

## PREVALENCE OF DEPRESSION AMONG ACNE PATIENTS IN KING FAISAL HOSPITAL AND KING ABULAZIZ HOSPITAL IN MAKKAH, SAUDI ARABIA

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### ABSTRACT

**Background:** Acne vulgaris remains the most commonly skin disease treated by physicians with prevalence reaching up to 80% during adolescence. There is no single disease which causes more psychic trauma, more general insecurity and feelings of inferiority and greater sums of psychic assessment than does acne vulgaris.

**Aims & Objectives:** To determine the prevalence of depression and its associated factors among acne patients in king Faisal and king Abdul-Aziz hospital in Makkah, 2011.

**Materials and Methods:** A cross sectional study included Acne patients, who attended dermatology clinic in both of King Faisal and King Abdul-Aziz hospitals in makkah during the study period (July, 2011). The diagnosis of acne included presence of white head comedon and black head comedon, papule, pustule, pseudocyst and scar. A self-administered questionnaire was used for data collection. It is consist of three parts: demographic data, the Arabic version of Beck Depression Inventory questionnaire (BDI) and associated factor such as family history of depression, stressful event in the last month and acne treatment modality.

**Results:** The study included 228 acne patients. Their age ranged between 14 and 39 years with a mean of  $23.9 \pm 5.7$  years. More than half of the participants were females (56.1%). Depression, regardless its severity, reported among 40.8% of acne patients. A severe depression was reported by 12.3% of acne patients 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. Age, gender and severity of acne were significantly associated with depression.

**Conclusion:** This study points to mental problems as an important factor in acne, but the causal relationship remains elusive.

**Key Words:** Acne; Depression, Beck Depression Inventory Scale; Saudi Arabia

### Introduction

Adult dermatological out patients have a 40% prevalence of psychiatric co-morbidity. If psychiatric co-morbidity is unrecognized, undetected and untreated, the consequences may be fatal. Acne is the most common skin disorder of the second and third decades of life.<sup>[1]</sup>

Acne vulgaris remains the most commonly skin disease treated by physicians with prevalence reaching up to 80% during adolescence.<sup>[2]</sup> It is a disease of the pilosebaceous units, clinically characterized by seborrhea, comedones, papules, pustules, nodules and, in some cases, scarring. Although it's easy to diagnose.<sup>[3]</sup>

The psychological effect of acne on patients can be considerable. The interaction of acne and psychosocial issues is complex and, in adolescence, can be associated with developmental issues of body image, socialization and sexuality. Previous studies on the psychosocial impact of acne have documented dissatisfaction with appearance, embarrassment, self-consciousness, and lack of self-confidence in acne patients. 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.<sup>[4]</sup> Furthermore, acne is associated with anxiety, depression<sup>[5]</sup>, feel of anger<sup>[6]</sup> and lower body satisfaction<sup>[7]</sup>. It can be negatively associated with intention to participate in sports and exercise.<sup>[8]</sup>

Although depression has been linked to acne medications such as Accutane, a new study done on September 16, 2010 on Norway, found that the serious mental disorder may be connected to acne itself. A Norwegian study published in the Journal of Investigative Dermatology found 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.<sup>[9]</sup>

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.<sup>[10]</sup>

The present study aims to determine the prevalence of depression and its associated factors among acne patients in King Faisal and King Abdulaziz hospital in Makkah, Saudi Arabia.

## Materials and Methods

A cross sectional study was implemented among all acne patients, who attended dermatology clinic in both of King Faisal and King Abdul-Aziz hospitals in makkah city during the study period (July, 2013). Makkah is the holy City of whole Muslims. It is located in the western region of KSA. King Faisal and King Abdul-Aziz hospitals are considered from oldest hospitals in Makkah.

The diagnosis of acne included presence of white head comedon and black head comedon, papule, pustule, pseudocyst and scar. We excluded patients with history of a known mental disorder and those with somatic diseases such as heart, pulmonary, joint diseases, diabetes and epilepsy that affect their mental status.

