

Depression, Anxiety and Stress among Saudi Arabian Dermatology Patients

Cross-sectional study

*Anwar E. Ahmed,^{1,2} Abdulaziz M. Al-Dahmash,³ Qamra T. Al-Boqami,⁴ Yazeed F. Al-Tebainawi⁵

الاكتئاب والقلق والتوتر بين مرضى الأمراض الجلدية السعوديين دراسة مستعرضة

أنور أحمد، عبدالعزيز محمد الدهمش، قمرآء البقمي، يزيد فارس التبيناوي

ABSTRACT: Objectives: This study aimed to determine the prevalence of depression, anxiety and stress among Saudi Arabian dermatology patients and to assess associations with sociodemographic and clinical characteristics. **Methods:** This cross-sectional study was conducted among 300 consecutive dermatology patients visiting King Abdulaziz Medical City in Riyadh, Saudi Arabia, in August 2015. The Arabic version of the Depression, Anxiety and Stress Scale was used to screen for symptoms of depression, anxiety and stress. Quality of life (QOL) was assessed using the Dermatology Life Quality Index. **Results:** A total of 254 dermatology patients participated in the study (response rate: 84.7%). The prevalence of depression, anxiety and stress was 12.6%, 22.1% and 7.5%, respectively. The presence of at least one of these negative emotional states was noted among 24.4% of the cohort (95% confidence interval: 19.3–30.2%). Depression was significantly higher among subjects who lacked family support (26.5% versus 10.7%; $P = 0.006$) while anxiety was less common among patients who engaged in physical exercise (14.5% versus 29.4%; $P = 0.005$). According to the multivariate logistic regression analysis, poor QOL and a lack of family support were significant predictors of a negative emotional state. **Conclusion:** Almost a quarter of the studied Saudi Arabian dermatology patients were found to suffer from at least one negative emotional state. A lack of family support and poor QOL were the primary factors associated with a negative emotional state. Interventional studies are needed to examine the effects of social and family support on psychological conditions among Saudi Arabian dermatology patients.

Keywords: Depression; Anxiety; Psychological Stress; Quality of Life; Social Support; Dermatology; Saudi Arabia.

المخلص: أهداف: هدفت هذه الدراسة إلى تحديد مدى انتشار الاكتئاب والقلق والتوتر لدى مرضى الأمراض الجلدية السعوديين، وتقييم علاقتها بالخصائص الاجتماعية والديموغرافية والسرييرية. منهجية: أجريت هذه الدراسة المستعرضة على 300 مصاب بالأمراض الجلدية على التوالي لمدينة الملك عبد العزيز الطبية في الرياض، المملكة العربية السعودية، في شهر أغسطس 2015. وقد استخدمت النسخة العربية من مقياس الاكتئاب والقلق والإجهاد للكشف عن أعراض الاكتئاب والقلق والتوتر. تم تقييم نوعية الحياة (QOL) باستخدام مؤشر جودة الحياة للأمراض الجلدية. نتائج: شارك في الدراسة ما مجموعه 254 مريضاً بالأمراض الجلدية (معدل الاستجابة: 84.7%). بلغت نسبة انتشار الاكتئاب والقلق والتوتر في العينة 12.6%، 22.1% و 7.5% على التوالي. ولوحظ وجود واحد على الأقل منها بين 24.4% من العينة قيد الدراسة (فاصل الثقة 95%: المدى 19.3–30.2%). وجد أن معدل انتشار الاكتئاب أعلى بكثير بين الأشخاص الذين يفتقرون إلى الدعم الأسري (26.5% مقابل 10.7%؛ $P = 0.006$) بينما كان القلق أقل شيوعاً في المرضى الذين شاركوا في ممارسة الرياضة البدنية (14.5% مقابل 29.4%؛ $P = 0.005$). وفقاً لتحليل الانحدار اللوجستي متعدد المتغيرات، كان سوء نوعية الحياة (QOL) وعدم وجود الدعم الأسري هي أقوى العوامل التي تتنبأ بوجود حالة عاطفية سلبية. خاتمة: عانى ما يقرب من ربع مرضى الأمراض الجلدية السعوديين قيد الدراسة من حالة عاطفية سلبية واحدة على الأقل. كان عدم وجود دعم الأسرة وسوء نوعية الحياة (QOL) هي أكثر العوامل الأساسية المرتبطة بوجود حالة عاطفية سلبية. هناك حاجة لدراسات تدخلية لدراسة آثار الدعم الاجتماعي والأسري على تحسين الظروف النفسية لدى مرضى الأمراض الجلدية السعوديين.

