# Obsessive–compulsive symptoms and quality of life in patients with acne vulgaris

Adel A. Ibrahim[a], Fatma M. El-Esawy[a], Sherine H. AbdEl-Rahman[a], Shorouk F. Abd-Elmaksoud[b]

Departments of [a]Dermatology, Venereology and Andrology, [b]Psychiatric, Faculty of Medicine, Benha University, Benha, Egypt

Correspondence to Shorouk F. Abd-Elmaksoud, MD Psychiatry, Lecturer of Psychiatry, Department of Psychiatric, Faculty of Medicine, Benha University, Benha, Egypt.
e-mail: drshoroukfathiis@yahoo.com

## Objective or Background

Acne is the most common problem that presents to dermatologists. Because it causes visible disfiguring of the face, it produces a great deal of embarrassment, frustration, anger, and depression in patients. Acne can produce anxiety, depression, and other psychiatric symptoms that affect patients' lives. Obsessive–compulsive disorder is one of the most frequent psychiatric disorders expected to be comorbid with acne vulgaris.

The aim of the study was to detect obsessive–compulsive symptoms and quality of life (QOL) in patients with acne vulgaris and to compare the results with the results of healthy controls.

## Patients and methods

In a cross-sectional design study, 150 patients diagnosed with acne vulgaris and 50 apparently healthy participants were subjected to Global Acne Grading System, Maudsley Obsessive–Compulsive Questionnaire, Short Form-36, and Hospital Anxiety and Depression Scale.

## Results

Patients with acne vulgaris had higher Maudsley Obsessive–Compulsive Questionnaire scores for checking and slowness than the healthy controls. In terms of QOL, they showed significantly lower scores for physical functioning, physical role difficulty, general health perception, vitality, and emotional role difficulty than the controls. Both groups were similar in terms of Hospital Anxiety and Depression Scale subscores and total score.

## Conclusion

Obsessive–compulsive symptoms are more severe in patients with acne vulgaris than in healthy participants and are negatively correlated with QOL. The presence of these and other comorbid psychiatric disorders should be considered in the treatment of patients with acne to provide better health care, referral, and management.

## Keywords:

acne excoriée, acne vulgaris, obsessive–compulsive symptoms, quality of life

## Introduction

Acne vulgaris is a multifactorial, spontaneously resolving pleomorphic skin disease, characterized by a variety of noninflamed and inflamed skin lesions (Wilcox et al., 2007).

Acne is most common during adolescence and young adulthood, a time when patients are least capable of coping with additional stress (Saitta et al., 2011).

There are five general ways in which acne and the psychiatry interact: (a) acne can cause mental disturbances, such as anger, depression, and frustration; (b) acne may worsen emotional factors in a patient's life; (c) acne lesions can be a manifestation of mental disorders; (d) acne can decrease a patient's psychological functioning and quality of life (QOL); and (e) acne medications may have psychiatric adverse effects (Bowe et al., 2007).

Anxiety, impaired QOL, depression, and low self-esteem have been reported in patients with acne vulgaris (Mallon et al., 1999; Bez et al., 2011).

Obsessive–compulsive disorder (OCD) has been nosologically separated from anxiety disorders and classified under the section of obsessive–compulsive and related disorders in the DSM-5 (American Psychiatric Publishing, 2013) and ICD-11 (Stein et al., 2016). Commonly described disorders in this

category include OCD, body dysmorphic disorder, body-focused repetitive behaviors (i.e. trichotillomania and skin-picking disorder), and hoarding disorder.

A compulsive urge to manipulate the skin has been reported in patients with acne excoriée (Bach and Bach, 1993).

Acne excoriée is characterized by excessive scratching of normal skin or skin with minor surface irregularities. Patients with psychogenic excoriations frequently have other psychiatric disorders (Arnold *et al.*, 2001). It is the most common factitial skin disease of adulthood (Shah and Fried, 2006).

In addition to compulsion to excoriate among patients with acne, they may also have obsessive thoughts about the oiliness of their faces (Arnold *et al.*, 1998).

OCD is a chronic and often disabling condition that causes deficit in social functioning (SF) and QOL (Tenny *et al.*, 2003). QOL deficits were not only restricted to emotional and social aspects but also extended to somatic domains (Moritz *et al.*, 2005).