A self-administered questionnaire was used for data collection. It consists of three parts: demographic data (age, gender and occupation), the Arabic version of Beck Depression Inventory questionnaire (BDI).<sup>[14]</sup> It has been used for screening of depression among the study population. It is a 21-item self-reported measure, and one of the most widely used screening instruments for detecting symptoms of depression. It can be administered to assess normal adults, adolescents, and individuals with psychiatric disorders (>13 years of age). It was designed to document a variety of depressive symptoms the individual experienced over the preceding week. Responses to the 21 items are made on a 4-point scale, ranging from 0 to 3 (total scores can range from 0 to 63). Intensity categories vary from absent or normal (0 to 9), mild (10 to 15), moderate (16 to 19), severe (20 to 29) and extremely severe (30 to 63).<sup>[12]</sup> Subjects with BDI scores over 13 were considered as depressive.<sup>[13]</sup> Questions about Associated factor such as family history of depression, stressful event in the last month, acne severity and acne treatment modality.

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 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.<sup>[14]</sup>

A pilot study was conducted in Hera'a General Hospital using the same questionnaire. The deficits were identified and modified accordingly.

Approval from Joint program of family and community medicine in Makkah was obtained. Permissions of the managers of King Faisal and King Abdul-Aziz hospitals were obtained.

## Statistical Analysis

Statistical Package for Social Sciences (SPSS) software version 18.0 was used for data entry and analysis. Descriptive statistics (e.g. number, percentage) and analytic statistics using Chi Square tests ( $\chi^2$ ) to test for the difference between two categorical variables were applied. P-value equal or less than 0.05 was considered statistically significant.

Depression based on the Arabic version of Beck Depression Inventory scale was treated as dependent variable in multivariate logistic regression analysis. Age, gender, severity of acne and history of stressful life events in the last month were treated as independent categorical variables. Multiple associations were evaluated in multiple logistic regression model based on the backward stepwise selection, where significant variables from the univariate analysis were included. This procedure allowed the estimation of the strength of the association between each independent variable while taking into account the potential confounding effects of the other independent variables. The covariates were removed from the model if the likelihood ratio statistic based on the maximum likelihood estimates had a probability of > 0.10. Each category of the predictor variables was contrasted with the initial category (reference category). The adjusted measure of association between risk factors and depression was expressed as the odds ratio (OR) with 95% Confidence Interval (95% CI). Adjusted or crude ORs with 95% CI that did not include 1.0 were considered significant.

## Results

The study included 228 patients, out of 259 invited to participate in the study giving response rate of 88%. The age of patients participated in the study, ranged between 14 and 39 years with a mean of  $23.9 \pm 5.7$  years. More than half of the participants were females (56.1%) while males represent 43.9% of them.

**Prevalence of depression among acne patients:** As displayed in figure 1, 40.8% reported depression, regardless its severity. Severe depression was reported by 12.3% of acne patients 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.

**Acne severity:** As shown in figure 2, slightly more than half of acne cases were mild (52.2) while only 14.5 were severe cases.

**Method of acne treatment:** Figure 3 shows that more than half of acne patients attended dermatology clinics during the study period were treated with topical products only (55.7%) while 28.9% were treated with a combination of topical products and oral therapy. In only 8.8% of acne patients, the treatment was only oral. In 6.6%, there was no treatment (mostly new cases).

**Associated factors:** Table 1 shows that over one-third of patients aged over 30 years (40%) as compared to only 3.8% of those in the age group 21-25 years had severe depression. This difference was statistically significant ( $P < 0.001$ ). Also, 18.8% of female acne patients had severe depression as compared to 4% of male acne patients. This difference was statistically significant ( $P = 0.006$ ). In addition, 12.5% of house wives had severe depression compared to 13.3% of teachers and 12.5% of employee and 17.1% among those not employed. However, this difference was not statistically significant. As seen in table 1, 18.2% of acne patients with family history of depression had severe depression as compared to 11.7% of severe depression reported by those with no family history of depression. However, this difference was not statistically significant ( $P > 0.05$ ).

Table 1 shows that 12.8% of acne patients with history of stressful life events during the last month, had severe depression as compared to 12.2% of severe depression reported by those with no history of stressful life events in the last month. This difference was statistically significant ( $P = 0.031$ ).