كلمات مفتاحية: الاكتئاب، القلق، الإجهاد النفسي، جودة الحياة، الدعم الاجتماعي، الأمراض الجلدية، العربية السعودية.

ADVANCES IN KNOWLEDGE

- Little is known regarding the prevalence of depression, anxiety and stress among Saudi Arabian dermatology patients. The findings of this study indicated that 24.4% of Saudi Arabian dermatology patients had at least one of these negative emotional states.
- In this study, the primary factors associated with a negative emotional state were a lack of family support and poor quality of life (QOL).

APPLICATION TO PATIENT CARE

- As almost a quarter of the studied Saudi Arabian dermatology patients were found to suffer from at least one negative emotional state, dermatology patients should be routinely screened for psychological symptoms, a lack of social/family support and poor QOL. Appropriate psychiatric counselling should then be provided as part of the dermatological treatment.

PSYCHIATRIC OR PSYCHOLOGICAL FACTORS play a role in approximately 30% of dermatology disorders; stress, for example, can affect or exacerbate chronic skin diseases.¹⁻³ An international multicentre cross-sectional study across 13 European countries found that 10.1% and 17.2% of dermatology patients suffered from depression and anxiety, respectively.⁴ When compared to healthy controls or the general population, dermatology patients are more likely to suffer from anxiety and depression; in a Norwegian study, 13% versus 3.7% and 5.8% versus 0.9% of dermatology patients versus controls suffered from anxiety and depression, respectively.⁵ Another study found the overall prevalence of depression and anxiety in patients with atopic dermatitis to be 15% and 12%, respectively; in terms of gender, these negative emotional states were more prevalent in females.⁶ Another study explored the factors associated with psychiatric morbidity among 1,389 dermatological outpatients; the overall prevalence of psychiatric morbidity was 20.6%, although female subjects with lesions on the face or hands had a greater prevalence over males.⁷ Other psychiatric disorders, such as suicidal ideation, also appear to be more common in dermatology patients in comparison to the general public.^{8,9} Anxiety levels and quality of life (QOL) have likewise been shown to be affected by dermatological disorders, with atopic dermatitis patients suffering from increased anxiety and a poorer QOL when compared to healthy individuals.^{10,11}

Although psychological symptoms are common among dermatology patients, few relevant studies on this subject have been conducted among Arab populations. At the Khartoum Hospital in Sudan, Mufaddel *et al.* found that rates of depression and anxiety were higher among dermatology outpatients with acne, vitiligo, eczema and psoriasis compared with healthy controls.¹² At the King Khalid University Hospital in Riyadh, Saudi Arabia, 29% and 14% of dermatology patients had anxiety and depression, respectively.¹³ Another study examined Arab vitiligo patients' beliefs and perceptions of their condition; 54% and 57% of the subjects reported feeling depressed or anxious, respectively.¹⁴ In the Qassim region of Saudi Arabia, 54.5% of vitiligo patients were found to suffer from depression.¹⁵ As there has been little research conducted on this topic among Arab dermatology patients, this study aimed to assess depression, anxiety and stress among a sample of Saudi Arabian dermatology patients and to investigate associations with sociodemographic and clinical characteristics.

Methods

This cross-sectional survey was conducted among 300 consecutive outpatients visiting the Dermatology Outpatient Clinic at King Abdulaziz Medical City (KAMC) in Riyadh, Saudi Arabia, in August 2015. Only teenagers (14–17 years old) and adults (≥ 18 years old) were included in the study. Patients who could not read or write Arabic were excluded. Based on the literature, the estimated prevalence of psychiatric morbidities among dermatology outpatients was set at 20.6%.⁷ In order to determine the prevalence among the study cohort with a precision of 5% and a 95% confidence interval (CI), the required sample size was 252 subjects. Consequently, 300 KAMC dermatological patients were included in the study.