The psychosocial effects of acne are dissatisfaction with appearance, embarrassment, and lack of self-confidence and social dysfunction, including social interaction especially with opposite sex, social appearance, social interaction with strangers, and decrease opportunities for employment. Acne is associated with the feeling of anxiety, anger, and depression, with poor intention to participate in sports and activities (Fahmida *et al.*, 2019).

High-risk patients have impaired basic interpersonal skills and disrupted family lives. There may be a concomitant change in peer groups and a decrease in academic functioning. High-risk patients often engage in limited conversation with poor eye contact. They may show anger, irritability, depression, agitation, anxiety, or compulsive behaviors (Dalgard *et al.*, 2008).

The aims of the study were to find out obsessive–compulsive symptoms and QOL in patients with acne vulgaris and to compare the results with the results of healthy controls.

## Patients and methods
### Patients
In a cross-sectional study, among the patients from outpatient clinic of Dermatology and Andrology Department of Benha University Hospital, 150 patients diagnosed with acne vulgaris and aged over 15 years, educated to at least primary school level, not taking any medication for acne since 3 months, and accepted to participate in the study were included in the study. All procedures were revised and approved by Research Ethics Committee at Benha Faculty of Medicine, all cases were informed about the study and signed a consent form.

Patients were excluded if they had any other dermatological disorders, history of medical diseases that might cause psychological distress, or had any other psychiatric disorders.

In addition, 50 apparently healthy controls, who were age and sex matched closely with the patients with acne, who had no dermatological or psychiatric symptoms, and who gave informed consent to participate were included as well.

### Data collection
The following were the data collection tools:

Semistructured interview and demographic data, which included age, sex, educational level, and marital status.

Global Acne Grading System (GAGS): the GAGS is a quantitative scoring system to assess acne severity (Doshi *et al.*, 1997).

Maudsley Obsessive–Compulsive Questionnaire (MOCQ): it is used for assessing the obsessive and compulsive symptoms in psychiatric patients and as a screening tool in other populations. The original questionnaire comprises 30 yes/no choice questions and provides four subscale scores, including checking, cleaning, slowness, and doubting (Hodgson and Rachman, 1977).

Short Form-36 (SF-36): the SF-36 is the most widely used self-report scale to measure health-related QOL. It successfully measures patients with medical or psychological disorders as well as healthy participants (Ware and Sherbourne, 1992). It provides scores ranging between 0 and 100, which indicate QOL in eight dimensions of health [physical functioning (PF), physical role (RP) difficulty, bodily pain (BP), general health (GH) perception, vitality (VT), SF, emotional role (RE) difficulty, and mental health (MH)]. Higher scores reflect a better QOL.

Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983): it consists of 14

questions with multiple choices. It provides two subscores (anxiety and depression) and a total score. It is accepted as a reliable screening instrument for clinically significant anxiety and depression and is a valid measure of the severity of these disorders (Bjelland *et al.*, 2002).

### Statistical analysis

The clinical and laboratory data were recorded on an 'investigation report form.' These data were tabulated, coded, and then analyzed using the computer program SPSS (Statistical package for social science) version 16 to obtain the following:

(1) Descriptive data: descriptive statistics were calculated for the data in the form of mean and SD.
(2) Analytical statistics: in the statistical comparison between the different groups, the significance of difference was tested using one of the following tests:
   (a) Student *t*-test: it is used to compare between the means of two groups of numerical (parametric) data.
   (b) Pearson correlation coefficient test was used to correlate different parameters.
   (c) Intergroup comparison of categorical data was performed by using $\chi^2$ test ($\chi^2$ value),

A *P* value less than 0.05 was considered statistically significant and a *P* value less than 0.0001 was considered highly significant in all analyses.

### Result

This study included 150 patients with acne vulgaris, comprising 122 (81.3%) females and 28 (18.7%) males. Their age ranged between 15 and 31 years, and the mean age was 21.12±4.58 years. In this group, 36.7% were married and 63.3% were unmarried. Their educational level were 33.3% had primary level of education, 30.7% had secondary level of education, and 36% were university graduated. The duration of acne was in 62% of the patients less than 20 months, in 19.3% of the patients with rang between 20 and 40 months, and in 18.7% of the patients more than 40 months; the mean duration of acne was 22.51±24.63 months. Mean acne severity, detected by GAGS, was 17.65±7.19; half (50%) of the patients according to GAGS had mild acne, 44% had moderate acne, and only 6% had severe acne vulgaris.

