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RESEARCH

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Stress, anxiety, and depression in patients with vitiligo

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Abstract

Background: Vitiligo has a significant effect on patients' quality of life; they feel stigmatized and disturbed by their condition. A lot of vitiligo patients, according to reports, suffer from psychological disturbances. The aim of the study is to find the relation between vitiligo and stress, anxiety, and depression and to measure how vitiligo affects the quality of life index. This study included 50 vitiligo patients and 50 matched healthy control groups. All patients were assessed by the Depression Anxiety Stress Scale (DASS) to determine the severity of anxiety, depression, and stress symptoms and the Dermatology Life Quality Index (DLQI) scale to evaluate their quality of life while the control group underwent only the Depression Anxiety Stress Scale.

Results: The prevalence of stress was 76% (n=38), anxiety was 78% (n=39), and depression was 80% (n=40); the difference was statistically significant between patient group and control group regarding stress, anxiety, and depression. Gender had a significant relationship with stress, anxiety, and depression ($p < 0.05$) (female affected more than male). Also, there was a statistically significant relation between the degree of vitiligo and anxiety ($p < 0.05$). Vitiligo has a moderate to very severe effect on the quality of life index. There was a statistically significant positive correlation between stress and feeling of embarrassment from vitiligo and clothes choice.

Conclusion: Vitiligo is a psychcutaneous disease that does not only affect the patient's physical status, but also his mental and psychological status.

Keywords: Vitiligo, Depression, Anxiety, Stress

Background

Vitiligo is an acquired, multi-factorial and usually progressive disorder of melanin production. Vitiligo equally affects males and females as well as all different races. Vitiligo has various onset-age, distribution pattern and progression course. Vitiligo is the most prevalent cutaneous pigmentary disorder. Its prevalence reaches 0.5–2%, worldwide. The mean age of onset is about 20 years, and 95% of cases are under the age of 40 [1–3].

On account of severity of differentiation between depigmented and normal skin, darker skin people usually face more stigmatization, discrimination, and perhaps major psychosocial issues [4]. About 75% of vitiligo patients have a psychiatric condition, according to reports. Depression, anxiety, and stress are shared psychological disorders in vitiligo patients [5].

There might be huge constraints to the patients' quality of life (QoL) when vitiligo affects the obvious parts of the body or the genitals [6]. It should be noted that vitiligo is usually asymptomatic, so its effect on quality of life is much more related to psychological problems, such as lack of self-confidence [7, 8], unpleasant body images [9], unsuccessful social relationships [4], and lower quality of marital relations [10, 11], than the exclusive physical issues.

Multiple mechanisms have been proposed for melanocyte destruction in vitiligo. These include genetic, autoimmune responses, oxidative stress, generation of

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inflammatory mediators, and melanocyte detachment mechanisms. Both innate and adaptive arms of the immune system appear to be involved. None of these proposed theories are in themselves sufficient to explain the different vitiligo phenotypes, and the overall contribution of each of these processes is still under debate, although there is now consensus on the autoimmune nature of vitiligo. Several mechanisms might be involved in the progressive loss of melanocytes, and they consist either of immune attack or cell degeneration and detachment. The "convergence theory" or "integrated theory" suggests that multiple mechanisms may work jointly in vitiligo to contribute to the destruction of melanocytes, ultimately leading to the same clinical result [12–16].

This study aims to find the relation between vitiligo and stress, anxiety, and depression and to measure how vitiligo affects the quality of life index.

Methods

Our study is a case-control involving fifty patients of both sexes with the diagnosis of vitiligo and fifty healthy volunteers as a control group (from families of Fayoum University hospitals' medical and paramedical staff) matched in age, gender, and academic level. Patients were selected from Dermatology Department, Fayoum University Hospital, within the period from October 2019 to March 2020. Vitiligo patients were between 12 to 60 years old. Both genders were included. They included 14 males (28.0%) and 36 females (72.0%). Patients under the age of 12 and those with other dermatological disorders that can cause stress, anxiety, or depression were excluded from the study.

This study was accepted by the faculty of medicine, Fayoum University Research Ethical Committee. The study's goals were explained to the participants after they gave their consent. They were assured confidentiality and the right to refuse to take part in the research.

