this high psychiatric comorbidity specifically in patients with AA [14]. Studies that research personality traits in patients with AA have failed to find any distinct personality traits in patients with AA compared with healthy subjects [15,16]. Although there have been studies reporting increased anxiety levels in patients with AA, as mentioned above, there have been no studies that researched pathological worry in patients with AA. In the present study, we aimed to compare pathological worry between patients with AA and healthy controls (HC) and to investigate the associations between pathological worry and the demographic and clinical properties of patients with AA.

Material and Method
Participants and Procedure
The study was conducted in Çanakkale Onsekiz Mart University Faculty of Medicine, Department of Psychiatry and Dermatology from January 2015 to January 2016. The patients admitted to the dermatology clinic and diagnosed with AA were included in the study. The inclusion criteria were as follows: diagnosed with AA, aged 18-60, willingness to participate in the study. The exclusion criteria were: younger than 18 or older than 60, diagnosed with a dermatological disease other than AA, having a current or previous psychiatric disorder, not willing to participate in the study. After applying the inclusion and exclusion criteria, 63 patients were enrolled in the study. Additionally, 90 HCs were enrolled in the study. All patients and HCs gave informed consent to be included in the study. The study was approved by the Çanakkale Onsekiz Mart University Faculty of Medicine ethical committee. Both patients and HC were assessed using the Penn State Worry Questionnaire and a form inquiring about demographic and clinical characteristics.

Instruments
Penn State Worry Questionnaire (PSWQ)
The Penn State Worry Questionnaire (PSWQ) measures pathological worries with excessive, chronic, and uncontrollable features. It is a 16-item self-report measure consisting of statements about worry (e.g., "Once I start worrying, I can't stop"), each with a 5-point answer scale ranging from 1 (not at all typical of me) to 5 (very typical of me). The total score ranges from 16 to 80, with higher scores indicating greater worry levels. The scale was created by Meyer et al. [17] and it has been reported to be valid and reliable in the Turkish language [18].

Statistical Analysis
The data obtained was evaluated by the Statistical Package for the Social Sciences-PC version 18.0 (SPSS, IBM, New York). A confidence interval (CI) of 95% and a 2-tailed P value less than 0.05 were considered to be statistically significant. All numerical variables were tested by the Kolmogorov-Smirnov test for normality of distribution. Levene’s test was used for homogeneity of variance of variables. The categorical variables such as gender, marital status, and family history of psychiatric disorders and AA were compared by χ2 test. The numerical variables such as age, duration of education, and PSWQ score were noted as mean ± SD and differences were compared with T test. The clinical characteristics of the AA group such as percentage of affected area, pattern of hair loss, involvement of body hair, involvement of nail, existence of remission, numbers of attacks, and existence of nevus flammeus were presented as percentages whereas age of onset of AA, the duration of AA, and number of attacks were noted as mean ± SD. A linear regression model was constructed between the PSWQ score and mean age, mean year of education, duration of AA, and age of onset of AA.

Results
The total numbers of participants was 153. There were 63 (40.9%) patients with AA and 90 (59.1%) HCs. The mean age of participants was 29.09 ± 9.71 years. 69 participants were female (44.5%) and 84 were male (55.5%). The mean years of education of participants was 9.88 ± 4.08 years. A family history of psychiatric disorders was present in 14 participants (9.1%), while 139 participants had no family history of psychiatric disorders (90.9%). 13 participants had a family history of AA (8.4%) and 153 participants did not (91.6%). 17 patients had 0% hair loss (27%), 34 patients had 25% hair loss (54%), 8 patients had 26-49% hair loss (12.7%), 3 patients had 50-74% hair loss (4.8%), and 1 patient had 75-99% hair loss (1.6%). 15 patients did not have a specific pattern of hair loss (23.8%), while the pattern was patch in 36 patients (57.1%), ophiasis in 4 patients (6.3%), and patch plus ophiasis...
in 8 patients (12.7%). The body hair involvement was absent in 30 patients (47.6%), while 22 patients had beard involvement (34.9), 7 patients had eyebrow involvement (11.1%), 1 patient had beard plus eyebrow involvement (1.6%), and 3 patients had involvement of other body parts (4.8%). There was ear involvement in 4 patients (6.3%) and no ear involvement in 59 patients (93.7%). 43 patients had experienced no remission of AA (68.3%) and 20 patients had experienced remission of AA (31.7%). The mean duration of AA was 5.01 ± 2.26 years and the mean age of onset of AA was 34.21 ± 8.92 years.

The numbers of females were 19 (30.2 %) and 50 (55.6%) in the AA and HC groups, respectively. 44 (69.8%) of the AA group and 40 (54.6%) of HC group were male. There was a significant difference in terms of gender (x²=9.56, p= 0.002). The mean age was 30.01 ± 10.66 years in the AA group and 28.46 ± 11.59 in the HC group. The mean age was similar between the AA and HC groups (t=-0.96, p= 0.33). The mean duration of education was 9.33 ± 5.52 years and 10.01 ± 4.47 in the AA and HC groups, respectively. The mean duration of education was found to be similar between groups (t=1.36, p= 0.29). Eight patients (12.7%) and 6 HCs (6.7%) had a family history of psychiatric disorder. The ratio of family history of psychiatric disorders was similar between groups (x²=1.62, p= 0.16). Twelve patients had a family history of AA (19.00%) and HC was a family history of AA. The family history of AA was significantly different between groups ( p<0.001). The mean PSWA score in the AA group was 44.02 ± 11.59, while it was 39.71 ± 7.77 in the HC group. The mean PSWA score was significantly higher in the AA group (t=-3.27, p= 0.001) (Table 1).