The control group included 50 healthy participants, comprising 39 (78.0%) females and 11 (22%) males. Their age ranged between 15 and 33 years, with a mean age of 23.42±5.28 years. In the control group, 44% married and 56% unmarried. Regarding the level of

education, for control group, 28% had primary level of education, 18% had secondary level of education, and 27% were university graduated.

The results of psychiatric measurements (MOCQ and HADS) and health-related QOL (SF-36) of patients with acne and control group. Regarding to MOCQ scores, patients with acne had higher scores for checking, slowness, and total score. There were statistically significant differences regarding checking (*P*=0.010), slowness (*P*=0.001), and total score (*P*=0.001). On the contrary, there were no statistically significant differences between patients with acne and control group regarding cleanliness (*P*=0.416) and doubting (*P*=0.283) (Table 1).

A comparison was done between patients with acne and control group regarding SF-36, and patients with acne had lower scores for PF, RP, GH, VT, and RE. There were statistically significant differences between patients with acne and control group regarding PF (*P*=0.047), RP (*P*=0.042), GH (*P*=0.023), VT (*P*=0.010), and RE (*P*=0.032). On the contrary, there were no statistically significant differences between patient and control groups regarding BP (*P*=0.063), SF (*P*=0.096), and MH (*P*=0.714) (Table 2).

There were no statistically significant differences between both groups regarding anxiety and depression scores on the HADS, with *P* values of 0.605 and 0.748, respectively.

A correlation was done between acne duration and severity, obsessive–compulsive symptoms, and health-related QOL dimensions in patients with acne vulgaris. There was a significant negative correlation between the duration and severity of acne (*P*< 0.001) (*r*=-0.372). Significant negative correlations were also present between GH perception dimension and slowness (*P*< 0.001) (*r*=0.461), VT dimension, and both slowness (*P*< 0.001) (*r*=-0.418) and doubting (*P*< 0.001) (*r*=0.346). RP negatively and significantly correlated with checking (*P*< 0.001) (*r*=0.451), slowness (*P*< 0.001) (*r*=-0.364), and doubting (*P*< 0.001) (*r*=-0.267). Negative correlations were seen between acne severity and PF, RP, BP, and VT dimension of SF-36 (*r*=-0.001, -0.106, -0.147, and -0.074, respectively). Significant negative correlations were also present between acne duration and cleaning scores in MOCQ (*P*< 0.001) (*r*=-0.326).

There were significant negative correlations between acne duration and each of PF (*P*? 0.05) (*r*=-0.180), MH (*P*< 0.05) (*r*=0.192), RE (*P*< 0.05) (*r*=-0.184),

**Table 1 Comparison between patients with acne and control group according to Maudsley Obsessive–Compulsive Questionnaire score**

| MOCQ score | Patients (N=150) | Control (N=50) | Z | P |
|---|---|---|---|---|
| Checking | | | | |
| Minimum–maximum | 0.0–6.0 | 0.0–5.0 | 2.587[*] | 0.010[*] |
| Mean±SD | 2.54±1.65 | 1.84±1.58 | | |
| Median | 3.0 | 2.0 | | |
| Cleaning | | | | |
| Minimum–maximum | 0.0–10.0 | 0.0–5.0 | 0.814 | 0.416 |
| Mean±SD | 2.70±1.69 | 2.40±1.48 | | |
| Median | 3.0 | 2.0 | | |
| Slowness | | | | |
| Minimum–maximum | 0.0–5.0 | 0.0–4.0 | 3.681[*] | <0.001[*] |
| Mean±SD | 2.01±1.50 | 1.10±1.27 | | |
| Median | 2.0 | 1.0 | | |
| Doubting | | | | |
| Minimum–maximum | 0.0–6.0 | 0.0–4.0 | 1.074 | 0.283 |
| Mean±SD | 1.27±1.20 | 1.08±1.18 | | |
| Median | 1.0 | 1.0 | | |
| Total | | | | |
| Minimum–maximum | 0.0–16.0 | 0.0–12.0 | 3.200[*] | 0.001[*] |
| Mean±SD | 7.93±3.77 | 5.98±3.16 | | |
| Median | 8.0 | 6.0 | | |

MOCQ, Maudsley Obsessive–Compulsive Questionnaire; Z, Z for Mann–Whitney test. A comparison was done between patients with acne and control group regarding MOCQ scores. Patients with acne had higher scores for checking, slowness, and total score. There were statistically significant differences regarding checking (P=0.010), slowness (P=0.001), and total score (P=0.001). On the contrary, there were no statistically significant differences between patients with acne and control group regarding cleanliness (P=0.416) and doubting (P=0.283). [*]Statistically significant at P value less than or equal to 0.05.