Demographic and clinical data (including age, gender, marital status, education level, employment status, income, physical activity level, smoker status, family support and the presence of specific dermatological conditions, obesity or hypertension) were collected from all participants. Depression, anxiety and stress were self-assessed by participants using an Arabic version of the 21-item Depression, Anxiety and Stress Scale (DASS-21).^{16,17} Each item had four possible responses (never, sometimes, often and almost always) represented by scores of 0, 1, 2 and 3, respectively.^{16,17} Participants were considered to have a negative emotional state if they suffered from at least one symptom of depression, anxiety or stress according to their questionnaire responses. Quality of life (QOL) was assessed using the validated Arabic version of the 10-item Dermatology Life Quality Index (DLQI).^{18,19} The DLQI is a self-administered tool which evaluates the impact of dermatological diseases on QOL.^{18,19} Items were scored on a four-point scale (range: 0–3); a score of < 1 was considered to indicate an adequate QOL.^{18,19}

Data were analysed using the Statistical Package for the Social Sciences (SPSS), Version 22 (IBM Corp., Chicago, Illinois, USA). Demographic and clinical characteristics were reported descriptively. Prevalence rates of depression, anxiety and stress, as well as the prevalence rate of at least one of these negative emotional states, were reported with 95% CIs. A Chi-squared test was used to analyse associations between categorical variables and negative emotional states. A *P* value of ≤ 0.050 was considered statistically significant and indicated an association through a bivariate analysis. A multivariate logistic regression model was used to study the associations between clinical or sociodemographic variables and negative

emotional states. Adjusted odds ratios (aORs) were used to measure the strength of the associations between risk factors and negative emotional states.

This study was approved by the Institutional Review Board at the King Abdullah International Medical Research Center (#RSS15/047).

Results

A total of 254 subjects participated in the study (response rate: 84.7%). Of these, 59.8% were female, 43.4% were employed and 40.0% were married. Only 17.7% of the subjects were teenagers while 82.3% were adults. Approximately half of the subjects did not engage in regular physical activity (50.2%), 22.5% were obese, 11.7% were hypertensive and 8.5% were smokers. More than half of the subjects (51.3%) had a university degree. A total of 23.6% reported a lack of family support. The majority of the subjects had *acne vulgaris* (29.5%), followed by atopic dermatitis (22.3%), *vitiligo* (20.7%) and *psoriasis* (6.4%); the remainder had other diseases such as *alopecia areata*, lichen *planus* or warts.

Prevalence rates of depression, anxiety and stress were 12.6% (95% CI: 8.8–17.3%), 22.1% (95% CI: 17.1–27.7%) and 7.5% (95% CI: 4.6–11.4%), respectively. The prevalence of at least one of these negative emotional states was 24.4% (95% CI: 19.3–30.2%). Table 1 presents rates of depression, anxiety, stress or at least one of these negative emotional states in relation to demographic and clinical data. Depression was significantly more common among subjects who reported a lack of family support in comparison to those reporting sufficient family support (26.5% versus 10.7%; $P = 0.006$). Those with poor QOL were also significantly more likely to be depressed compared to those with adequate QOL (15.6% versus 1.9%; $P = 0.007$). Anxiety was significantly less common among subjects who engaged in regular physical exercise compared to those who did not (14.4% versus 29.4%; $P = 0.005$) and among non-obese compared to obese subjects (18.7% versus 33.3%; $P = 0.037$). Participants with sufficient family support were significantly less likely to be stressed than those without family support (6.3% versus 16.3%; $P = 0.041$), while those with poor QOL were significantly more likely to be stressed than those with adequate QOL (9.6% versus 0.0%; $P = 0.016$). Subjects engaging in regular physical activity compared to those who did not regularly exercise (16.8% versus 31.8%; $P = 0.006$) and those with family support compared to those without (22.6% versus 38.8%; $P = 0.025$) were significantly less likely to have at least one negative emotional state.

No significant associations were found between negative emotional states and other demographic or clinical characteristics.