Following that, all of the patients were evaluated as follows:

1. History taking

Name, age, sex, marital status, family history, work, age of onset, any stress before (death of family member), any physical trauma, sort of vitiligo, form of treatment, duration of treatment, other diseases related and other cutaneous manifestation, and degree of vitiligo according to the Vitiligo Area Scoring Index (VASI) score which were done by dermatologist.

2. Vitiligo Area Scoring Index (VASI)

Hamzavi et al. [17] have introduced a quantitative parametric score, named VASI for Vitiligo Area Scoring Index, which is conceptually derived from the PASI score widely used in psoriasis assessment [18]. The total body VASI is calculated using a formula that includes contributions from all body regions (possible range, 0–100).

VASI = Σ(all body sites) (hand units) × (depigmentation)

One hand unit, which encompasses the palm plus the volar surface of all the digits, is approximately 1% of the total body surface area and is used as a guide to estimate the baseline percentage of vitiligo involvement in each body region. The body is divided into five separate and mutually exclusive regions: hands, upper extremities (excluding hands), trunk, lower extremities (excluding feet), and feet. The axillary region is included with the upper extremities while the buttocks and inguinal areas are included with the lower extremities. The extent of residual depigmentation is expressed by the following percentages: 0, 10%, 25%, 50%, 75%, 90%, or 100%. At 100% depigmentation, no pigment is present; at 90%, specks of pigment are present; at 75%, the depigmented area exceeds the pigmented area; at 50%, the depigmented and pigmented areas are equal; at 25%, the pigmented area exceeds the depigmented area; at 10%, only specks of depigmentation are present.

3. Depression anxiety stress SCALE (DASS) [19]

The Depression Anxiety and Stress Scale is a 21-question shortened version with 7 questions for each psychological morbidity. The questionnaire asked about a recent experience with the products, and each one is graded from 0 (did not matter to me at all) to 3 (applied to me very much). The main goal of the DASS is to figure out how severe anxiety, depression, and stress symptoms are. The total score is determined by adding the scores for all of the products. The Arabic version [20] was used.

4. Dermatology Life Quality Index (DLQI)

The DLQI is a dermatology-specific, patient-reported quality of life test which is commonly used to assess vitiligo patients' quality of life. It has ten questions that assess everyday tasks, recreation, symptoms, and emotions, as well as work and school and personal relationships [21]. Since the patient answers each question on a scale of 0 to 3, the DLQI is determined by adding the scores for each question, yielding a score that ranges from 0 to 30. The higher the ranking, the worse the quality of life has been. A score of more than ten indicates that the skin disorder has a significant impact on one's quality of life. No impact (0–1), slight effect (2–5), moderate effect (6–10), extremely large effect (11–20), and intensely large effect (21–30) on patients' lives are the categories [22]. The Arabic version for the Dermatology Life Quality Index was used [23].

Statistical analysis

Results were collected, tabulated and statistically analyzed by an IBM compatible personal computer with SPSS statistical package version 23 [24]. Student's t-test is a test of significance used for comparison of quantitative variables between two groups of normally distributed data. ANOVA test was used for comparison of quantitative variables between more than two groups of normally distributed data. Bivariate Pearson correlation test was also used to test the association between variables. P value < 0.05 was considered significant.

Results

Demographic and clinical data of study groups are included in Table 1. The mean age of patients was 34.69± 5.87 (62% (n=31) were <40 years and 38% (n=19) were ≥40 years). Seventy-two percent (n=36) were females and 28% (n=14) were males. Fifty-eight percent (n=29) were married and 42% (n=21) were single.

The prevalence of stress was 76% (n=38), anxiety was 78% (n=39), and depression was 80% (n=40) (Figs. 1, 2, and 3 and Table 2). The quality of life index in vitiligo sufferers is included in Table 3.

There was a statistical difference between patient and control groups regarding stress, anxiety, and depression ($p < 0.001$) (Fig. 4).

There was no statistically significant correlation between age of patients in years, marital status, type of work, type of vitiligo, site of lesions, type of therapy whether systemic therapy or UVB therapy, and either stress, anxiety, or depression ($p > 0.05$), while there was a significant positive correlation between gender and anxiety ($p < 0.05$) (female affected more than male). Also, there was a statistically significant positive correlation between moderate to a severe degree of vitiligo and both anxiety and depression, and there was a statistically significant positive correlation between family history of vitiligo and depression (Table 4).

