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Research Article

Evaluation of Anxiety and Depression in Patients with Androgenetic Alopecia in Shanghai: A Cross-Sectional Study

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Androgenetic alopecia (AGA) affects the quality of life (QoL) and has a negative psychological impact on patients. We sought to investigate the frequency of anxiety and depression in AGA patients and explore their relationship with patients' QoL. This cross-sectional survey enrolled 192 participants with AGA. Hairdex, World Health Organization Quality of life Brief Version (WHOQOL-BREF), and dermatology life quality index (DLQI) instruments were used to assess the QoL of patients, and hospital anxiety and depression scale (HADS) was used to evaluate patients' anxiety symptom and depression symptom. HADS, WHOQOL-BREF, and DLQI scores and domains of the Hairdex score were analyzed using linear regression and Pearson correlation. Apart from self-confidence, all four domains of Hairdex were significantly correlated with depression scores and anxiety scores. All four domains of WHOQOL-BREF were significantly correlated with depression and anxiety scores. While all six domains of DLQI were also significantly correlated with anxiety scores only. This study demonstrates a significant correlation between psychiatric morbidity and QoL in individuals with AGA. Hence, psychiatric treatment evaluations should be considered.

1. Introduction

Hair is a characteristic human feature. In course of history, hair has played a significant role in self-identity. Hair loss can lead to distortion of body image, which might have a negative psychological impact on one's quality of life (QoL) [1].

AGA (androgenetic alopecia) is a hair loss disorder that impacts both men and women and is one of the most prevalent types of hair loss conditions. It is characterized by a progressive miniaturization of the hair follicle that results in terminal hair's transition into vellus. Onset can occur at any age after puberty and its incidence increases with age. By the age of 70 years or older, 80% of white men and 40% of women have AGA symptoms [2]. About 50 million men and 30 million women in the USA have AGA, according to 2018

National Institutes of Health (NIH) research data. The disease is predominant in men and its prevalence gradually increases with age. The prevalence of AGA in Caucasian men is >80% and >40% in women [2]. In the Chinese population, its prevalence in males is approximately 21.3% and that in females is approximately 6.0% [3, 4].

AGA has a huge impact on an individual's image and QoL, leading to a negative psychological state including self-consciousness, worries about aging, helplessness, feelings of diminished attractiveness, emotional anxiety, and depression. Several studies have found that hair loss affects the QoL of patients and negatively affects their psychology [5, 6]. QoL of patients with AGA is compromised because of the continued course of the disease. As a result, psychosocial management is critical in this situation, as with any disease condition. To date, studies assessing QoL in patients with

AGA remain scarce, particularly those addressing the psychological impact of the disease and how it can be linked to QoL. The objective of our research was to assess the levels of anxiety and depression among individuals with AGA and to investigate and their association with QoL.

2. Objectives

This study's primary objectives were (a) to investigate the prevalence of anxiety and depression among individuals with AGA, (b) to examine whether there is a relationship between mental health issues such as anxiety and depression, and the QOL experienced by individuals with AGA.

3. Materials and Methods

3.1. Study Design. The study included patients who had obtained a dermatologist's clinical diagnosis of AGA and were between the ages of 18 to 60. The diagnosis is primarily clinical, based upon the patient's family history, hair loss pattern, hair pull test, and dermoscopy [7]. Every patient went through a trichoscopy to confirm the diagnosis of androgenetic alopecia. Trichoscopy hair loss locations are frontal, parietal, and occipital areas using a FotoFinder dermoscopy. A dermoscopic diagnosis is made by confirming the presence of miniaturised follicles, which are follicles with varied sizes. Additional symptoms include honeycomb pigmentation, a brown halo around the periphery, and yellow specks [7]. Dermatologists evaluated the classification of AGA with the Hamilton–Norwood scale [8] (H-N scale) for male AGA patients and the Sinclair scale [9] for female AGA patients. The degree of hair loss was classified into 3 categories. The H-N scale categories: mild (Type I-II), moderate (Type IIa-III vertex), and severe (Type IV–VII). The Sinclair scale categories: mild (Type I), moderate (Type II), and severe (Type III–V). For evaluating the QOL, we used the Hairdex questionnaire [10], World Health Organization Quality of life Brief Version (WHO-QOL-BREF) [11], and dermatology life quality index (DLQI) [12]. The tool we used to measure levels of anxiety and depression in our study was the hospital anxiety and depression scale (HADS) [13]. Prior to participating in the study, all individuals were informed about the purpose of the research, were asked to provide informed consent, and were provided directions regarding completing the study questionnaires. This study did not include participants who were known to have psychiatric illnesses. This study was registered with the Shanghai Tongji Hospital Ethical Committee (ID: K-2022-001).