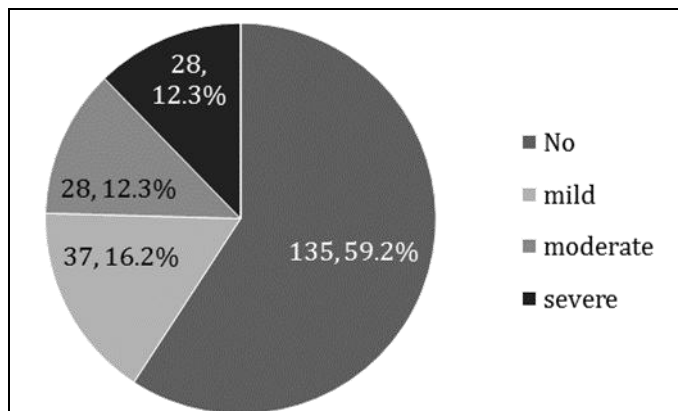


Figure-1: Prevalence of depression among acne patients

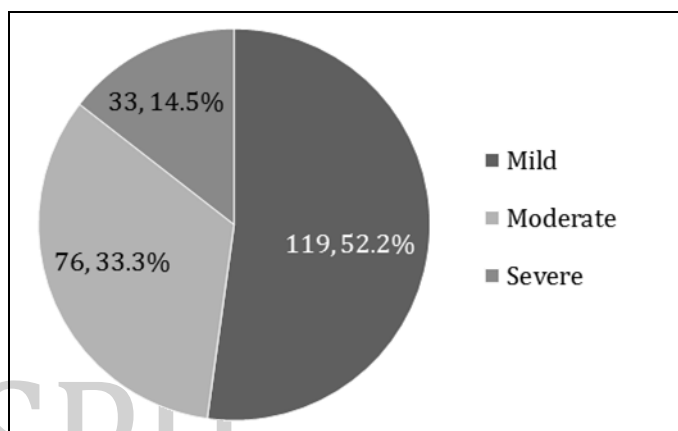


Figure-2: Distribution of acne patients according to severity of the disease

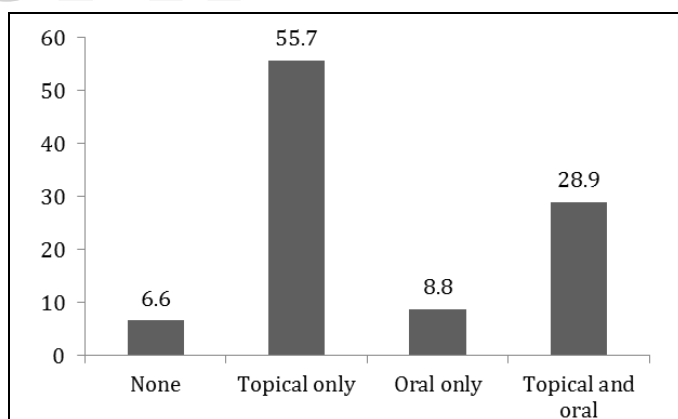


Figure-3: Distribution of acne patients according to severity of the disease

Severity of acne treatment was significantly associated with depression among acne patients,  $p < 0.001$ . Depression was observed to be severe among 42.4% of patients with severe degree of acne compared to 2.5% and 14.5% among those with mild and moderate degrees of acne, respectively.

Method of acne treatment was not significantly associated with depression among acne patients. Depression was observed to be severe among 15.2% of

**Table-1: Factors associated depression among acne patients**

Characteristics	Depression				$\chi^2$ (p-value)
	No (n=135) No. (%)	Mild (n=37) No. (%)	Moderate (n=28) No. (%)	Severe (n=28) No. (%)	
Age (years)	14-20 (69)	45 (65.2)	9 (13.0)	7 (10.1)	30.98 (0<0.001)
	21-25 (78)	52 (66.7)	14 (17.9)	9 (11.5)	
	26-30 (51)	26 (51.0)	11 (21.6)	9 (17.6)	
	>30 (30)	12 (40)	3 (10.0)	3 (10.0)	
Gender	Male (100)	68 (68.0)	16 (16.0)	12 (12.0)	12.29 (0.006)
	Female (128)	67 (52.3)	21 (16.4)	16 (12.5)	
Job status	No (41)	26 (63.4)	3 (7.3)	5 (12.2)	20.26 (0.162)
	Teacher (15)	9 (60.0)	2 (13.3)	2 (13.3)	
	Student (125)	79 (63.2)	21 (16.8)	13 (10.4)	
	House wife (16)	3 (18.8)	7 (43.6)	4 (25.0)	
	Employee (8)	4 (50.0)	2 (25.0)	1 (12.5)	
	Others (23)	14 (60.9)	2 (8.7)	3 (13.0)	
Family history of depression	No (206)	124 (60.2)	32 (15.5)	26 (12.6)	1.88 (-0.599)
	Yes (22)	11 (50.0)	5 (22.7)	2 (9.1)	
Stressful life events	No (181)	114 (63.0)	23 (12.7)	22 (12.2)	8.84 (-0.031)
	Yes (47)	21 (44.7)	14 (29.8)	6 (12.8)	
Acne severity	Mild (119)	85 (71.4)	25 (21.0)	6 (5.0)	57.3 (-0.001)
	Moderate (76)	40 (52.6)	8 (10.5)	17 (22.4)	
	Severe (33)	10 (30.3)	4 (12.1)	5 (15.2)	
Method of acne treatment	None (15)	13 (86.7)	2 (13.3)	0 (0.0)	12.33 (0.195)
	Topical only (127)	72 (56.7)	21 (16.4)	20 (15.7)	
	Oral only (20)	14 (70.0)	1 (5.0)	1 (5.0)	
	Both (66)	36 (54.5)	13 (19.7)	7 (10.6)	