VT dimension ($P< 0.001$) ($r=-0.332$), SF ($P=0.001$) ($r=-0.281$), and GH perception ($P< 0.05$) ($r=-0.182$) of SF-36 scores in the patient group (Table 3).

## Discussion

Acne vulgaris is a common inflammatory skin condition. Nearly 90% of teenagers have acne, and half of them continue to experience symptoms as adults (Yentzer *et al.*, 2010). Many studies have shown an association between acne and depression and anxiety (Dunn *et al.*, 2011).

OCD is a common neuropsychiatric disorder characterized by the presence of obsessions and/or compulsions that are time consuming and cause distress or interference in the patient's life (American Psychiatric Association, 2013).

The incidence of OCD has two peaks with different sex distributions: the first peak is in childhood, with symptoms mostly arising between 7 and 12 years of age and a male preponderance, and the second peak occurs in early adulthood, at a mean age of 21 years and with a slight female majority (Geller *et al.*, 2003).

Obsessive–compulsive symptoms vary considerably not only from patient to patient but also in the same patient

over time. Patients with OCD might feel driven to repeat compulsions until they experience a sense of relief from these uncomfortable sensations (Rosario *et al.*, 2009).

This study included 150 patients with acne vulgaris, comprising 122 (81.3%) females and 28 (18.7%) males, and their age ranged between 15 and 31 years, with a mean age of 21.12±4.58 years. In this group, 36.7% were married and 63.3% were unmarried, which is same as the study by Fahmida *et al.* (2019), which found psychiatric comorbidity was more common among unmarried (single or divorced), as the married people feel more secure and have a stable life (Abolfotouh *et al.*, 2012).

The current study reported that patients with acne vulgaris had higher MOCQ scores for checking, slowness, and total score than controls, with statistically significant differences.

Checking was commonly in the form of frequent checking of their faces if there was any new lesions, as the patients' content of thought is preoccupation with their skin, and frequent washing of their faces because of worrying about oily appearance and frequent picking of the lesions and slowness, which was

**Table 2 Comparison between patients with acne and control group according to Short Form-36**

| SF-36 | Patients (N=150) | Control (N=50) | Test of significance | P |
|---|---|---|---|---|
| Physical function | | | | |
| Minimum–maximum | 20.0–100.0 | 50.0–100.0 | Z=1.986[*] | 0.047[*] |
| Mean±SD | 74.43±20.06 | 80.88±18.11 | | |
| Median | 77.50 | 80.0 | | |
| Physical role | | | | |
| Minimum–maximum | 0.0–100.0 | 10.0–100.0 | Z=2.035[*] | 0.042[*] |
| Mean±SD | 62.09±30.53 | 71.17±28.53 | | |
| Median | 75.0 | 80.0 | | |
| Bodily pain | | | | |
| Minimum–maximum | 25.0–100.0 | 32.0–100.0 | t=1.869 | 0.063 |
| Mean±SD | 69.04±21.08 | 75.25±18.03 | | |
| Median | 72.0 | 74.0 | | |
| General health | | | | |
| Minimum–maximum | 12.50–92.0 | 48.50–92.0 | t=2.291[*] | 0.023[*] |
| Mean±SD | 65.76±16.24 | 71.60±13.52 | | |
| Median | 67.0 | 72.0 | | |
| Vitality | | | | |
| Minimum | 30.0–100.0 | 35.0–95.0 | t=2.636[*] | 0.010[*] |
| Mean±SD | 66.89±14.45 | 74.20±17.74 | | |
| Median | 70.0 | 80.0 | | |
| Social function | | | | |
| Minimum–maximum | 0.0–100.0 | 12.50–87.50 | Z=1.663 | 0.096 |
| Mean±SD | 61.72±21.70 | 66.54±22.12 | | |
| Median | 62.50 | 75.0 | | |
| Emotional role | | | | |
| Minimum–maximum | 0.0–100.0 | 10.0–100.0 | Z=2.149[*] | 0.032[*] |
| Mean±SD | 60.28±34.29 | 68.37±36.28 | | |
| Median | 66.70 | 76.70 | | |
| Mental health | | | | |
| Minimum–maximum | 20.0–90.0 | 20.0–84.0 | Z=0.367 | 0.714 |
| Mean±SD | 66.73±15.13 | 66.64±16.65 | | |
| Median | 68.0 | 72.0 | | |