3.2. Data Collection. This cross-sectional study was carried out at the Department of Dermatology, Hair medical center of Shanghai Tongji Hospital affiliated to Tongji University, from January 2021 to July 2022. This study was conducted by directly interacting with the study participants in person.

The Hairdex is a tool that is designed to assess the influence of alopecia on the QoL of patients. The questionnaire consists of a total of forty-eight items that are used to evaluate the impact of hair loss across several domains, such as symptoms, functioning, emotion, self-confidence, and stigmatisation. The questionnaire uses a scoring system ranging from 0 to 4 to evaluate each item, where 0 represents no effect on the patient's quality of life (QoL) and 4 signifies a significant negative impact on their QoL. In other words, the higher the score, the greater the negative impact of hair loss on the patient's QoL [10].

WHOQOL-BREF is one of the most commonly used instruments to assess the QoL. It is divided into 4 domains including psychological, social, environmental, and physical domain. Individual question is scored on a 5-point Likert scale where 1 represents the least negative attitude and 5 is the most favourable attitude. Then, scores are converted into a 0–100 scale. The WHOQOL-BREF questionnaire has a score range of 26 to 130 [11, 14].

DLQI is a dermatology-specific questionnaire, comprising 10 questions, considered for use in adults. It measures the extent to which a skin disease impact on the day-to-day lives of the patient over the past 7-day period. The DLQI questionnaire is divided into six different dimensions, which include symptoms and feelings, daily activities, leisure, work or school, personal relationships, and treatment. Each question in the questionnaire is scored on a scale from 0 to 3, with the score corresponding to the individual's response to the question. In other words, the score reflects the degree to which the individual is impacted by the specific dimension being assessed. Specifically, higher scores on the DLQI were associated with greater levels of impairment [12].

The HADS is a self-reported assessment scale consisting of 14 items. It gives clinicians a reliable and useful instrument for measuring depression and anxiety in individuals who need additional psychiatric assessment and support. It was intended to measure anxiety (HADS-A) and depression (HADS-D) (each subscale has seven questions, range 0–21 per score). The scores for anxiety/depression were divided into three categories: scores 0–7 as normal, scores 8–10 as borderline abnormal, and scores 11–21 considered as abnormal [13].

3.3. Statistical Analysis. All the data analyses were performed with SAS version 9.4 (SAS Institute, Inc., Cary, NC, U.S.A). Continuous variables are shown as mean ± standard deviation (SD), while categorical variables are shown as frequencies (percentages). The correlation between HADS-A and HADS-D scores was compared using a *T*-test or Wilcoxon rank-sum test in the manner of sex, age, relationship status, birthplace, and family hair loss history. To determine the relationship between anxiety and depression scores (HADS-A and HADS-D) with polytomous variables such as education level, duration of AGA, severity of disease, and body mass index (BMI), ANOVA tests were conducted.

The role of potential risk factors including sex, age, education level, relationship status, birthplace, family hair loss history, duration of AGA, severity of disease, and BMI category) in HADS responses was evaluated using logistic regression models based on HADS scores dichotomised as normal or abnormal/borderline as the dependent variables. The cutoff abnormal/borderline HADS score was >7.

Linear regression models and Pearson correlation analyses were used to present the correlation between the continuous variables, HADS-A, and HADS-D scores and between HADS scores and domains of Hairdex, WHOQOL-BREF, and DLQI scores.