After controlling for clinical and sociodemographic variables, the multivariate logistic regression model revealed that only poor QOL was significantly associated with the presence of at least one negative emotional state. The odds of suffering from at least one negative emotional state were 3.5 times higher in subjects with poor QOL compared to those with an adequate QOL (aOR: 3.5, 95% CI: 1.1–11.5; $P = 0.039$). Sufficient family support was negatively associated with the risk of at least one negative emotional state (aOR: 0.3, 95% CI: 0.1–0.8; $P = 0.013$). Although the effect of gender was not significant, the presence of at least one negative emotional state occurred 2.9 times more frequently in females than in males (aOR: 2.9, 95% CI: 1.0–8.4; $P = 0.057$) [Table 2].

Discussion

Prevalence rates of depression, anxiety and stress among Saudi Arabian dermatological patients in the current study were similar to a previous study investigating psychological disorders among dermatology patients.¹ However, other local studies have reported much higher rates of depression and anxiety in dermatology patients.^{13–15} One possible reason for this discrepancy in prevalence rates may be the use of different assessment tools. For example, the study conducted in the Qassim region used the Beck Depression Scale, while the current study used the DASS-21.¹⁵ Mina *et al.* reported differences in levels of anxiety and depression between males and females.⁶ Although gender differences were not significant in the current study, negative emotional states nevertheless occurred 2.9 times more frequently among females.

Certain studies have indicated a link between the type of dermatological disorder and the presence of depression, anxiety or stress. An international multicentre observational cross-sectional study found that patients with psoriasis, atopic dermatitis, hand eczema and leg ulcers had the highest prevalence of depression and anxiety among dermatology patients.⁴ Another study also found a relationship between negative emotional states and types of skin disease; patients suffering from hair loss had the highest combined scores of anxiety and depression while those with psoriasis had the highest depression scores.¹³ Sharma *et al.* found evidence of depression in 23.3% of psoriasis patients and 10% in vitiligo patients.²⁰ A recent review of the literature reported the prevalence of depression in psoriasis patients

Table 1: Prevalence of depression, anxiety and stress* according to sociodemographic and clinical characteristics among Saudi Arabian dermatology patients (N = 254)

Characteristic [†]	Overall, n (%)	Negative emotional state							
		Depression (n = 32)		Anxiety (n = 56)		Stress (n = 19)		At least one (n = 62)	
		n (%)	P value	n (%)	P value	n (%)	P value	n (%)	P value
Gender			0.272		0.166		0.770		0.131
Male	102 (40.2)	10 (9.8)		18 (17.7)		7 (6.9)		19 (18.6)	
Female	152 (59.8)	22 (14.5)		38 (25.0)		12 (7.9)		43 (28.3)	
Age			0.188		0.249		0.999		0.256
Teenager	44 (17.7)	3 (6.8)		7 (15.9)		3 (6.8)		8 (18.2)	
Adult	205 (82.3)	29 (14.2)		49 (23.9)		16 (7.8)		54 (26.3)	
Marital status			0.757		0.421		0.845		0.952
Unmarried	150 (60.0)	20 (13.3)		31 (20.7)		11 (7.3)		37 (24.7)	
Married	100 (40.0)	12 (12.0)		25 (25.0)		8 (8.0)		25 (25.0)	
Education level			0.324		0.326		0.405		0.706
High school or less	116 (48.7)	13 (11.2)		30 (25.9)		11 (9.5)		31 (26.7)	
University	122 (51.3)	19 (15.6)		25 (20.5)		8 (6.6)		30 (24.6)	
Employment status			0.938		0.163		0.729		0.340
Employed	106 (43.4)	13 (12.3)		28 (26.4)		9 (8.5)		30 (28.3)	
Unemployed	64 (26.2)	9 (14.0)		16 (25.0)		5 (7.8)		17 (26.6)	
Student	74 (30.3)	10 (13.5)		11 (14.9)		4 (5.4)		14 (18.9)	
Income in SR			0.384		0.364		0.802		0.379
None	83 (35.6)	10 (12.1)		16 (19.3)		6 (7.2)		18 (21.7)	
<10,000	114 (48.9)	19 (16.7)		31 (27.2)		10 (8.8)		34 (29.8)	
≥10,000	36 (15.5)	3 (8.3)		7 (19.4)		2 (5.6)		8 (22.2)	
Regular physical activity			0.362		0.005 [‡]		0.840		0.006 [‡]
Yes	125 (49.8)	13 (10.4)		18 (14.4)		9 (7.2)		21 (16.8)	
No	126 (50.2)	18 (14.3)		37 (29.4)		10 (7.9)		40 (31.8)	
Smoker			0.999		0.425		0.999		0.236
Yes	21 (8.5)	2 (9.5)		3 (14.3)		1 (4.8)		3 (14.3)	
No	227 (91.5)	30 (13.2)		53 (23.4)		18 (7.9)		59 (26.0)	
Obese			0.526		0.037 [‡]		0.768		0.143
Yes	45 (22.5)	5 (11.1)		15 (33.3)		3 (6.7)		15 (33.3)	
No	155 (77.5)	23 (14.8)		29 (18.7)		14 (9.0)		35 (22.6)	
Hypertensive			0.392		0.484		0.999		0.722
Yes	29 (11.7)	2 (6.9)		8 (27.6)		2 (6.9)		8 (27.6)	
No	220 (88.4)	30 (13.6)		48 (21.8)		17 (7.7)		54 (24.6)	
Family support			0.006 [‡]		0.086		0.041 [‡]		0.025 [‡]
Yes	159 (76.4)	17 (10.7)		33 (20.8)		10 (6.3)		36 (22.6)	
No	49 (23.6)	13 (26.5)		16 (32.7)		8 (16.3)		19 (38.8)	