There was a statistically significant positive correlation between stress and embarrassment of vitiligo and clothes choice. However, there was no statistically significant correlation between the patient's psychological status and other parameters of quality of life (Table 5).

Discussion

In the present study, 38 (76%) patients experienced moderate to severe stress, 39 (78%) patients experienced moderate to severe anxiety, and 40 (80%) patients experienced moderate to severe depression. These findings are consistent with Henning et al. [25] whom reported that vitiligo patients experience a lot of stress. The incidence and development of vitiligo can be influenced by the stress in which the patients are subjected to. Also, these findings are consistent with Nikam et al. [26] who reported that vitiligo is strongly associated with psychiatric disorders. Depression and anxiety remain the foremost common. Also, according to Vernwal [27], a stress-vitiligo cycle occurs when vitiligo causes psychological discomfort and adversely affects social relations.

Within this study, vitiligo patients are slightly more likely than control group to have stress, anxiety, and depression. These findings corroborate those of Lai et al. [28] who found that patients suffering vitiligo are slightly more likely than those without vitiligo to have an affective disorder or experience depressive symptoms. Also, Öztekin and Öztekin [29] found a significantly higher depression level and worse sleep quality in the vitiligo patients than the control group. Also, Hamidizadeh et al. [5] found that the quantity of tension and hopelessness in patients with vitiligo was significantly higher than healthy controls.

Regarding the possible causes of vitiligo, the death of a family member was identified as a potential cause of vitiligo in 22% of patients; according to the current study, 6% had family member illness, and 16% had fear as other possible causes of their vitiligo. These results are in agreement with Cupertino et al. [30] who reported that stressful life events generate vitiligo. As they conducted a large study that assessed 1541 vitiligo patients to assess the stressors' effect on these patients Among the attendees and before the onset of vitiligo within 2 years, 56.6% had a minimum of one stressor, including the death of a loved (16.6%) and financial/work issues (10.8), the loss of a long-term relationship (10.2%), and family problems (7.8%) are among the most traumatic life events (51.0%).

In the present study, females experienced significant stress, anxiety, and depression as compared to males. Sawant et al. [31] looked at gender inequalities in depression and found a greater prevalence of 28 (63.64%) in females compared to 24 (42.86%) in males, which was statistically significant. Also, this could be to keep with according to Abdelmaguid et al. [32], vitiligo has a negative impact on patients' psychological well-being in regards of anxiety and depression, especially in female patients. These findings are consistent with Hamidizadeh et al.'s [5] findings showing that women with vitiligo were more nervous and hopeless than healthy controls, although there was no substantial difference in the degree of tension and hopelessness between the two groups.

With this study, there was no relation between the area involved by vitiligo and psychological disturbances.

Table 1 Demographic and clinical data of study groups

		Patient		**Control**	
Variable		N	%	N	%
Age	Mean± SD	34.69±5.87		30.27±7.65	
Age in years	<40 years ≥40 years	31 19	62.0 38.0	40 10	80.0 20.0
Age of onset	Mean± SD	29.32±7.84			
Gender	Male	14	28.0	16	32.0
	Female	36	72.0	34	68.0
Marital statue	Single	21	42.0	10	20.0
	Married	29	58.0	40	80.0
Family history of vitiligo	Positive	37	74.0		
	Negative	13	26.0		
Work of patients	Student	16	32.0		
	Worker	9	18.0		
	Housewife	25	50.0		
Degree of vitiligo	Mild	20	40.0		
	Moderate	24	48.0		
	Severe	6	12.0		
Possible cause of vitiligo	No obvious cause	14	28.0		
	Death of family member	11	22.0		
	Family member illness	3	6.0		
	Fear	8	16.0		
	Post traumatic	1	2.0		
	Leprosy	3	6.0		
	Pregnancy	2	4.0		
	After delivery	1	2.0		
	Infertility	1	2.0		
	Work problems	6	12		
Type of vitiligo	Acral	3	6.0		
	Focal	12	24.0		
	Segmental	12	24.0		
	Generalized	22	44.0		
	Universal	1	2.0		
Sun-exposed lesions	Unexposed	8	16.0		
	Exposed	34	68.0		
	Both	8	16.0		
Ultraviolet B (UVB) therapy	Negative	21	42.0		
	Positive	29	58.0		
Topical therapy	Negative	22	44.0		
	Positive	28	56.0		
Systemic therapy	Negative	26	52.0		
	Positive	24	48.0		