SF-36, Short Form-36; t, Student t-test; Z, Z for Mann–Whitney test. A comparison was done between patients with acne and control group regarding to SF-36. Patients with acne had lower scores for physical function, physical role, general health, vitality, and emotional role. There were statistically significant differences between patients with acne and control group regarding physical function (P=0.047), physical role (P=0.042), general health (P=0.023), vitality (P=0.010), and emotional role (P=0.032). On the contrary, there were no statistically significant differences between patient and control groups regarding bodily pain (P=0.063), social function (P=0.096), and mental health (P=0.714). *Statistically significant at P value less than or equal to 0.05.

commonly in the form of spending a lot of time in washing and how to hide the lesions.

In addition, a lot of patients worry of having a disfiguring skin, as acne vulgaris may lead to having compulsive thoughts to pick and scratch skin, either normal skin, skin with minimal texture irregularities, or to excoriate acne (Lee et al., 2008). This is shown in our study, as there was a negative correlation between duration of acne and cleaning score in MOCQ.

This result was in agreement with a study conducted by Bez et al. (2013), which aimed to measure obsessive–compulsive symptoms in patients with acne vulgaris, compared with healthy controls, using MOCQ. They found that patients with acne vulgaris had significantly higher MOCQ scores for checking

(P=0.01), slowness (P=0.01), and rumination (P=0.01) than the healthy controls. In accordance to the present study, Ünsalver et al. (2012) observed that there was an increased prevalence of both OCD and other DSM-IV axis I disorders among dermatology patients, especially those with acne vulgaris. The most common obsession was found to be contamination (63.6%), ordering (22.7%), and symmetry (18.1%). Most frequent compulsions were found to be washing/cleaning (63.6%), checking (40.9%), and counting (31.8%).

Moreover, Afkham et al. (2007) investigated the frequency of OCD in a group of dermatology outpatients using Yale–Brown Obsessive–Compulsive Scale. Of 144 patients, 20 (14%) patients qualified for a diagnosis of OCD. Somatic obsessions and washing

**Table 3 Correlation between acne duration of disease, Global Acne Grading System, Maudsley Obsessive–Compulsive Questionnaire score, Short Form-36, and Hospital Anxiety and Depression Scale in patients with acne**