Type of skin disease			0.516	0.124	-	0.189
Psoriasis	16 (6.4)	3 (18.8)	3 (18.8)		1 (6.3)	3 (18.8)
Vitiligo	52 (20.7)	5 (9.6)	7 (13.5)		4 (7.7)	8 (15.4)
Atopic dermatitis	56 (22.3)	6 (10.7)	12 (21.4)		4 (7.1)	14 (25.0)
Acne vulgaris	74 (29.5)	13 (17.6)	24 (32.4)		9 (12.2)	25 (33.8)
Other	53 (21.1)	5 (9.4)	10 (18.9)		1 (1.9)	12 (22.6)
QOL [§]			0.007 [‡]	0.067	0.016 [‡]	0.062
Poor	199 (78.7)	31 (15.6)	49 (24.6)		19 (9.6)	54 (27.1)
Adequate	54 (21.3)	1 (1.9)	7 (13.0)		0 (0.0)	8 (14.8)

SR = Saudi Arabian riyal; QOL = quality of life.

*Depression, anxiety and stress were self-assessed by participants using the Arabic version of the Depression, Anxiety and Stress Scale.^{16,17} †Some data missing from certain variables as the participants did not respond to all questionnaire items. ‡Significant at $\alpha = 0.05$ using Chi-squared or Fisher's Exact tests. §QOL was self-assessed by participants using the Arabic version of the Dermatology Life Quality Index.^{18,19}

Table 2: Sociodemographic and clinical factors influencing negative emotional states* among Saudi Arabian dermatology patients (N = 254)

Factor	Reference	B	SE	Wald	P value	aOR	95% CI	
							Lower	Upper
Female	Male	1.0	0.5	3.6	0.057	2.9	1.0	8.4
Adult	Teenager	0.6	1.0	0.4	0.526	1.9	0.3	13.7
Married	Unmarried	-0.4	0.5	0.5	0.470	0.7	0.3	1.9
University-educated	High school education or less	-0.8	0.6	1.9	0.169	0.4	0.1	1.4
Employed	Student	0.6	0.7	1.0	0.326	1.9	0.5	7.0
Unemployed	Student	-0.3	0.8	0.2	0.688	0.7	0.2	3.3
Income <10,000 SR	No income	0.3	0.6	0.3	0.585	1.4	0.4	4.5
Income ≥10,000 SR	No income	0.3	0.9	0.1	0.770	1.3	0.2	7.5
Physical activity	No physical activity	-0.3	0.4	0.4	0.526	0.8	0.3	1.7
Smoker	Non-smoker	0.2	0.9	0.1	0.820	1.2	0.2	6.9
Obese	Not obese	0.4	0.5	0.7	0.398	1.6	0.6	4.3
Hypertensive	Not hypertensive	-0.7	0.8	0.8	0.369	0.5	0.1	2.2
Family support	No family support	-1.2	0.5	6.1	0.013 [†]	0.3	0.1	0.8
Vitiligo	Psoriasis	-0.6	1.0	0.4	0.505	0.5	0.1	3.4
Atopic dermatitis	Psoriasis	-1.1	1.0	1.2	0.270	0.3	0.1	2.3
Acne vulgaris	Psoriasis	-0.2	0.9	0.0	0.863	0.9	0.2	5.0
Other skin disease	Psoriasis	-0.8	1.0	0.7	0.406	0.5	0.1	3.0
Poor QOL [‡]	Adequate QOL [‡]	1.3	0.6	4.3	0.039 [†]	3.5	1.1	11.5
Constant		-1.6	1.3	1.4	0.229	0.2	-	-