In agreement with Kota et al. [33], they found that there was no significant correlation between skin area affected by vitiligo and depression. Regarding the effect of vitiligo on quality of life, the majority of cases 46% showed tremendous effect on their quality of life. Also, these results are within the road with Silpa-Archa et al. [34] who

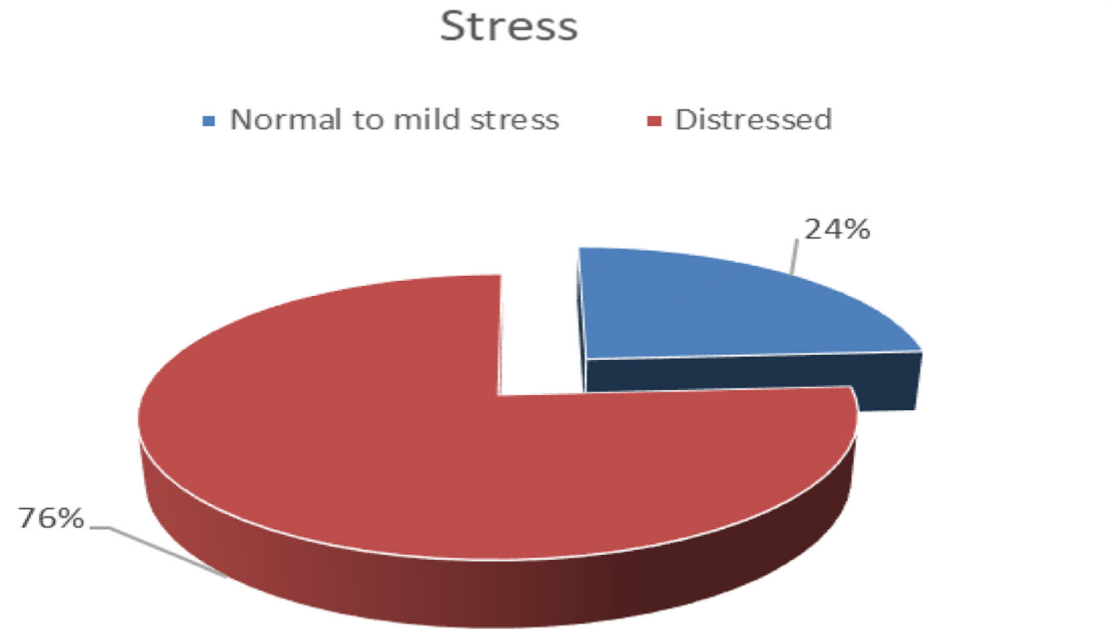

Fig. 1 Percentage of stress

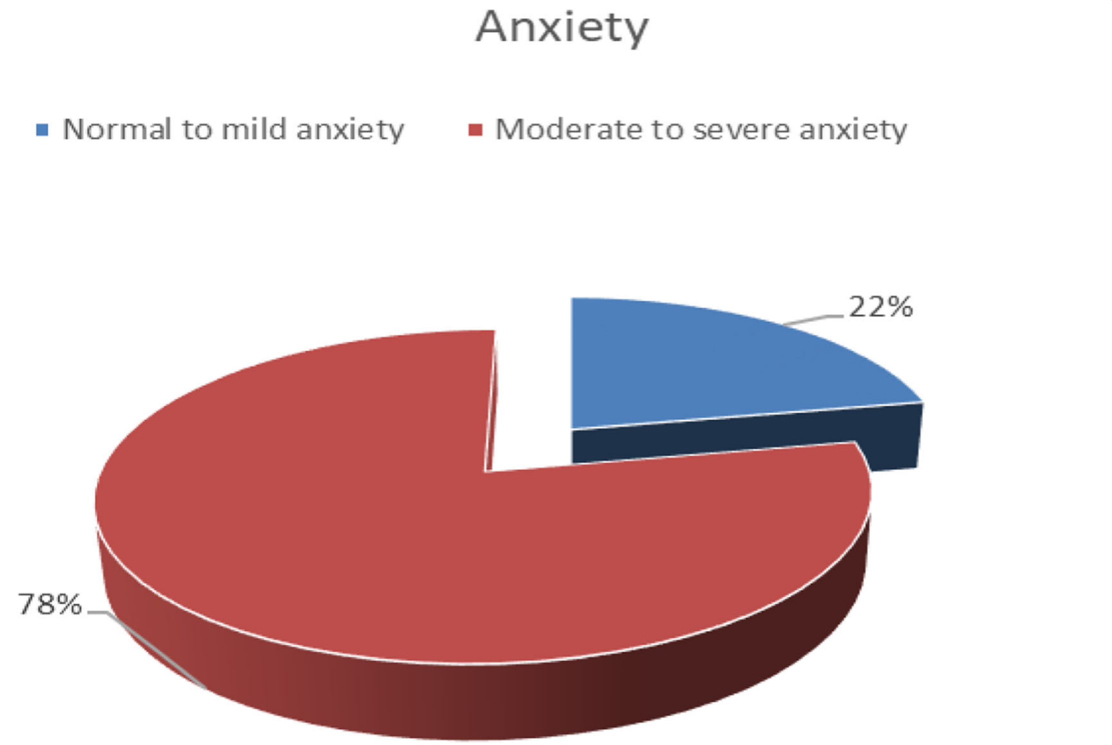

Fig. 2 Percentage of anxiety

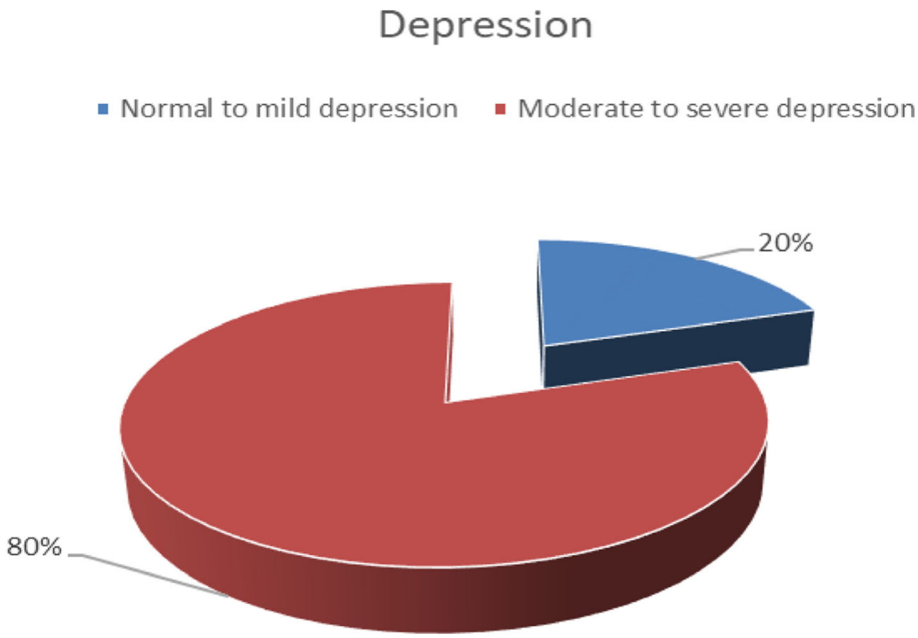

Fig. 3 Percentage of depression

found that in the Thai population, vitiligo caused medium QoL impairment, and there was a moderate incidence of depression. Also, these results are in line with Cupertino et al. [30] who reported that vitiligo sufferers have a moderate DLQI score (range from 4.4 to 17.1), which is similar to psoriasis and atopic dermatitis.

Regarding sexual difficulties and problems with the partner, the present study showed that about 10% had many sexual difficulties. Also, within the current study, about 21% had many problems with their partners. These findings are consistent with those of Cupertino et al. [30] who discovered that roughly 25% of vitiligo patients reported that their condition has damaged their interpersonal relationships. Overall, 10–15% believe that vitiligo has hampered their ability to socialize with people of the opposite gender, as well as their ability to