To further explore specific items in the HADS questionnaire related to anxiety and depression, an item-level analysis was conducted using multiple logistic regression analyses. The item responses were evaluated using the HADS questionnaire. Each question was dichotomised as ≤1 (sometimes or not at all) or >1 (often or most of the time). Results were reported as odds ratios (OR), and P values <0.05 were considered as statistically significant.

4. Results

4.1. Demographics. A total of 192 participants clinically diagnosed with AGA were enrolled in the survey. The response rate of this study was 100%. The majority were single (71.4%), younger than 30 years old (65.6%), and male (61.5%). The male:female ratio in our study was 1.6 : 1 (Table 1).

4.2. Occurrence of Anxiety and Depression in AGA Patients. Analyzing the HADS, the mean score for HADS-anxiety was 6.12 (SD: 3.51), and 28.13% had borderline/abnormal scores, indicative of an anxiety disorder. The mean score for HADS-depression was 6.30 (SD: 2.44), and 28.13% had borderline/abnormal scores, indicative of a depression disorder. The HADS-anxiety scores correlated well with the HADS-depression scores in each patient ($P < 0.001$) (Figure 1), suggesting that AGA patients experienced a greater degree of anxiety and depression all together.

4.3. Variables Associated with Anxiety and Depression in AGA Patients. No correlation was observed on the basis of sex in the HADS-D ($P = 0.7460$) and HADS-A ($P = 0.534$). Age younger than 30 years had a significantly higher impact on the HADS-A ($P < 0.001$). Regarding the relationship status, being single had a higher impact on the HADS-A ($P = 0.0061$). There was no statistically significant relationship discovered between anxiety and depression levels and patient education, birthplace, family hair loss history, duration, severity, and BMI (Table 1).

In the logistic regression model, scores in the borderline/abnormal range demonstrated that individuals aged ≤30 years were significantly more likely to have anxiety than those aged >30 years (OR: 0.27; 95% CI: 0.12–0.61). Regarding education, our study found that anxiety was significantly less common in those with a bachelor's degree than in those with high school education (OR: 0.39; 95% CI: 0.15–1.00), and depression had a similar situation, compared with individuals with high school education, those with a bachelor's degree (OR: 0.34; 95% CI: 0.13–0.86) or with a master's degree (OR: 0.19; 95% CI: 0.057–0.67) were all less likely to suffer from depression. Unmarried individuals were significantly more likely to have anxiety than those who were married (OR: 2.58; 95% CI: 1.16–5.74). According to our

study results, not having a family hair loss history of AGA had a more significant impact on depression than having a family hair loss history of AGA (OR, 0.46; 95% CI, 0.24–0.88) (Table 2).

4.4. Item Analysis of the HADS Questionnaire in AGA Patients. A multiple logistic regression model was used for item-level analysis. HADS score responses were used to identify which items had more influence on patients with AGA. In the HADS-A, all questions had a statistically significant influence on patients. The question with the highest influence was question 7 (I can sit at ease and feel relaxed, OR: 21.904; 95% CI, 7.694–62.357; $P < 0.001$). In the HADS-D, questions Q2, Q4, Q6, Q8, and Q12 had a statistically significant influence on patients. In the HADS-D, the most influential question was question 2 (I still enjoy the things I used to enjoy; OR: 6.188; 95% CI, 3.401–11.261; $P < 0.001$) (Figure 2).

4.5. Association between the HADS and QoL in AGA Patients. Our results indicated a correlation between the scores of anxiety symptom, depression symptom, and each domain in Hairdex. The HADS-A and HADS-D scores were significantly positively correlated in the three domains (symptoms, function, and emotions) in the Hairdex instrument (all Pearson P values <0.001). Positive correlations were found between HADS-A and stigmatisation ($P < 0.001$) and HADS-D and stigmatisation ($P = 0.002$). However, no correlation was detected between the HADS-A and self-confidence ($P = 0.980$), as well as between the HADS-D and self-confidence ($P = 0.604$) (Table 3). The total score of WHOQOL-BREF was significantly negatively correlated with HADS-A and HADS-D scores ($P < 0.001$). HADS-A and HADS-D scores were significantly negatively correlated in all four domains in the WHOQOL-BREF instrument (all Pearson P values <0.001). Furthermore, The DLQI total score was positively correlated with HADS-A ($P < 0.001$) and HADS-D ($P = 0.026$). All six domains of DLQI showed a significantly positively correlated with anxiety scores (all Pearson P values <0.001). The two domains of DLQI (symptoms and feelings; work and school) were positively correlated with depression scores ($P < 0.05$).

