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Research Article

**PREVALENCE AND PREDICTORS OF DEPRESSION AMONG
ACNE PATIENTS ATTENDING DERMATOLOGY CLINIC IN
HOSPITALS OF MINISTRY OF HEALTH, TAIF CITY,
SAUDI ARABIA, 2021**¹Dr. Saleh Mousa Alkathiri, ²Dr. Mohammed Daifallah Alzaydi¹MBBS, Family Medicine resident R4²MBBS, SBFM, ABFM, Family Medicine consultant**Article Received:** January 2022**Accepted:** January 2022**Published:** February 2022**Abstract:**

Background: Acne vulgaris is a common dermatological disease with a prevalence reaching up to 80% in the second and third decades of life. The psychological impact of acne on patients is significant. The co-existence of acne and depression is a complex issue and, in adolescence, can be associated with developmental outcomes of body image, socialization and sexuality. Since lack of previous literature in the province, this study aims to study the possible association between acne vulgaris and depression and factors affecting that association in Taif, KSA.

Methods: This is a cross-sectional study. All acne patients attended dermatology outpatient clinics in the two hospitals (King Abdulaziz specialized and King Faisal) throughout the period of the study (January-March, 2021) were eligible for inclusion in the study. Patients with concomitant dermatological disorder and/or psychiatric diseases were excluded from the study.

Data was collected using a self-administered questionnaire and depression was assessed using the Patient Health Questionnaire-9 (PHQ-9). **Results and conclusion:** The study included 230 subjects aged 18-43 years with mean (SD) age of 25.5 (6.0). Females comprised 61.3% of participants. The prevalence of depression (combining the last three severity groups) among subjects with acne vulgaris in Taif, KSA is 41.4%. The severity of acne was strongly associated to the severity of depression, as well as the type of acne treatment was linked with depression severity, with participants receiving oral, or oral and topical treatment having more severe depression types than those who did not get treatment.

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INTRODUCTION:

Acne vulgaris is a common dermatological disease with a prevalence reaching up to 80% in the second and third decades of life.⁽¹⁾ It is a disease of the pilosebaceous units, characterized clinically by seborrhea, comedones, papules, pustules, nodules and, in some cases, disfiguring scars which impact greatly the visual appearance.⁽²⁾ The psychological impact of acne on patients is significant. The co-existence of acne and depression is a complex issue and, in adolescence, can be associated with developmental outcomes of body image, socialization and sexuality.⁽³⁾

Previous studies on the psychosocial impact of acne have documented dissatisfaction with appearance, embarrassment, self-consciousness, and lack of self-confidence in acne patients.⁽³⁾ Social dysfunction has also been observed, including concerns about social interactions with the opposite gender, appearances in public, interaction with strangers, and reduced employment opportunities.⁽⁴⁻⁶⁾ Furthermore, acne is associated with anxiety, depression,⁽⁷⁾ feel of anger,⁽⁸⁾ and lower body satisfaction.⁽⁹⁾ It can be negatively associated with intention to participate in sports and exercise.⁽¹⁰⁾

Although depression has been linked to acne medications such as Accutane, a Norwegian study found that the serious mental disorder may be connected to acne itself.⁽¹¹⁾ The same study indicated that depression and suicidal thoughts were two to three times more likely in teenagers with severe acne than in those who did not have the skin condition.⁽¹¹⁾ Psychological impact affects female patients more than male patients.⁽⁷⁾ Even suicidal ideation was found to be around 6-7% in acne patients.⁽¹²⁾ There is no single disease which causes more psychic trauma and more maladjustment between parents and children, more general insecurity and feelings of inferiority and greater sums of psychic assessment than does acne vulgaris.⁽³⁾

Reviewing of literature for similar studies resulted some studies carried out locally and internationally.⁽¹³⁻²³⁾ However, we did not cite any study carried out in Taif in this regards.

This study aims to study the possible association between acne vulgaris and depression and factors affecting that association.

Objectives

- 1- To investigate the association between acne vulgaris and depression among patients attending dermatological out-patient clinics, Ministry of

health, Taif city.

- 2- To study factors associated with depression among patients attending dermatological out-patient clinics, Ministry of health, Taif city.

METHODOLOGY:**Study design**

A cross sectional study.

Study area/setting

The study was carried out in Taif city, Saudi Arabia. It is a city in the Western Region, Saudi Arabi with an estimated population of 993,800 in 2010.⁽²⁴⁾ The study was implemented at dermatology clinics at King Abdulaziz specialized and King Faisal hospitals, Ministry of health in Taif city.

