

Original Article

Anxiety and Depression in Egyptian Patients with Acne Vulgaris

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Abstract

Background: Acne vulgaris is a prevalent skin condition that may affect the perception of body image and adversely affect social and psychological states. This disease has been associated with rates of depression, anxiety, failure to thrive at school and in social environments, suicidal ideation, and suicidal attempts that are higher than in individuals without this disease.

Objective: To estimate the frequency of anxiety and depression in patients with acne vulgaris and determine the association between acne severity and anxiety and depression in those patients

Methods: A comparative cross-sectional study was conducted in Zagazig University Hospital on 92 subjects (46 patients with acne and 46 individuals without acne); they were interviewed. The researcher used the Global Acne Grading System (GAGS) to classify acne and the Hospital Anxiety and Depression Scale (HADS) to determine anxiety and depression.

Results: In the acne group, 23.9% had anxiety and 13.1% had depression. In the control group, 6.5% had anxiety and 4.3% had depression; the difference was statistically significant. Of the acne group patients with severe acne, 66.7% had anxiety and 44.4% had depression. There was a significant correlation between the severity of acne evaluated by GAGS and HADS for anxiety ($r = 0.712$, $p < 0.001$) and GAGS and HADS for depression ($r = 0.584$, $p < 0.001$).

Conclusion: Acne vulgaris may be associated with depression and anxiety, with a linear relationship between its severity and the presence of depression and anxiety. Patients with acne vulgaris should undergo a continually psychiatric evaluation by their primary care physician to avoid the negative effects on their mental and social health.

Keywords: Acne vulgaris, anxiety, depression

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INTRODUCTION

Acne vulgaris is a skin condition that affects approximately 80% of adolescents.⁽¹⁾ This chronic inflammatory disease of the pilosebaceous unit is commonly observed on the face, affecting an individual's visual appearance.⁽²⁾

Besides acne's negative cosmetic effect, acne harms the patient's self-image and may negatively affect social relations.⁽³⁾ Patients with acne vulgaris have an increased risk of anxiety and depression; thus, these patients have an increased risk of suicidal tendencies and difficulties in social, occupational, and academic fields.⁽²⁾

Studies have demonstrated a high frequency of depression and anxiety in patients with acne (26%–44%) and a suicide rate of approximately 6%–7.1%, which is a high psychiatric comorbidity preceding other chronic

medical diseases such as bronchial asthma, diabetes mellitus, and arthritis.⁽⁴⁾ A study in Egypt reported 82.7% anxiety and 76.9% depression in adolescents with acne.⁽⁵⁾ Another Egyptian study found no statistically significant differences in anxiety and depression between individuals with acne and the control group.⁽⁶⁾

Attention should be paid to acne patients' psychosomatic aspects because the psychic comorbidities are probably more significant than those that are assumed, especially when there is a suspicion of depression or anxiety disorders or evidence of suicidal ideation or body dysmorphic disorders. Patients who report high emotional distress should be treated. Psychotherapy and psychopharmacology sometimes must be coupled with systemic and topical treatments of acne.⁽⁷⁾

The study aimed to estimate the frequency of anxiety and depression in patients with acne vulgaris and to

determine the association between acne severity and anxiety and depression in those patients.

METHODS

A comparative cross-sectional study was conducted at the dermatology outpatient clinic of the Zagazig University Hospitals.

The sample was calculated by using computer software (Open Epi). The researcher assumed that the percentage of anxiety was 68.3% in the patients with acne vulgaris group and 39.1% in the control group.⁽⁸⁾ The sample size was calculated at 95% confidence level and 80% detection power. It was found to be at least 92 subjects: 46 patients with acne and 46 healthy controls.

This study enrolled an accessible sample of 46 patients with acne vulgaris from a dermatology outpatient clinic and 46 healthy individuals from a dental clinic (with no acne); the individuals in both samples were aged 14–30 years. The control group was selected from apparently healthy individuals and was matched for age and sex with the study sample.

Hence, the criteria for inclusion in this study were as follows: patients with acne vulgaris of both sexes, aged 14–30 years, attending the dermatology outpatient clinic of Zagazig University Hospitals, and agreeing to participate in the study. The researcher used this age group because acne presents early with puberty and persists in approximately 43% of individuals into the ages of 30–39 years.

Patients who were pregnant or lactating; those with chronic diseases such as heart, pulmonary, joint disorders, diabetes, and epilepsy; those with a history of corticosteroid, oral contraceptive pill, and iron intake; and those diagnosed with active malignancy were excluded from this study.

Data Collection

All participants completed an interview questionnaire. The time necessary for each questionnaire was 10–20 minutes. The study was conducted from July through September 2020.