5. Discussion

The purpose of the study was to evaluate the anxiety and depression in AGA and their association with QoL. Anxiety disorder/symptom and depression disorder/symptom were estimated using the HADS, and QoL was measured using the Hairdex, WHOQOL-BRFE, and DLQI. Our study revealed that AGA causes anxiety and depression and is significantly associated with QoL. This is comparable to the results of previous studies evaluating anxiety and depression in alopecia [15–18].

The HADS is a multidimensional psychological health assessment tool that has been extensively examined in a variety of medical illnesses. It is not particular to skin diseases. We compared the scores of HADS-A and HADS-D in individuals with AGA to those of eight other dermatological conditions (Table 4) [15, 16, 19–26]. The anxiety scale

Table 1: Clinical and demographical data of the patients in the study.

| Variables	N (%)	HADS-D (mean ± SD)	P value	HADS-A (mean ± SD	P value
Sex					
Female	74 (38.5%)	6.23 (2.67)	0.7460	6.32 (3.60)	0.5342
Male	118 (61.5%)	6.35 (2.30)		6.00 (3.46)	
Age					
≤30	126 (65.6%)	6.39 (0.22)	0.4975	6.87 (3.54)	<0.001
>30	66 (34.4%)	6.14 (0.29)		4.71 (3.00)	
Education					
High school	21 (10.9%)	7.72 (2.59)	0.102	7.48 (4.86)	0.289
Bachelor	34 (17.7%)	5.71 (2.08)		5.82 (3.04)	
Master or above	137 (71.4%)	6.23 (2.44)		5.99 (3.35)	
Relationship status					
Single	137 (71.4%)	6.23 (2.46)	0.4986	6.56 (3.38)	0.0061
Married	55 (28.6%)	6.49 (2.41)		5.04 (3.61)	
Place of birth					
Urban	113 (58.9%)	6.13 (2.44)	0.2514	5.94 (3.54)	0.3784
Rural	79 (41.2%)	6.54 (2.44)		6.39 (3.46)	
Family history					
Absent	64 (33.3%)	6.70 (2.61)	0.1077	6.16 (3.86)	0.9307
Present	128 (66.7%)	6.10 (2.34)		6.11 (3.33)	
Duration of AGA					
Less than 1 year	42 (21.9%)	6.33 (2.94)	0.859	6.88 (4.08)	0.393
1–5 years	113 (58.9%)	6.27 (2.35)		6.12 (3.48)	
More than 5 years	38 (19.8%)	6.35 (2.14)		5.30 (2.68)	
Severity of disease					
Mild	75 (39.1%)	6.17 (2.54)	0.175	6.48 (3.33)	0.357
Moderate	100 (52.1%)	6.21 (2.33)		5.76 (3.73)	
Severe	17 (8.8%)	7.41 (2.53)		6.71 (2.78)	
BMI					
<18.5	20	6.45 (2.61)	0.863	6.45 (3.19)	0.289
18.5–24	121	6.28 (2.43)		6.27 (3.64)	
>24	51	6.29 (2.46)		5.65 (5.65)	
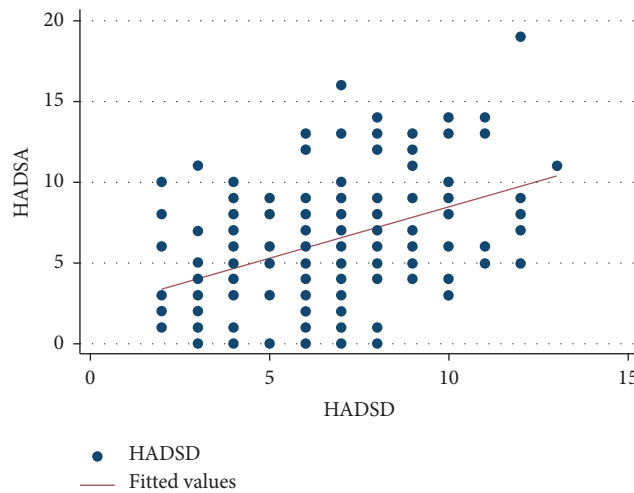
Figure 1: Relation among different hospital anxiety and depression scales (HADS) (A and D) scores.