Study period

1. Preparatory period (4-8 weeks)
 - Selecting the title and carrying out the literatures review
 - Taking the permissions
 - Preparing the questionnaire
 - Carrying out a pilot study
 2. Field work (4-6 weeks)
 - Data collection
 - Data entry and analysis
 3. Writing the report (2-4 weeks)
- 3.4 Population
All acne patients attended dermatology outpatient clinics in the two hospitals (King Abdulaziz specialized and King Faisal) throughout the period of the study (January-March, 2021) were eligible for inclusion in the study. Patients with concomitant dermatological disorder and/or psychiatric diseases were excluded from the study.

Sample size and sampling technique

Using the Roasoft online sample size calculator, the sample size was calculated on assumption that the total population of patients with acne who visited these hospitals in three month approximately 600, the prevalence of depression due to acne vulgaris is 15.8%,⁽¹³⁾ 95% confidence interval and 5% acceptable errors, the sample was 211. This sample was be increased to 230 to compensated for possible non-response.

A systematic random sampling technique was adopted in each clinic to recruit patients with diagnosed acne vulgaris, according to the total

number of eligible patients visiting each clinic daily until we reach the required sample size.

Data collection instrument

A self-administered questionnaire was utilized in this study. It consists of four parts:

1. Personal information (age, gender, educational level, marital status, number of children)
2. Medical history and habits (smoking, physical activity, history of chronic illness and family history of mental illness)
3. Specific questions on Acne vulgaris (duration, treatment and severity "information taken from the dermatologist").

The diagnosis of acne included presence of white head comedon and black head comedon, papule, pustule, pseudocyst and scar. It was done by trained dermatology female residents/specialists. Acne was categorized regarding its severity into three degrees; mild acne develops only few (less than 20) non inflamed blackheads or whiteheads, or a moderate number of small, mildly irritated pimples. Blackheads appear as small flesh-colored bumps

Table (1): Severity of depression according to the PHQ-9 score.

| PHQ-9 score | Provisional diagnosis |
|-------------|------------------------------|
| 0-4 | None |
| 5-9 | Mild depression |
| 10-14 | Moderate depression |
| 15-19 | Moderately severe depression |
| 20-27 | Severe depression |

Data collection technique

The authors visited the involved hospitals after getting approval from the Ministry of health and hospital directors. The questionnaires were distributed on the selected patients while they waited for the physician's appointment. Trained nurses helped in data collection. The researchers explained the purpose of the study to all acne patients and did not ask them about their names to ensure confidentiality.

Data entry and statistical plan

The data was collected and verified by hand then coded before computerized data entry. The statistical Package for Social Sciences (SPSS) software version

with tiny, dark dots at their center. Whiteheads have a similar appearance but lack the dark dots. Pimples are mildly uncomfortable and have a white center surrounded by a small area of reddened skin. Moderate acne characterized by more comedones and pimples and sometimes larger, more inflamed pimples (pustules). In severe (deep, or cystic) acne have numerous large, red, painful pus-filled lumps (nodules) that sometimes even join together under the skin into giant, oozing abscesses. ⁽²⁵⁾

4. PHQ-9 which was used to assess depression among the patients.

It can be completed in few minutes and rapidly scored by the researcher. ⁽²⁶⁾ Liu et al ⁽²⁷⁾ reported that the PHQ-9 had a good internal consistency ($\alpha = .80$) and test-retest reliability (intra-class correlation coefficient = 0.87).

The PHQ-9 has 9 questions with a score ranging from 0 to 3 for each setting. The validated Arabic version was utilized in this study. ⁽²⁸⁾ The following table describes the provisional diagnoses for scoring classes. ⁽²⁹⁾

26.0 was used for data entry and analysis. Descriptive statistics (e.g. number, percentage, mean, range, standard deviation) and analytic statistics using chi-square test (χ^2) were applied. Multiple regression analyses was used to determine the significant predictors of depression. P-values ≤ 0.05 was considered as statistically significant.

Ethical considerations

No permission is required to use the Arabic version of the PHQ-9 Questionnaire since permission is not required from the author. Approval from the directors of the involved hospitals was obtained. Individual consent was filled by participants in the questionnaire.

Approval by research and ethical committee in Taif was obtained. Confidentiality was maintained all through the research steps. The researcher explained the purpose of the study to all respondents before data collection.

RESULTS:

As shown in table (2), the study included 230 subjects with acne vulgaris aged 18-43 years with mean (SD) age of 25.5 (6.0). Females comprised 61.3% of the sample, and the majority of participants had a university degree (67.8%), were single (61.7%), were non-smokers (74.8%), exercised irregularly (59.1%), were free of systemic chronic illnesses (89.6%), and had no family members on therapy for psychiatric illnesses. (87.8%).