The questionnaire comprised the following:

- Personal and medical data: age, sex, marital status, and family history of acne.
- Global Acne Grading System (GAGS): GAGS is a scoring system for acne and is based on evaluating six anatomic areas. Each area receives a numeric value based on the size, called a factor (the forehead and each cheek, 2; the chin and nose, 1; the chest and upper back, 3). Each lesion receives a value depending on its severity: no lesions = 0, comedones = 1, papules = 2, pustules = 3, and nodules = 4. Each area's score is calculated by using the formula: local score = Factor × Grade (0–4). The global score is the sum of the local scores, and acne severity is graded by using the global score: 1–18 is mild, 19–30 is moderate, 31–38 is severe,

and >39 is very severe.⁽⁹⁾ The researcher assessed the type of skin lesion for each case.

- Hospital Anxiety and Depression Scale (HADS): HADS is a validated 14-item scale used to determine anxiety and depression levels that generates ordinal data. Seven items relate to anxiety, and seven items relate to depression. Each item is scored from 0 to 3. Therefore, the score is between 0 and 21 for either anxiety or depression: 0–7 is normal, 8–10 is borderline abnormal, and 11–21 is abnormal.⁽¹⁰⁾ This tool was translated into Arabic, validated, and tested for reliability in 2017.⁽¹¹⁾

Statistical analysis

The data were entered and analyzed by using SPSS version 20.0. The data were presented as frequency and percentages for qualitative variables and mean and standard deviation for quantitative variables. Chi-square and Fisher's exact tests were used for testing the statistical differences between qualitative variables and the t test for quantitative variables. The correlations among the GAGS and HADS scores for anxiety and depression in acne vulgaris cases were calculated by using Pearson correlation analyses. The results were considered statistically significant when the significant probability was <0.05.

Ethical Considerations

Permission was obtained from the family medicine department–faculty of medicine. Official approval was also obtained from the Institutional Review Board faculty of medicine at Zagazig University (6663/14-6-2020) before collecting data. Written consent was obtained from each participant before the interview. The study's purpose was explained to each participant, and the confidentiality of collected data was assured. The study conformed to the international ethics guidelines and those of the Declaration of Helsinki.

RESULTS

Each group comprised 46 patients (13 males and 33 females); the percentage of males was 28.3%, with a mean age of 19.78 ± 4.13 years in the acne group and 19.72 ± 3.42 years in the non-acne group. There was no significant difference between the acne group and non-acne group in sex, age, and marital status; a significant difference was observed between the two groups in the family history of acne (Table 1).

Table 2 shows that anxiety was present in 23.9% of the acne group and in 6.5% of the controls; depression was present in 13.1% of the acne group and in 4.3% of the controls. The differences were statistically significant. The mean score of anxiety was 8.80 ± 2.51 and 7.06 ± 2.44 , respectively, in the acne and control groups; thus, a significant difference was observed. The mean score of depression was 7.61 ± 2.49 and 6.63 ± 1.81 , respectively, in the acne and control groups; thus, a significant difference was observed.

Table 1: Distribution of sociodemographic characteristics and family history of acne in the acne and control groups

Variable	Group 1 with acne vulgaris (n = 46)	Group 2 with no acne vulgaris (n = 46)	Test of significance	p value
	No. (%)	No. (%)		
Sex				
Male	13 (28.3)	13 (28.3)	Chi-square	1.00
Female	33 (71.7)	33 (71.7)		
Age by years (mean ± SD)	19.78 ± 4.13	19.72 ± 3.42	t test	0.934
Marital status				
Unmarried	32 (69.6)	29 (63.1)	Chi-square	0.659
Married	14 (30.4)	17 (36.9)		
Family history of acne				
Positive	27 (58.7)	12 (26.1)	Chi-square	0.003*
Negative	19 (41.3)	34 (73.9)		

*significant at $p < 0.05$ **Table 2: Distribution of anxiety and depression among the acne and control groups**

Variable	Group 1 With acne vulgaris (n = 46)	Group 2 with no acne vulgaris (n = 46)	Test of significance	p value
	No. (%)	No. (%)		
Anxiety				
Normal	16 (34.8)	28 (60.9)	Chi-square	0.016*
Borderline	19 (41.3)	15 (32.6)		
Abnormal	11 (23.9)	3 (6.5)		
mean ± SD	8.80 ± 2.51	7.06 ± 2.44	t test	0.007*
Depression				
Normal	22 (47.8)	35 (76.1)	Chi-square	0.019*
Borderline	18 (39.1)	9 (19.6)		
Abnormal	6 (13.1)	2 (4.3)		
mean ± SD	7.61 ± 2.49	6.63 ± 1.81	t test	0.034*

*significant at $p < 0.05$

Among the patients with acne, 21 had mild acne (45.6%), 16 had moderate acne (34.8%), and nine had severe acne (19.6%); according to GAGS, no patients had very severe acne. Approximately 66.7% of patients with severe acne

had anxiety, and 44.4% of patients with severe acne had depression. The difference in the anxiety and depression and the acne severity was statistically significant ($p < 0.001$) (Table 3).