of HADS-A score (mean 6.12; SD 3.51) showed AGA patients were impacted more by anxiety compared to patients with other skin conditions including bullous pemphigoid (mean 5.91) [19], chronic urticaria (mean 5.8) [20], rosacea (mean 5.55) [23], and mild atopic dermatitis (mean 5.5) [26]. On the depression scale also, HADS-D (mean 6.30; SD 2.44)

TABLE 2: Odds ratios (ORs) for a score in the range of "borderline/abnormal" impact of androgenetic alopecia in HADS-adjusted logistic regression models with age, sex, education, relationship status, place of birth, family history, duration, severity, and BMI as explanatory variables.

Variables	HADS-D>7		HADS-A>7	
	Adjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Sex				
Female vs. male	0.88 (0.46, 1.67)	0.695	0.74 (0.39, 1.40)	0.359
Age				
≤30 vs. >30	0.83 (0.43, 1.63)	0.598	0.27 (0.12, 0.61)	0.001**
Education				
Bachelor vs. high school	0.34 (0.13, 0.86)	0.022*	0.39 (0.15, 1.00)	0.050
Master or above vs. high school	0.19 (0.057, 0.67)	0.009**	0.39 (0.13, 1.25)	0.113
Relationship status				
Married vs. single	0.83 (0.42, 1.64)	0.587	2.58 (1.16, 5.74)	0.020*
Place of birth				
Rural vs. urban	0.92 (0.49, 1.74)	0.799	1.07 (0.56, 2.02)	0.838
Family history				
Present vs. absent	0.46 (0.24, 0.88)	0.018*	1.04 (0.53, 2.02)	0.910
Duration of AGA				
1–5 years vs. less than 1 year	0.84 (0.39, 1.83)	0.666	0.86 (0.40, 1.84)	0.698
More than 5 years vs. less than 1 year	0.83 (0.31, 2.19)	0.702	0.47 (0.16, 1.32)	0.152
Severity of disease				
Moderate vs. mild	0.80 (0.41, 1.57)	0.522	0.56 (0.29, 1.09)	0.091
Severe vs. mild	1.69 (0.57, 4.99)	0.346	1.03 (0.34, 3.09)	0.961
BMI				
18.5–24 vs. <18.5	0.95 (0.34, 2.67)	0.922	0.73 (0.27, 1.97)	0.530
>24 vs. <18.5	0.79 (0.25, 2.51)	0.700	0.70 (0.23, 2.12)	0.532