SE = standard error; aOR = adjusted odds ratio; CI = confidence interval; SR = Saudi Arabian riyal; QOL = quality of life.

*Depression, anxiety and stress were self-assessed by participants using the Arabic version of the Depression, Anxiety and Stress Scale.^{16,17} †Significant as a risk factor for a negative emotional state at $\alpha = 0.05$. ‡QOL was self-assessed by participants using the Arabic version of the Dermatology Life Quality Index.^{18,19}

to be 10–62%.²¹ In another study, depression (67% versus 12%) and anxiety (45% versus 18%) rates were higher in psoriasis patients than a control group.¹¹ Kurd *et al.* noted that the risk of being diagnosed with depression, anxiety or suicidal ideation was 39% higher in patients with psoriasis compared to healthy controls.²² However, no relationship was seen in the current study between negative emotional states and the type of dermatological disease.

The current study also assessed whether Saudi Arabian dermatology patients received sufficient family support. Lower levels of depression and stress were found among subjects with family support compared to those who had none. Another factor which contributed significantly to depression and stress among the studied Saudi Arabian dermatological patients was poor QOL. Considering these findings, the researchers recommend screening dermatology patients for psychological morbidities and including appropriate psychiatric counselling and QOL evaluations as part of standardised dermatological treatment and management. In addition, future intervention studies are necessary to examine the effects of social and family support on the frequency of depression, anxiety and stress among Saudi Arabian dermatology patients.

There are several limitations to the current study. First, the findings are based on a cross-sectional assessment in which associations do not indicate causation. Second, the study relies on self-reported responses to the DASS-21 questionnaire and not on clinical diagnoses. Third, a healthy control group was not included in this study to determine the overall rate of negative emotional states in the general Saudi Arabian population.

Conclusion

Almost a quarter of the studied Saudi Arabian dermatology patients were found to suffer from at least one negative emotional state, including depression, anxiety or stress. A lack of family support and poor QOL were significantly associated with a negative emotional state among the subjects. As such, further research is needed to investigate the effects of QOL and social and family support on psychological morbidities among Saudi Arabian dermatology patients. Screening for psychological symptoms should be carried out among all dermatology patients and appropriate psychiatric counselling should be provided as required.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