Table 3: Relationship between acne severity and presence of anxiety or depression

Variable	Acne severity			Test of significance	p value
	Mild (n = 21) No. (%)	Moderate (n = 16) No. (%)	Severe (n = 9) No. (%)		
Anxiety					
Normal	15 (71.4)	1(6.2)	0 (0.0)	Fisher's exact	0.001*
Borderline	5 (23.8)	11(68.8)	3 (33.3)		
Abnormal	1(4.8)	4(25.0)	6 (66.7)		
Depression					
Normal	17 (80.9)	5(31.2)	0 (0.0)	Fisher's exact	0.001*
Borderline	3 (14.3)	10(62.5)	5 (55.6)		
Abnormal	1(4.8)	1(6.3)	4 (44.4)		

*significant at $p < 0.05$

The mean scores of anxiety and depression were significantly higher in the acne group than in the non-acne group in all sexes and age groups as well as among the unmarried members in the acne group than for their unmarried counterparts in the control group. The anxiety

scores were significantly higher for the married members of the acne group than their married counterparts in the control group. On the other hand, depression among married individuals did not seem statistically significant (Table 4).

Table 4: Anxiety and depression mean scores in relation to demographic factors of the acne and control groups

Variable	Anxiety (mean \pm SD)			Depression (mean \pm SD)		
	Group 1	Group 2	p value	Group 1	Group 2	p value
	with acne vulgaris (n = 46)	with no acne vulgaris (n = 46)		with acne vulgaris (n = 46)	with no acne vulgaris (n = 46)	
Sex						
Male	8.46 \pm 2.93	7.00 \pm 2.19	0.008*	7.61 \pm 1.89	6.53 \pm 1.61	0.004*
Female	8.94 \pm 2.74	7.09 \pm 2.36	0.001*	7.60 \pm 2.53	6.06 \pm 1.89	0.001*
Age						
≥ 20	9.20 \pm 3.33	6.68 \pm 2.05	0.001*	7.30 \pm 2.25	6.50 \pm 1.41	0.04*
<20	8.50 \pm 2.42	7.41 \pm 2.14	0.005*	7.85 \pm 2.04	6.75 \pm 2.13	0.01*
Marital status						
Unmarried	8.37 \pm 2.25	7.0 \pm 2.69	0.02*	7.81 \pm 2.26	6.55 \pm 2.01	0.006*
Married	9.79 \pm 3.09	7.18 \pm 2.00	0.001*	7.14 \pm 2.22	6.76 \pm 1.44	0.332

*significant at $p < 0.05$

The correlations among the GAGS and HADS scores for anxiety and the GAGS and HADS scores for depression in the patients with acne vulgaris were calculated (Table 5). A significant correlation was found between the GAGS and HADS scores for anxiety ($r = 0.712$, $p < 0.001$) and between the GAGS and HADS scores for depression ($r = 0.584$, $p < 0.001$).

Table 5: Correlations between the GAGS and HADS scores for anxiety and depression in the patients with acne vulgaris

Variable	Correlation	
	r	p value
GAGS scores and HADS for anxiety	0.712	< 0.001
GAGS scores and HADS for depression	0.584	< 0.001

DISCUSSION

Acne vulgaris is one of the most common three inflammatory skin disorders diagnosed and managed by family physicians in countries such as the United Kingdom with a robust primary health care system.⁽¹²⁾

In this study, the occurrence of acne was significantly related to a family history of acne. This result was consistent with the results of two studies: a cross-sectional study conducted in northeast China that demonstrated that undergraduate students developed acne by 78% heritability in first-degree relatives⁽¹³⁾ and a cross-sectional study conducted in Jeddah, Saudi Arabia, with a sample of female, final-year, medical students that demonstrated that the cases of moderate to severe acne were strongly associated with the first-degree relatives' acne history.⁽¹⁴⁾

Anxiety and depression, as assessed by HADS, were significantly observed in the acne group than in the control group: anxiety in the acne group and control group was 23.9% and 6.5%, respectively, and depression in the acne group and control group was 13.1% and 4.3%, respectively. These percentages were consistent with a case-control study conducted in 2014 that assessed anxiety and depression in several dermatological conditions and

demonstrated that the HADS scores for anxiety were significantly higher in patients with psoriasis, vitiligo, and acne eczema than in healthy subjects.⁽¹⁵⁾ Another study examined a sample of high school and college students from central China and reported that patients with acne vulgaris had a higher risk of anxiety and depression than healthy individuals did.⁽¹⁶⁾

A study conducted in the United States suggested that depression was 2 to 3 times more prevalent in patients with acne than in the general population. Approximately 8.8% of the patients with acne fulfilled the criteria for the clinical diagnosis of depression.⁽¹⁷⁾