A regression analysis was performed to identify associations between mean PSWQ score and mean age, mean year of education, duration of AA, and age of onset of AA. There was not a significant association between mean PSWQ score and mean age, mean year of education, duration of AA, or age of onset of AA (respectively, un-standardized β= 0.203 ± 0.312, p=0.51; un-standardized β= -0.600 ± 0.292, p=0.06; un-standardized β= 0.264 ± 0.321, p=0.85, un-standardized β= -0.122± 0.319, p=0.70) (Table 2).

### Table 1. Sociodemographic and clinical characteristics of participants, AA: Alopecia Areata, HC: Healthy controls, PSWS: Penn State Worry Questionnaire, Significant P values predicted in bold character.

|                      | AA (N=63) | HC (N=90) | Statistic |
|----------------------|-----------|-----------|-----------|
| Age (years)          | 30.01 ± 10.66 | 28.46 ± 11.59 | t=0.96, p= 0.33 |
| Gender               |           |           |           |
| Female               | 19 (30.2 %) | 50 (55.6%) | X²=9.56, p= 0.002 |
| Male                 | 44 (69.8%) | 40 (54.6%) |           |
| Education (years)    | 9.33 ± 5.52 | 10.01 ± 4.47 | t=1.36, p= 0.29 |
| Family History of Psychiatric Disorders | | | |
| Yes                  | 8 (12.7%) | 6 (6.7%) | X²=1.62, p= 0.16 |
| No                   | 55 (86.3%) | 84 (93.3%) |           |
| Family History of AA |           |           |           |
| Yes                  | 12 (19.00%) | 1 (0.01%) | p<0.001 * |
| No                   | 51 (81.00%) | 90 (99.9%) |           |
| PSWQ                 | 44.02 ± 11.59 | 39.71 ± 7.77 | t=-3.27, p= 0.001 |

* Fischer Exact Test

## Discussion

Psychodermatology investigates the relationship between psychiatric disorders and dermatological diseases. AA is one of the most-investigated diseases in the psychodermatology field. AA causes significant problems in the appearance of individuals. As a result, patients with AA may develop psychiatric conditions because of emotional stress [7,19]. Furthermore, emotional stress is one of the most important environmental etiological factors for AA [6].

AA is considered to be associated with psychiatric disorders, specifically with anxiety and depression. Studies generally investigate anxiety and depression together in patients with AA [19]. In a nationwide study, Chu et al. [20] investigated 5,117 patients with AA and healthy subjects; they reported higher levels of anxiety and depression in patients with AA compared with healthy subjects. Similarly, Aghaei et al. [21] reported that patients with AA had higher levels of anxiety and depression compared with healthy subjects. In their retrospective study, Huang et al. [22] reported that 25.5 % of AA patients had a co-morbid anxiety or depressive disorder. Based on these studies, it can be considered that AA may be strongly associated with anxiety and depression.

Borkevic et al. [23] define worry as “an attempt to engage in mental problem-solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes.” Worry can be regarded as a mental coping process in which the outcome is ambiguous but most likely includes one or more negative outcomes. As a result, worry becomes a fear process. When worry becomes uncontrolled, it may affect the quality of life negatively and it can result in an anxiety disorder [24,25]. Furthermore, when worry becomes persistent, excessive, and generalized it can result in generalized anxiety disorder [26]. Worry does not merely cause generalized anxiety disorder; it can also be an etiological factor in panic disorder, obsessive compulsive disorder, social phobia, and specific phobias [27].

In the present study, we found that pathological worry as measured by PSWQ was significantly higher in patients with AA compared with the HC group. We can conclude two major points from this result. First, pathological worry can be an environmental risk factor for AA. Second, patients with AA may tend to develop several anxiety disorders, particularly generalized anxiety disorder. We suggest that patients with AA be screened specifically with anxiety and depression. Studies generally in -

### Table 2. Linear regression analysis PSWQ and mean age, mean year of education, duration of AA, age of onset of AA, AA: Alopecia Areata

|                      | Unstandardized Coefficients | P values |
|----------------------|----------------------------|----------|
| Mean age             | 0.203                      | 0.312    | 0.51    |
| Mean year of education | 0.600                      | 0.292    | 0.06    |
| Duration of AA       | 0.264                      | 0.321    | 0.85    |
| Age of onset of AA   | -0.122                     | 0.319    | 0.70    |
tor for developing AA—it can also be a result of AA. Second, although our sample size was not small, further studies with larger samples will be needed to identify the role of pathological worry. Third, the patients were not new-onset AA, another possible limitation.

In conclusion, the present study is the first to compare pathological worry between patients with AA and HCs. We suggest that pathological worry should be more thoroughly investigated in patients with AA to improve their quality of life. This can also be an effective approach to targeting those patients who may develop anxiety disorder, with the goal of prevention.

Competing interests
The authors declare that they have no competing interests.

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