**Table-2: Risk factors for depression: Results of multivariate Logistic Regression**

Variables	B	Standard error	Adjusted OR	95% Confidence interval	
Age (years)	14-20†		1		
	21-25	-0.395	0.96	0.71	0.41-2.08
	26-30	-0.367	0.631	0.47	0.36-2.19
	>30	1.231	0.458	3.98	1.69-9.01*
Gender	Male†		1		
	Female	1.596	1.267	2.88	1.34-7.63*
	Mild†		1		
Severity of acne	Moderate	1.229	1.262	1.69	0.88-2.66
	Severe	3.826	1.315	8.05	1.96-11.25*

† Reference category; \*  $P \leq 0.05$ ; Variable excluded from the model (not significant): stressful life events

acne patients treated with a combination of topical and oral products compared to none among those untreated patients. Moderate depression was documented by none of untreated acne patients, 15.7% of acne patients treated by topical products and 10.6% among acne patients treated with a combination of topical and oral products.

**Multivariate logistic regression analysis of risk factors for depression:** In the multivariate analysis, Patients aged over thirty had almost four-folded risk to develop depression as opposed to those with aged between 14 and 20 years (adjusted OR= 3.98, 95%CI= 1.69-9.01). On the other hand, female patients had almost three-folded risk to have depression than male patients (adjusted OR= 2.88, 95%CI= 1.34-7.63). Regarding severity of acne, patients with severe acne were at 8-folded higher risk to have depression as compared to those with mild acne (adjusted OR= 8.05, 95%CI= 1.96-11.25). However, mode of acne treatment was removed from the final logistic regression model.

(Table 2)

## Discussion

Many researchers believe that mood disorders in adolescents represent one of the most under diagnosed groups of illness in psychiatry. This is due to several factors: (1) young adolescents are not always able to express how they feel, (2) the symptoms of mood disorders take on different forms in adolescents than in adults, (3) mood disorders are often accompanied by other psychiatric disorders which can mask depressive symptoms, and (4) many physicians tend to think of depression and bipolar disorder as an illness of adulthood.<sup>[15]</sup>

A recently published longitudinal prospective study found that early-onset depression often persists, recurs, and continues in to adulthood, and indicates that depression in youth may also predict severer illness in adult life.<sup>[16]</sup>

There have been several efforts to improve the early detection of depression and to develop programs to prevent and treat it as soon as possible.<sup>[17]</sup>

In the current study, the BDI was utilized to detect the prevalence of depressive symptomatology and its expression in adolescents and adults treated from acne vulgaris. Although it is not designed for diagnostic purposes, its epidemiologic utility has been evaluated in several studies, which concluded that it is a reliable and valid instrument for detecting depressive disorders in adolescents and adult populations. Several studies support the BDI's usefulness in measuring and predicting depression in adolescent samples.<sup>[18,19]</sup> The scale's format is clear; it is simple to administer; and it is easily understood by this population.<sup>[20]</sup>

Acne may coexist with psychosocial disability for several reasons. A lack of proper education about acne can feed into the negativity associated with the disease and foster an environment of depression and anxiety. In a recent survey of adolescent high school students, less than half viewed acne as an actual "disease," but rather a negative, self-induced imperfection.<sup>[21]</sup> Other studies have found that some people blame "lack of cleanliness" as the cause of acne.<sup>[22,23]</sup> In the present study, depression was significantly associated with severity of acne.