| | | Acne grading system | Total | Checking | Cleaning | Slowness | Doubting | PF | RP | BP | GH | VT | SF | RE | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Duration of disease | r | -0.372* | 0.023 | 0.043 | -0.326* | 0.210* | 0.274* | -0.180* | -0.140 | -0.067 | -0.182* | -0.332* | -0.281* | -0.184* | -0.192* |
| | P | <0.001 | 0.785 | 0.599 | <0.001 | 0.010 | 0.001 | 0.028 | 0.088 | 0.415 | 0.025 | <0.001 | 0.001 | 0.024 | 0.019 |
| Acne grading system | r | | 0.294* | 0.174* | 0.440* | 0.013 | 0.058 | -0.001 | -0.106 | -0.147 | 0.050 | -0.074 | 0.142 | 0.121 | 0.098 |
| | P | | <0.001 | 0.033 | <0.001 | 0.872 | 0.483 | 0.992 | 0.196 | 0.073 | 0.541 | 0.366 | 0.083 | 0.139 | 0.231 |
| Total | r | | | 0.807* | 0.447* | 0.713* | 0.619* | 0.484* | 0.368* | 0.634* | 0.485* | 0.464* | 0.435* | -0.106 | 0.369* |
| | P | | | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.196 | <0.001 |
| Checking | r | | | | 0.076 | 0.671* | 0.393* | 0.576* | -0.451* | 0.654* | 0.489* | 0.474* | 0.500* | -0.111 | 0.362* |
| | P | | | | 0.358 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.175 | <0.001 |
| Cleaning | r | | | | | -0.087 | 0.060 | 0.021 | 0.030 | 0.083 | 0.035 | -0.033 | 0.038 | -0.011 | 0.008 |
| | P | | | | | 0.292 | 0.463 | 0.803 | 0.713 | 0.315 | 0.675 | 0.692 | 0.642 | 0.897 | 0.927 |
| Slowness | r | | | | | | 0.360* | 0.555* | -0.364* | 0.530* | -0.461* | -0.418* | 0.446* | -0.070 | 0.306* |
| | P | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.393 | <0.001 |
| Doubting | r | | | | | | | 0.260* | -0.267* | 0.466* | 0.381* | -0.346* | -0.382* | -0.105 | -0.418* |
| | P | | | | | | | 0.001 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.199 | <0.001 |
| PF | r | | | | | | | | 0.446* | 0.524* | 0.475* | 0.446* | 0.543* | 0.205* | 0.479* |
| | P | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.012 | <0.001 |
| RP | r | | | | | | | | | 0.450* | 0.367* | 0.390* | 0.362* | 0.143 | 0.386* |
| | P | | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 | 0.081 | <0.001 |
| BP | r | | | | | | | | | | 0.486* | 0.457* | 0.418* | 0.220* | 0.563* |
| | P | | | | | | | | | | <0.001 | <0.001 | <0.001 | 0.007 | <0.001 |
| GH | r | | | | | | | | | | | 0.396* | 0.426* | 0.261* | 0.450* |
| | P | | | | | | | | | | | <0.001 | <0.001 | <0.001 | <0.001 |
| VT | r | | | | | | | | | | | | 0.409* | 0.265* | 0.336* |
| | P | | | | | | | | | | | | <0.001 | 0.001 | <0.001 |
| SF | | | | | | | | | | | | | | | |

*(Continued)*

**Table3** *(Continued)*

| Acne grading system | Total | Checking | Cleaning | Slowness | Doubting | PF | RP | BP | GH | VT | SF | RE | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| r | | | | | | | | | | | | 0.205* | 0.338* |
| P | | | | | | | | | | | | 0.012 | <0.001 |
| RE | | | | | | | | | | | | | |
| r | | | | | | | | | | | | | 0.189* |
| P | | | | | | | | | | | | | 0.021 |
| MH | | | | | | | | | | | | | |
| r | | | | | | | | | | | | | |
| P | | | | | | | | | | | | | |

BP, bodily pain; GH, general health; MH, mental health; MOCQ, Maudsley Obsessive–Compulsive Questionnaire; PF, physical function; r, Pearson coefficient; RE, emotional role; RP, Physical Role; SF, social function; SF-36, Short Form-36; QOL, quality of life; VT, vitality. Correlations were done between acne duration and severity, levels of obsessive–compulsive symptoms, and health-related QOL dimensions in patients with acne vulgaris. There was a significant negative correlation between the duration and severity of acne ($P?$ 0.001) ($r$=−0.372). Significant negative correlations were also present between general health perception dimension and slowness ($P?$ 0.001) ($r$=−0.461), vitality dimension, and both slowness ($P?$ 0.001) ($r$=−0.418) and doubting ($P?$ 0.001) ($r$=−0.346). Physical role negatively and significantly correlated with checking ($P?$ 0.001) ($r$=−0.451), slowness ($P?$ 0.001) ($r$=−0.364), and doubting ($P?$ 0.001) ($r$=−0.267). There were negative correlations between acne severity and PF, RP, BP, and VT of SF-36 ($r$=−0.001, −0.106, −0.147, and −0.074, respectively). There was a significant negative correlation between acne duration and cleaning scores in MOCQ ($P?$ 0.001) ($r$=−0.326). There were significant negative correlations between acne duration and each of PF ($P?$ 0.05) ($r$=−0.180), MH ($P?$ 0.05) ($r$=−0.192), RE ($P?$ 0.05) ($r$=−0.184), VT ($P?$ 0.001) ($r$=−0.332), SF ($P$=0.001) ($r$=−0.281), and GH ($P?$ 0.05) ($r$=−0.182) of SF-36 scores in patient group. *Statistically significant at $P$ value less than or equal to 0.05.

compulsions were the most reported symptoms. Most OCD-positive patients had acne. It was concluded that the frequency of OCD in the dermatology population may be four to five times higher than in the general population.