Similarly, Srivastava et al. (2008) studied 46 patients with acne that reported clinically significant depression (39.1%) but observed a lower prevalence of anxiety (4.4%) than this study did.⁽¹⁸⁾ This difference might have occurred because this study's sample size was small. Additionally, Pawin et al. reported that 56.5% of patients with acne had anxiety⁽¹⁹⁾, and Golchai et al. reported that 68.3% of patients with acne had anxiety.⁽⁸⁾ However, Uhlenhake et al. reported a low prevalence of clinical depression: 8.8% of patients with acne.⁽¹⁷⁾

A study of Egypt evaluated the psychological effect of acne on adolescents and reported that 82.7% of adolescents had anxiety and 76.9% had depression, measured using Hamilton rating scales for anxiety and depression.⁽⁵⁾ Another study evaluated 150 patients with acne and found no statistically significant difference between the acne group and control group in the HADS anxiety and depression scores, with P values of 0.605 and 0.748, respectively.⁽⁶⁾

According to the present study acne severity was significantly associated with anxiety and depression, according to the HADS score: 66.7% of patients with severe acne had anxiety, and 44.4% had depression. Similarly, Erdemir et al. (2013) reported a positive correlation with the HAD anxiety subscale (HAD-A) and HAD depression subscale (HAD-D) scores.⁽²⁰⁾ Also, Saker et al. (2015) reported a positive relation between acne vulgaris severity and anxiety and depression, using the Hamilton Rating Scale for Depression and the Hamilton Rating Scale for Anxiety. About one fifth of patients with

severe acne had severe anxiety, and 2.5% of patients with mild acne had severe anxiety; additionally, 8.8% of patients with severe acne had severe depression, 17.6% had moderate depression, and none of the patients with mild acne had severe depression.⁽⁷⁾ Similarly, Uslu et al. (2008) conducted a cross-sectional analysis of 600 high school students and demonstrated a direct positive correlation between the severity of acne and development of anxiety or depression.⁽²¹⁾

Sundar et al. (2019) demonstrated that as the severity of acne increased, the percentage and severity of the degree of anxiety increased proportionately; 65% and 32.5% of Grade 3 patients with acne had mild anxiety and mild to moderate anxiety, respectively. For the Grade 4 patients with acne, 83% had moderate anxiety, and one patient had moderate to severe anxiety in Grades 3 and 4.⁽²²⁾ Sarkar et al. observed similar results in 2016, as did Purvis et al. in 2006, they have observed a positive correlation between acne grades and anxiety scores.^(23, 24) Among Grade 1 patients with acne, 89% had no depression and 10% had mild depression; in Grade 2 patients with acne, 27% had mild depression, and one patient had moderate depression. In Grade 3 patients with acne, 45% had mild depression, and 22% had moderate depression; in patients with Grade 4 acne, 8% had no depression, 58% had mild depression, and 33% had moderate depression.⁽²²⁾ The severity of acne was directly correlated with depression scores in the patients. Similar results were observed by other studies in 2006, 2008, and 2016.^(24, 21, 23) Elsadek et al. (2021) demonstrated that the mean score of anxiety has a higher significance in moderate acne 19.64 ± 13.29 than in mild acne 13.92 ± 9.85 at $p = 0.013$, but no significance was detected between mild and severe cases. Additionally, the mean score of depression was not significantly different between groups.⁽⁵⁾

Studies have reported no relationship between acne severity and anxiety or depression.^(25-27, 8) Additionally, Abdul Shakoor's study on 101 patients with acne demonstrated that 81.2% had anxiety and that 70.3% had depression. The severity of anxiety and depression did not show a linear relationship with acne severity⁽⁴⁾, and Öztekin recently demonstrated that occurrence of acne, rather than its severity, may cause psychological symptoms.⁽³⁾

In this study, the mean of the anxiety and depression scores was significantly higher in the acne group than in the control group. This finding supports the findings of the cross-sectional study by Golchai et al. (2010) on 82 patients with acne and 82 persons without acne.⁽⁸⁾ The mean scores of anxiety and depression were significantly higher in the acne group than in the control group.⁽⁸⁾

CONCLUSION AND RECOMMENDATIONS

Acne vulgaris may be associated with depression and anxiety, with a linear relationship between its severity and the presence of depression and anxiety. Hence, to detect

cases early, physicians in primary care settings should screen patients with acne for psychological problems by using simple questionnaires such as HADS.

Limitations of the study

Because of the cross-sectional design of the study, the researcher could not establish a causal relationship. A longitudinal study design, including patients' data before and after the onset of acne vulgaris, may eliminate baseline differences and more reliably demonstrate the psychiatric effects caused by acne vulgaris.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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