Prevalence rates of actual depression in general population are estimated to range from 15-25%.<sup>[24]</sup> In our study, according to the Beck cut off scores, 28.5% of the sample had mild to moderate depression and 12.3% had severe depression. In a recent Indian study, a prevalence rate of depression among acne vulgaris patients was 25.6% using Hospital Anxiety and Depression Scale (HADS).<sup>[9]</sup> This high prevalence rate observed in the current study could be attributed to the fact that our patients were seeking medical advice from dermatologist and more than 55% were females. Moreover, the sensitivity of Beck depression scale is 68% and specificity for diagnosis of depression is 88%.<sup>[25]</sup> In addition, if we consider a BDI score over 13 as a cut-off level for diagnosis of depressive subjects according to Lasa, et al.<sup>[13]</sup> the prevalence of depression in the present work among Acne patients will be 31.1%. Our figure is still lower that has been reported in Iran among Acne patients referred to the dermatology clinic of Ghaem Hospital in Mashad. The prevalence rate of clinical depression was found to be 47.4% in patients with acne using BDI.<sup>[26]</sup>

Previous studies have also shown an association between mental problems and acne. In a large study in New Zealand of 9567 adolescents of 12-18 years of age, a significant odds ratio of 2.04 was seen between self-reported acne and depressive symptoms measured using Reynolds Adolescent Depression Scale.<sup>[25]</sup> In Australia, Kilkenny, et al found an association (OR = 1.61) between self-reported severe acne and psychiatric symptoms measured using the Clinical Interview Schedule among 2491 students.<sup>[27]</sup> These studies are in contrast to a recent Finnish study of 165 male conscripts with acne who did not suffer more depressive symptoms than patients with knee symptoms.<sup>[28]</sup> The Leeds acne grading scale was used to objectively measure acne, and mental problems were measured with the General Health Questionnaire and the Beck Depression Inventory. In yet another study of 2657 students aged 14 to 20 from Turkey, no association between acne and mental health was identified.<sup>[29]</sup> Acne was objectively assessed by the Global Acne Grading System and mental health by the Hospital Anxiety and Depression scale in the Turkish study.

The reason for these conflicting results is not obvious, but since there are many different instruments used to carry out the measurements and low number of participants in some of the studies, it is hard to compare the results. However, there are other observations that point to a link between mental health problems and acne. First of all, acne is a visual condition and may therefore cause a variety of psychosocial effects such as decreased self-confidence, social impairment, depression and anger.<sup>[30]</sup> Second, it is possible that mental health problems cause or increase acne. This is probably not as obvious, but there are several points that may support this view. Stressful events can exacerbate acne, as shown in a sample of 22 university students.<sup>[31]</sup>

It is suggested that neurogenic factors could contribute to the onset or exacerbation of acne formation, possibly via the neuropeptide substance P and increased number of nerve fibers around the sebaceous glands in acne patients.<sup>[31]</sup> Stress can elicit substance P from peripheral nerves and thereafter may accelerate lipogenesis in the sebaceous glands.<sup>[32]</sup> The increase in nerve fibers in acne-prone skin may result from raised expression of nerve growth factor on the sebaceous glands which act as a neurotrophic molecule stimulating the sprouting of nerve fibers in the skin.<sup>[32]</sup> In addition receptors for corticotrophin-releasing hormones have been identified on human sebocytes, especially acne-involved skin.<sup>[33]</sup>

Corticotrophin-releasing hormone can be one neuroendocrine factor that contributes the development and exacerbation of acne.<sup>[33]</sup> It has also been reported that antidepressive medication can improve acne.<sup>[34]</sup> Finally, there may be one or more common factors influencing both acne and mental problems. Medication can be one such factor, and the widely used drug for acne, isotretinoin, has been linked to an increase in depression, but no causal relationship has been established.<sup>[35]</sup> The results of the present study indicate that the prevalence of severe depression was 20% and 11% among acne patients treated with oral products only and topical products only while it was 15.2% among those treated with a combination of oral and topical products.

The major limitation of this study is the cross-sectional design which limits the interpretation of the direction of the associations. Further, collecting data using a questionnaire may be problematic, especially the possibility of dependent misclassification.<sup>[36]</sup> The strength of the study is the relatively high rate of participation (88%), the use of validated instruments to diagnose acne and measure depression.

## Conclusion

In this study, depression is prevalent among acne patients. Female, older and patients with severe acne showed more severe depression than others. This study points to mental problems as an important factor in acne, but the causal relationship remains elusive.

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