References

1. Gupta MA, Gupta AK. Psychiatric and psychological comorbidity in patients with dermatologic disorders: Epidemiology and management. *Am J Clin Dermatol* 2003; 4:833–42. doi: 10.2165/00128071-200304120-00003.
2. Jafferany M. Psychodermatology: A guide to understanding common psychocutaneous disorders. *Prim Care Companion J Clin Psychiatry* 2007; 9:203–13. doi: 10.4088/PCC.v09n0306.
3. Osman OT, Mufaddel A, Almugaddam F, Augusterfer EF. The psychiatric aspects of skin disorders. *Expert Rev Dermatol* 2011; 6:195–209. doi: 10.1586/edm.11.10.
4. Dalgard FJ, Gieler U, Tomas-Aragones L, Lien L, Poot F, Jemec GB, et al. The psychological burden of skin diseases: A cross-sectional multicenter study among dermatological out-patients in 13 European countries. *J Invest Dermatol* 2015; 135:984–91. doi: 10.1038/jid.2014.530.
5. Balieva F, Lien L, Kupfer J, Halvorsen JA, Dalgard F. Are common skin diseases among Norwegian dermatological outpatients associated with psychological problems compared with controls? An observational study. *Acta Derm Venereol* 2016; 96:227–31. doi: 10.2340/00015555-2200.
6. Mina S, Jabeen M, Singh S, Verma R. Gender differences in depression and anxiety among atopic dermatitis patients. *Indian J Dermatol* 2015; 60:211. doi: 10.4103/0019-5154.152564.
7. Picardi A, Abeni D, Renzi C, Braga M, Puddu P, Pasquini P. Increased psychiatric morbidity in female outpatients with skin lesions on visible parts of the body. *Acta Derm Venereol* 2001; 81:410–4. doi: 10.1080/000155501317208345.
8. Hughes JE, Barraclough BM, Hamblin LG, White JE. Psychiatric symptoms in dermatology patients. *Br J Psychiatry* 1983; 143:51–4. doi: 10.1192/bjp.143.1.51.
9. Dieris-Hirche J, Gieler U, Kupfer JP, Milch WE. [Suicidal ideation, anxiety and depression in adult patients with atopic dermatitis]. *Hautarzt* 2009; 60:641–6. doi: 10.1007/s00105-009-1744-y.
10. Linnet J, Jemec GB. An assessment of anxiety and dermatology life quality in patients with atopic dermatitis. *Br J Dermatol* 1999; 140:268–72. doi: 10.1046/j.1365-2133.1999.02661.x.
11. Golpour M, Hosseini SH, Khademloo M, Ghasemi M, Ebadi A, Koohkan F, et al. Depression and anxiety disorders among patients with psoriasis: A hospital-based case-control study. *Dermatol Res Pract* 2012; 2012:381905. doi: 10.1155/2012/381905.
12. Mufaddel A, Abdelgani AE. Psychiatric comorbidity in patients with psoriasis, vitiligo, acne, eczema and group of patients with miscellaneous dermatological diagnoses. *Open J Psychiatr* 2014; 4:168–75. doi: 10.4236/ojpsych.2014.43022.
13. AlShahwan MA. The prevalence of anxiety and depression in Arab dermatology patients. *J Cutan Med Surg* 2015; 19:297–303. doi: 10.2310/7750.2014.14110.
14. AlGhamdi KM. Beliefs and perceptions of Arab vitiligo patients regarding their condition. *Int J Dermatol* 2010; 49:1141–5. doi: 10.1111/j.1365-4632.2010.04514.x.
15. Al-Harbi M. Prevalence of depression in vitiligo patients. *Skinmed* 2013; 11:327–30.
16. Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychol Assess* 1998; 10:176–81. doi: 10.1037/1040-3590.10.2.176.
17. Taouk M, Lovibond PE, Laube R. Psychometric properties of an Arabic version of the Depression Anxiety Stress Scales (DASS). From: www2.psy.unsw.edu.au/dass/Arabic/Arabic%20DASS%20Report.doc Accessed: Dec 2015.

18. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI): A simple practical measure for routine clinical use. *Clin Exp Dermatol* 1994; 19:210–16. doi: 10.1111/j.1365-2230.1994.tb01167.x.
19. Khoudri I, Lamchahab FZ, Ismaili N, Senouci K, Hassam B, Abouqal R. Measuring quality of life in patients with psoriasis using the Arabic version for Morocco of the Dermatology Life Quality Index. *Int J Dermatol* 2013; 52:795–802. doi: 10.1111/j.1365-4632.2011.05450.x.
20. Sharma N, Koranne RV, Singh RK. Psychiatric morbidity in psoriasis and vitiligo: A comparative study. *J Dermatol* 2001; 28:419–23. doi: 10.1111/j.1346-8138.2001.tb00003.x.
21. Chamoun A, Goudetsidis L, Poot F, Bourdeaud'hui F, Titeca G. [Psoriasis and depression]. *Rev Med Brux* 2015; 36:23–8.
22. Kurd SK, Troxel AB, Crits-Christoph P, Gelfand JM. The risk of depression, anxiety, and suicidality in patients with psoriasis: A population-based cohort study. *Arch Dermatol* 2010; 146:891–5. doi: 10.1001/archdermatol.2010.186.