Duration of acne vulgaris ranged markedly among participants as 37%, 29.1%, and 33.9% reported a 1 to 5, 6 to 10, and 11 to 15 years history with the condition, respectively. Acne symptoms were mild among 59.1% of the sample, moderate among 35.2%, and severe only in 5.7%. Over half the participants (53.9%) reported not using acne therapy, whereas 34.3% reported using local treatment.

Table 3 shows the PHQ-9 score and distribution of depression severity among participants. Mean PHQ-9 score (SD) was 8.8 (6.4). Minimal, mild, moderate, moderately severe, and severe depression were present in 32.2%, 26.5%, 20.9%, 14.8%, and 5.7%, respectively. The prevalence of depression (combining the last three severity groups) among subjects with acne vulgaris in Taif, KSA is 41.4%.

Twelve factors were cross-tabulated with the PHQ-9 depression severities, of which nine were socio-demographic, and three were disease-related factors.

Of the socio-demographic factors, age ($P=0.001$), sex ($P=0.000$), educational level (0.005), marital status ($P=0.020$), having children ($P=0.021$), smoking status ($P=0.013$), exercise ($P=0.038$), having family members on therapy for psychiatric illnesses ($P=0.015$), and history of chronic diseases ($P=0.018$) were significantly associated with depression severity.

Regarding acne-related factors, severity of acne was highly associated with depression severity ($P=0.000$), as severe depression was present among 4.4%, 3.7%, and 30.8% of participants having mild, moderate, and severe acne, respectively.

In addition to severity, type of acne therapy was also significantly associated with depression severity, as subjects taking oral, or oral and topical treatment had more severe depression forms than subjects not taking treatment ($P=0.000$).

Table (2): Sociodemographic characteristics of participants with acne (n=230).

| Parameter | No. (%) | |
|--|------------------------|----------------|
| Age, y | 18-26 | 142 (61.7%) |
| | 27-34 | 65 (28.3%) |
| | 35-43 | 23 (10%) |
| | Mean \pm SD | 25.5 \pm 6.0 |
| Sex | Female | 141 (61.3%) |
| | Male | 89 (38.7%) |
| Educational level | Secondary education | 44 (19.1%) |
| | University degree | 156 (67.8%) |
| | Postgraduate education | 30 (13%) |
| Marital status | Single | 142 (61.7%) |
| | Married | 88 (38.3%) |
| Offspring | No | 175 (76.1%) |
| | Yes | 55 (23.9%) |
| Smoking status | No | 172 (74.8%) |
| | Yes | 41 (17.8%) |
| | Ex-smoker | 17 (7.4%) |
| Exercise | No | 55 (23.9%) |
| | Sometimes | 136 (59.1%) |
| | Yes, regularly | 39 (17%) |
| Family member on therapy for psychiatric illness | No | 202 (87.8%) |
| | Yes | 28 (12.2%) |
| Chronic diseases (DM, HTN, BA, etc...) | No | 206 (89.6%) |
| | Yes | 24 (10.4%) |
| Duration of acne, y | 1 to 5 | 85 (37%) |
| | 6 to 10 | 78 (33.9%) |
| | 11 to 15 | 67 (29.1%) |

| | | |
|---------------------------|--------------|-------------|
| Type of acne therapy used | Oral | 4 (1.7%) |
| | Local | 79 (34.3%) |
| | Both | 23 (10%) |
| | No treatment | 124 (53.9%) |
| Severity of acne | Mild | 136 (59.1%) |
| | Moderate | 81 (35.2%) |
| | Severe | 13 (5.7%) |

Table (3): PHQ-9 score and severity among participants with acne (n=230).

| Parameter | | No. (%) |
|-------------|------------------------------|---------------|
| Severity | Minimal depression | 74 (32.2%) |
| | Mild depression | 61 (26.5%) |
| | Moderate depression | 48 (20.9%) |
| | Moderately severe depression | 34 (14.8%) |
| | Severe depression | 13 (5.7%) |
| PHQ-9 Score | Mean \pm SD | 8.8 \pm 6.4 |

Table (4): Factors associated with PHQ-9 depression severity among individuals with acne (n=230).