SD, standard deviation; HADS, hospital anxiety and depression scale; BMI, body mass index; AGA, androgenic alopecia; $P < 0.05^*$; $P \leq 0.01^{**}$.
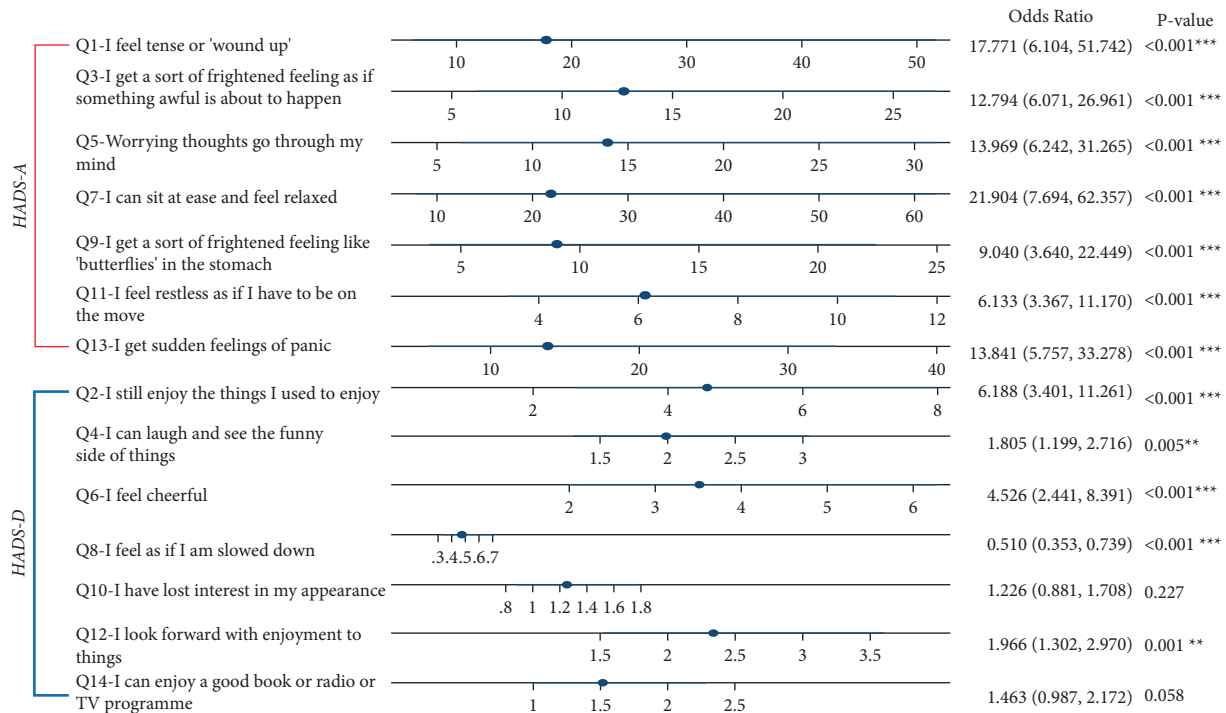

FIGURE 2: Item-level analysis on the effect of hospital anxiety and depression scale responses on androgenetic alopecia. The results are adjusted odds ratio (OR) and 95% confidence interval (CI). $^{**}P \leq 0.01$; $^{***}P \leq 0.001$.

Table 3: Univariate (Pearson) and multiple linear regression analyses-HADS-A and HADS-D (relation among hospital anxiety and depression scale anxiety and depression scores and all components of DLQI, Hairdex, and WHOQOL-BREF).