Some recent molecular studies have reported the involvement of cytokines and corticotropin-releasing hormone in acne pathophysiology, and these also play a role in some psychiatric disorders, such as anxiety and depression (Elewa *et al.*, 2012).

On assessing QOL in patients with acne according to SF-36, the current study showed that patients with acne had significantly lower scores for PF ($P$=0.047), RP difficulty ($P$=0.042), GH perception ($P$=0.023), VT ($P$=0.010), and RE difficulty ($P$=0.032) than the controls.

This was in agreement with the study conducted by Öztürk *et al.*(2013), which aimed to investigate the psychiatric characteristics of acne vulgaris and the effects of the disease on QOL using SF-36 and showed no significant differences found between acne and control groups apart from SF-36 scores of VT ($P$<0.05), SF ($P$<0.05), and RE difficulties ($P$<0.05). Lower scores related to domains of VT, SF, and RE difficulties were detected in the acne group.

Another study by Ghaderi *et al.* (2013) reported that acne vulgaris is a common skin disease that can adversely affect the QOL of patients using SF-36 and Dermatology Life Quality Index (DLQI). They found that the scores for PF, SF, and BP domains in patients were more than 70%, but the scores for role RP, GH, VT, RE, and MH in patients were less than 70%. Acne vulgaris has a significant effect on the QOL.

Moreover, Ghaderi *et al.*(2013) aimed to measure obsessive–compulsive symptoms and QOL in patients with acne vulgaris using SF-36, whose results were compared with those of healthy controls. Patients with acne vulgaris had lower scores for PF ($P$=0.03), RP dysfunction ($P$=0.03), GH perception ($P$=0.01), and RE dysfunction ($P$=0.03) compared with controls.

Correlations were done between acne duration and severity, levels of obsessive–compulsive symptoms, and SF-36 dimensions in patients with acne vulgaris. There was a significant negative correlation between the duration and severity of acne.

Regarding the relationship between duration and severity of acne and QOL, there were negative correlations between severity of acne and PF, RP dysfunction, BP, and VT dimension of SF-36 ($r$=-0.001, -0.106, -0.147, and -0.074, respectively). Negative significant correlations were also present between GH perception dimension and slowness, VT dimension, and both slowness and doubting. On the contrary, RP negatively and significantly correlated with checking, slowness, and doubting.

This was in accordance with the study by El-Maadawy *et al.* (2014), which aimed to determine the effect of some chronic dermatoses, including acne vulgaris, psoriasis, and vitiligo on QOL among the patients in the Delta region using Hayashi grading for acne severity and for QOL. They reported that the social relationships and psychological states problems showed statistically significant difference ($P$? 0.05) compared with the subjective assessment of the current acne severity, so the effect on QOL increased with the facial acne severity.

On the contrary, Ilgen and Derya (2005) found that the QOL of patients with acne can be affected by reasons other than acne severity and presence of scars. The reasons can be social, personal, emotional, and school-related problems of the patients. They observed that there were no significant relationships ($P$? 0.05) between acne severity and Acne Quality of Life Scale/DLQI. Moreover, no statistically significant correlation was found between the patients with acne with scars and those without scars with respect to Acne Quality of Life Scale and DLQI scores.

Regarding HADS scores in the present study, a comparison was done between patient and control groups. There were no statistically significant differences between patient and control groups regarding anxiety and depression scores, with $P$ values of 0.605 and 0.748, respectively.

In the acne vulgaris patient group, there was no sex difference in terms of anxiety, depression, QOL dimensions, and obsessive–compulsive symptoms.

In agreement with our result, Bez *et al.* (2013) reported that there were no statistically significant differences between patients with acne and control group regarding anxiety and depression scores using HADS.

On the contrary, Öztürk *et al.* (2013) found that anxiety and depression scores of the patients with acne were significantly higher than those of the control group ($P$=0.01), using HADS.

To conclude, OCD is more severe in patients with acne vulgaris and is negatively correlated with QOL. Presence of acne can negatively affect QOL, self-esteem, and mood and is associated with an increased incidence of anxiety, depression, and suicidal ideation.. The presence of these and other comorbid psychiatric disorders should be considered in the treatment of patients with acne when appropriate.

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### Conflicts of interest
There are no conflicts of interest.

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