| Parameter | | Minimal depression n | Mild depression n | Moderate depression n | Moderately severe depression | Severe depression n | X ² | P-value |
|--|------------------------|----------------------|-------------------|-----------------------|------------------------------|---------------------|----------------|--------------|
| Age, y | 18-26 | 38 (26.8%) | 36 (25.4%) | 30 (21.1%) | 28 (19.7%) | 10 (7%) | 27.8 | 0.001 |
| | 27-34 | 34 (52.3%) | 14 (21.5%) | 13 (20%) | 3 (4.6%) | 1 (1.5%) | | |
| | 35-43 | 2 (8.7%) | 11 (47.8%) | 5 (21.7%) | 3 (13%) | 2 (8.7%) | | |
| Sex | Female | 38 (27%) | 29 (20.6%) | 31 (22%) | 30 (21.3%) | 13 (9.2%) | 26.8 | 0.000 |
| | Male | 36 (40.4%) | 32 (36%) | 17 (19.1%) | 4 (4.5%) | 0 (0%) | | |
| Education level | Secondary education | 14 (31.8%) | 12 (27.3%) | 12 (27.3%) | 4 (9.1%) | 2 (4.5%) | 21.9 | 0.005 |
| | University degree | 40 (25.6%) | 46 (29.5%) | 33 (21.2%) | 27 (17.3%) | 10 (6.4%) | | |
| | Postgraduate education | 20 (66.7%) | 3 (10%) | 3 (10%) | 3 (10%) | 1 (3.3%) | | |
| Marital status | Single | 35 (24.6%) | 41 (28.9%) | 30 (21.1%) | 26 (18.3%) | 10 (7%) | 11.7 | 0.020 |
| | Married | 39 (44.3%) | 20 (22.7%) | 18 (20.5%) | 8 (9.1%) | 3 (3.4%) | | |
| Offspring | No | 53 (30.3%) | 44 (25.1%) | 33 (18.9%) | 32 (18.3%) | 13 (7.4%) | 12.9 | 0.012 |
| | Yes | 21 (38.2%) | 17 (30.9%) | 15 (27.3%) | 2 (3.6%) | 0 (0%) | | |
| Smoking status | No | 63 (36.6%) | 35 (20.3%) | 36 (20.9%) | 28 (16.3%) | 10 (5.8%) | 19.4 | 0.013 |
| | Yes | 6 (14.6%) | 17 (41.5%) | 9 (22%) | 6 (14.6%) | 3 (7.3%) | | |
| | Ex-smoker | 5 (29.4%) | 9 (52.9%) | 3 (17.6%) | 0 (0%) | 0 (0%) | | |
| Exercise | No | 12 (21.8%) | 15 (27.3%) | 11 (20%) | 12 (21.8%) | 5 (9.1%) | 16.4 | 0.038 |
| | Sometimes | 43 (31.6%) | 33 (24.3%) | 33 (24.3%) | 21 (15.4%) | 6 (4.4%) | | |
| | Yes, regularly | 19 (48.7%) | 13 (33.3%) | 4 (10.3%) | 1 (2.6%) | 2 (5.1%) | | |
| Family member on therapy for psychiatric illness | No | 71 (35.1%) | 49 (24.3%) | 42 (20.8%) | 31 (15.3%) | 9 (4.5%) | 12.4 | 0.015 |
| | Yes | 3 (10.7%) | 12 (42.9%) | 6 (21.4%) | 3 (10.7%) | 4 (14.3%) | | |
| Chronic | No | 70 (34%) | 54 (26.2%) | 40 (19.4%) | 33 (16%) | 9 (4.4%) | 11.9 | 0.018 |

| | | | | | | | | |
|--------------------------------|--------------|------------|------------|------------|------------|-----------|------|-------|
| diseases (DM, HTN, BA, etc...) | Yes | 4 (16.7%) | 7 (29.2%) | 8 (33.3%) | 1 (4.2%) | 4 (16.7%) | | |
| Duration of acne, y | 1 to 5 | 31 (36.5%) | 18 (21.2%) | 19 (22.4%) | 14 (16.5%) | 3 (3.5%) | 9.1 | 0.334 |
| | 6 to 10 | 20 (25.6%) | 20 (25.6%) | 17 (21.8%) | 14 (17.9%) | 7 (9%) | | |
| | 11 to 15 | 23 (34.3%) | 23 (34.3%) | 12 (17.9%) | 6 (9%) | 3 (4.5%) | | |
| Type of acne therapy used | Oral | 2 (50%) | 0 (0%) | 2 (50%) | 0 (0%) | 0 (0%) | 39.5 | 0.000 |
| | Local | 35 (44.3%) | 14 (17.7%) | 6 (7.6%) | 21 (26.6%) | 3 (3.8%) | | |
| | Both | 5 (21.7%) | 4 (17.4%) | 8 (34.8%) | 4 (17.4%) | 2 (8.7%) | | |
| | No treatment | 32 (25.8%) | 43 (34.7%) | 32 (25.8%) | 9 (7.3%) | 8 (6.5%) | | |
| Severity of acne | Mild | 46 (33.8%) | 39 (28.7%) | 35 (25.7%) | 10 (7.4%) | 6 (4.4%) | 37.0 | 0.000 |
| | Moderate | 23 (28.4%) | 22 (27.2%) | 11 (13.6%) | 22 (27.2%) | 3 (3.7%) | | |
| | Severe | 5 (38.5%) | 0 (0%) | 2 (15.4%) | 2 (15.4%) | 4 (30.8%) | | |