Variables	HADS-A				HADS-D			
	Univariate (Pearson)		Multiple linear regression		Univariate (Pearson)		Multiple linear regression	
	Pearson CC	Pearson P value	β (95% CI)	P value	Pearson CC	Pearson P value	β (95% CI)	P value
Sex	—	—	−0.32 (−1.35, 0.70)	0.534	—	—	0.12 (−0.59, 0.83)	0.746
Age	−0.3265	<0.001	−0.17 (−0.23, −0.097)	<0.001	−0.0464	0.5227	−0.016 (−0.067, 0.034)	0.523
Symptoms of Hairdex	0.4011	<0.001	0.34 (0.23, 0.045)	<0.001	0.3409	<0.001	0.19 (0.12, 0.28)	<0.001
Function of Hairdex	0.4120	<0.001	0.21 (0.15, 0.28)	<0.001	0.3123	<0.001	0.11 (0.064, 0.16)	<0.001
Emotions of Hairdex	0.4851	<0.001	0.18 (0.13, 0.22)	<0.001	0.3473	<0.001	0.089 (0.055, 0.12)	<0.001
Self-confidence of Hairdex	−0.0018	0.9798	−0.00042 (−0.033, 0.032)	0.980	0.0377	0.6038	0.0060 (−0.017, 0.029)	0.604
Stigmatisation of Hairdex	0.4038	<0.001	0.19 (0.13, 0.26)	<0.001	0.2210	0.0021	0.076 (0.028, 0.12)	0.002
WHOQOL-BREF	−0.43	<0.001	−0.029 (−0.039, −0.021)	<0.001	−0.3613	<0.001	−0.018 (−0.024, −0.011)	<0.001
Physical health of WHOQOL-BREF	−0.3175	<0.001	−0.093 (−0.13, −0.053)	<0.001	−0.2617	0.0002	−0.053 (−0.081, −0.025)	<0.001
Psychological of WHOQOL-BREF	−0.2648	0.0002	−0.073 (−0.11, −0.035)	<0.001	−0.2691	0.0002	−0.052 (−0.078, −0.025)	<0.001
Social relationships of WHOQOL-BREF	−0.4476	<0.001	−0.088 (−0.11, −0.063)	<0.001	−0.3760	<0.001	−0.052 (−0.069, −0.033)	<0.001
Environment of WHOQOL-BREF	−0.4127	<0.001	−0.096 (−0.13, −0.066)	<0.001	−0.3236	<0.001	−0.052 (−0.074, −0.030)	<0.001
DLQI	0.3360	<0.001	0.26 (0.17, 0.38)	<0.001	0.1602	0.0264	0.089 (0.011, 0.17)	0.026
Symptoms and feelings of DLQI	0.3503	<0.001	1.06 (0.65, 1.47)	<0.001	0.1824	0.0113	0.39 (0.088, 0.68)	0.011
Daily activities of DLQI	0.2885	<0.001	0.89 (0.47, 1.31)	<0.001	0.1290	0.0746	0.28 (−0.028, 0.58)	0.075
Leisure of DLQI	0.2296	0.0014	0.62 (0.24, 0.99)	0.001	0.0933	0.1982	0.17 (−0.092, 0.44)	0.198
Work and school of DLQI	0.2262	0.0016	1.11 (0.43, 1.79)	0.002	0.1682	0.0197	0.57 (0.093, 1.06)	0.020
Personal relationships of DLQI	0.1803	0.0124	0.74 (0.16, 1.32)	0.012	0.0760	0.2945	0.22 (−0.19, 0.63)	0.294
Treatment of DLQI	0.2238	0.0018	1.39 (0.52, 2.26)	0.002	0.0690	0.3413	0.29 (−0.32, 0.92)	0.341

TABLE 4: HADS scores of AGA patients and other dermatologic conditions.

Diseases	Total participants (N)	HADS-A Mean (SD)	HADS-D Mean (SD)
Bullous pemphigoid [19]	57	5.91 (2.30)	7.77 (2.36)
Chronic urticarial [20]	79	5.8 (3.6)	7.2 (3.6)
Facial acne [21]	60	11.00 (4.10)	8.47 (3.03)
HS [22]	110	7 (4)	6 (4)
Rosacea [23]	201	5.55 (3.82)	4.84 (3.59)
Vitiligo [24]	37	7.5 (3.8)	5.7 (4.3)
Psoriasis [25]	180	6.9 (4.2)	4.7 (4.6)
AD (mild) [26]	536	5.5 (7.0)	3.8 (3.7)
AD (moderate) [26]	513	7.3 (4.2)	5.5 (3.9)
AD (severe) [26]	395	9.4 (4.1)	8.2 (4.4)
Scarring alopecia [15]	19 (only female)	8.3 (3.2)	8.1 (2.7)
Nonscarring alopecia [15]	25 (only female)	6.2 (2.0)	5.4 (2.3)
AGA (before treatment) [16]	128	6.2 (3.17)	4.0 (2.52)
AGA (after treatment) [16]	128	6.6 (3.06)	4.6 (3.19)
AGA	**192**	**6.12 (3.51)**	**6.30 (2.44)**

Bold values are those derived from our study. 0-7 is normal, 8-10 is borderline, >10 is abnormal.

shows AGA patients were impacted more by depression compared to patients with other skin conditions including hidradenitis suppurative (mean 6.0) [22], rosacea (mean 4.48) [23], vitiligo (mean 5.7) [24], psoriasis (mean 4.7) [25], mild atopic dermatitis (mean 3.8) [26], and moderate atopic dermatitis (mean 5.5) [26]. This indicates that patients' lives are indeed impaired by anxiety and depression and certain dermatological diseases are not only cosmetic concerns but can greatly influence a person's psychological well-being.

Our analysis showed no statistically significant difference between genders. However, Russo et al., show female patients were affected more by anxiety [18]. This may be due to the predominantly female population of their study. In our analysis, HADS-A identified that an age younger than 30 years was associated with higher anxiety with a mean of 6.87 compared to an age older than 30 years. Furthermore, the single participant had higher anxiety with a mean of 6.56 compared to the married participant. The key influencing factors might be younger patients' involvement in daily social performance-related situations and older patients might have developed coping mechanisms compared to younger patients.

Our results suggest that there was no association between education, place of birth, duration, severity, and BMI with the scores of anxiety symptom and depression symptom. However, our results in logistic regression analysis of borderline/abnormal scores of patients illustrated that a bachelor's degree and a master's degree or above had a lesser impact on depression compared to only a high school education. This demonstrates that education helps patients with AGA to come to terms with their condition and patients with lesser education are more likely to develop depression. Regarding family history, participants without a family history of AGA were more impaired by depression compared to participants with a positive family history of AGA. This indicates that individuals with a positive family history of AGA have a better understanding of AGA. Furthermore, our analysis depicted that the anxiety and depression scores in HADS were significantly associated with four domains (symptom, function, emotion,

stigmatisation, and self-confidence was excluded) in the Hairdex instrument. In our research, we observed a significant negative correlation between the overall scores on the WHOQOL-BREF and the scores on both the HADS-A and HADS-D assessments. Our study found a significant correlation between scores on the HADS-anxiety and HADS-depression assessments, across all four domains evaluated in the WHOQOL-BREF instrument. Furthermore, DLQI total score was positively correlated with the scores of anxiety symptom and depression symptom. A study conducted by Katoulis et al. [15] also found a robust positive association between the overall score on the DLQI and both the HADS total score, as well as the HADS-A and HADS-D subscale scores. All six domains of DLQI were a statistically positive correlation with anxiety scores. The symptoms and feelings domain and work and school domain of DLQI were correlated with depression scores. This shows that psychological behaviour is far more influenced by a patient's subjective assessment of AGA than by objective severity.

6. Limitations

This study had some limitations. First, this cross-sectional survey, which is focused on a single hospital, will only reveal the prevalence at a specific time, limiting the generalisability of our study. Second, all the questionnaires were self-reported by participants; therefore, reporting bias may be a confounding factor.

7. Conclusion

In conclusion, anxiety and depression affected a substantial proportion of patients with AGA. Those aged younger than 30 years and those who are single may be linked with a higher risk of anxiety, and a lower education level is linked with a higher risk of depression. An objective medical examination alone cannot determine how well a patient observes the severity of the disease; hence, the QoL is a better determinant for establishing anxiety and depression.

Dermatologists should consider screening and treating psychosocial issues that might supplement objective assessments, improve the evaluation of patients with AGA, and support effective treatment.

Data Availability

The data used to support the findings of this study are not publicly available due to privacy or ethical restrictions and are available from the corresponding author upon request.

Disclosure

Linli Yu and SathishKumar Moorthy should be considered joint first authors. Linli Yu is the submitting author and her institutional email address is 2031187@tongji.edu.cn.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authors' Contributions

Linli Yu and Xin Huang conceptualized the study; Linli Yu and SathishKumar Moorthy proposed the methodology; Linli Yu and SathishKumar Moorthy carried out the formal analysis and investigated the study; Linli Yu wrote the original draft; Linli Yu, Xin Huang, Zikai Zhang, and SathishKumar Moorthy reviewed and edited the manuscript; Xin Huang, Linli Yu, SathishKumar Moorthy, Lin Peng, Liangliang Shen, Yu Han, and Yanqiao Li managed the resources; and Xin Huang carried out the supervision. All authors have read and agreed to the submitted version of the manuscript.

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