DISCUSSION:

Acne vulgaris is a prevalent skin condition that affects almost 80% of adolescents and young adults between the ages of 11 and 30. ⁽²⁵⁾ The overall rates, especially among adults, appear to be rising. ⁽²⁶⁾ Acne was previously thought to be a hormone-fueled adolescent illness, but it is now known to afflict people of all ages.

This study aims to find the possible association between acne vulgaris and depression and factors affecting that association in Taif city, KSA.

The prevalence of depression among subjects with acne vulgaris in Taif, KSA is 41.4%.

In terms of acne-related variables, the severity of acne was strongly linked to the severity of depression ($P=0.000$), with severe depression being present in 4.4%, 3.7%, and 30.8% of participants having mild, moderate, and severe acne, respectively.

In addition to severity, the kind of acne treatment was linked with depression severity, with participants receiving oral, or oral and topical treatment having more severe depression types than those who did not get treatment ($P=0.000$).

This prevalence reported in our study is higher than that reported in the study of Mleeh *et al.*, conducted in Jeddah, as the authors assessed in a cross-sectional survey the prevalence of depression among 273 patients with dermatological conditions, including acne vulgaris using the PHQ-9. The study found that depression among acne patients was the second commonest one after psoriasis with a prevalence of 30.2%.⁽¹³⁾

Another study conducted in Makkah by Al-Huzali *et al.* to determine the prevalence of depression and its determinants among acne patients who attended dermatology clinic using the Arabic version of Beck Depression Inventory questionnaire (BDI) to assess depression. Depression, regardless its severity was reported among 40.8% of acne patients; severe depression was reported by 12.3% of them while mild and moderate depressions were reported by 16.2% and 12.3%, respectively. Extremely severe depression was not reported among any of acne patients, and similar to our findings, age, gender and severity of acne were significant determinants of depression.⁽¹⁴⁾

Although duration of acne was not significantly associated with depression severity, moderately severe depression rates were higher among subjects with shorter duration of acne diagnosis ($P=0.334$). In a case-control study, Vallerand *et al.* (2018) investigated the association between acne and an increased risk of developing Major depressive disorder (MDD). They found that the risk of getting MDD was 18.5% among acne patients and 12% among non-acne patients throughout a 15-year period of follow-up, with the risk being highest within one year of acne diagnosis (adjusted odds ratio "OR" 1.6, 95 percent confidence interval "CI" 1.3–2).⁽¹⁵⁾

Bashir *et al.* (2010) conducted a cross-sectional study to assess the prevalence of depression among adult male dermatological patients. For depression diagnosis, they utilised the Urdu version of the General Health Questionnaire-12 (GHQ-12). Depression was found to be prevalent in 34.1% of individuals with dermatological symptoms, whereas it was prevalent in 57.5% of acne vulgaris patients.

Depression was two to three times more common in acne patients than in the general population as per a study conducted in North Carolina, USA, with 8.8% of acne patients reporting clinical depression. The majority of instances of depression were found in acne patients aged 18 and above, with the 36-64 age group having the largest incidence.

In contrast to our findings, Duman *et al.* conducted a case-control study in Turkey (2016) to measure anxiety and depression risk in acne vulgaris patients and to investigate the influence of acne vulgaris on the patients' and their families' quality of life. To measure depression, the Hospital Anxiety and Depression Scale (HAD) was used. The HAD anxiety subscale (HAD-A) and HAD depression subscale (HAD-D) scores did not differ significantly between the acne and control groups.⁽¹⁸⁾

Conclusion and recommendations

The prevalence of depression among subjects with acne vulgaris in Taif, KSA is 41.4%.

The severity of acne was strongly associated to the severity of depression, as well as the type of acne treatment was linked with depression severity, with participants receiving oral, or oral and topical treatment having more severe depression types than those who did not get treatment. We recommend future studies to include a larger sample size and more accurate diagnostic tools for acne and depression.

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