Table 2 Stress, anxiety, and depression among patients

Variable		N	%		N	%
Stress	Normal	2	4.0	Normal to mild stress	12	24.0
	Mild	10	20.0			
	Moderate	18	36.0	Distress	38	76.0
	Severe	14	28.0			
	Extreme severe	6	12.0			
Anxiety	Normal	2		Normal to mild anxiety	11	22.0
	Mild	9	18.0			
	Moderate	16	32.0	Moderate to severe anxiety	39	78.0
	Severe	10	20.0			
	Extreme severe	13	26.0			
Depression	Normal	4	8.0	Normal to mild depression	10	20.0
	Mild	6	12.0			
	Moderate	14	28.0	Moderate to severe depression	40	80.0
	Severe	12	24.0			
	Extremely severe	14	28.0			

Table 3 Quality of life index in vitiligo patients

Variable		N	%
Skin pain in vitiligous lesions	Not at all	28	56.0
	Little	5	10.0
	A lot	9	18.0
	Very much	8	16.0
Embarrassment of vitiligo	Not at all	10	20.0
	Little	4	8.0
	A lot	12	24.0
	Very much	24	48.0
Clothes choice	Not at all	9	18.0
	Little	4	8.0
	A lot	9	18.0
	Very much	28	56.0
Social activities sharing	Not at all	9	18.0
	Little	6	12.0
	A lot	16	32.0
	Very much	19	38.0
Work and study difficulties	Not at all	14	28.0
	Little	6	12.0
	A lot	19	38.0
	Very much	11	22.0
Problems with your partner	Not at all	30	60.0
	Little	2	4.0
	A lot	3	6.0
	Very much	15	30.0
Sexual difficulties	Not at all	44	88.0
	Little	2	4.0
	A lot	1	2.0
	Very much	3	6.0
Difficulties in vitiligo treatment	Not at all	23	46.0
	Little	4	8.0
	A lot	10	20.0
	Very much	13	26.0
Quality of life index	Small	4	8.0
	Moderate	22	44.0
	Very large	23	46.0
	Extremely large	1	2.0

locate, amount, and frequency of possible or actual sexual interactions. Furthermore, about half of those who were impacted said it was because of their personal humiliation, 13% said it was because of their partner's humiliation, and 37% said it was because of both.

In the present study, 20% have no embarrassment of vitiligo, 8% have little embarrassment, 24% have a lot of embarrassment, and 48% have very much embarrassment. These results are in line with the results of Sarkar et al. [35] who reported that the most common psychiatric morbidity in vitiligo patients was depression (62.29%) followed by embarrassment (55.73%). Regarding clothes choice and social activities, the present study showed that 18% were not plague by vitiligo in clothes choice, 8% vitiligo moderately affected, 18% vitiligo had many effects, and 56% has very much effect. Also, 18% of vitiligo did not affect their social activities, 12% of vitiligo has a little effect, 32% of vitiligo has a lot of effects, and 38% of vitiligo has abundantly affected.

These findings are consistent with Kota et al. [33]; they also found that vitiligo can even pose difficulty in primary daily activities like wearing clothes, having food of their choice, and going to social events. Within this study, there were two patients (4%) who developed vitiligo during pregnancy. This can be in line with Mason et al. [36] who reported that a precipitating factor was identified in nine of their vitiligo patients (22%), including pregnancy, sunburn, and skin trauma. In the present study, there is one patient (2%) who developed vitiligo after delivery, and this is against Delatorre et al. [37] who reported that almost all patients experienced stable vitiligo during pregnancy, still as within the 6-month period after delivery.

During this study, there have been 3 patients (6%) who developed vitiligo after leprosy. This is consistent with the findings of Boisseau-Garsaud et al. [38] who found eleven individuals with vitiligo between 101 patients with lepromatous (multibacillary) leprosy. The link between vitiligo and leprosy was not coincidental. The physiopathology leading to this high rate of vitiligo in leprosy is unclear.

There was no significant correlation between stress, anxiety, and depression and quality of life in patients with vitiligo. This was in line with Hedayat et al. [39] who concluded that psychiatric conditions such as depression and anxiety have no impact on the quality of life in people with vitiligo, while in contrast with Mechri et al. [40] who stated that the quality of life ratings had a positive association with depression and anxiety scores.

Limitations

The limitation of this study is that the study was conducted in a single large university hospital which might not represent all individuals with vitiligo or might not be generalizable to other countries. Although DASS is the standard measurement for screening of depression, anxiety, and stress, its limitation is that it is a self-rated questionnaire. Additional clinical information, e.g., patient's function, effects of medication, illness, and

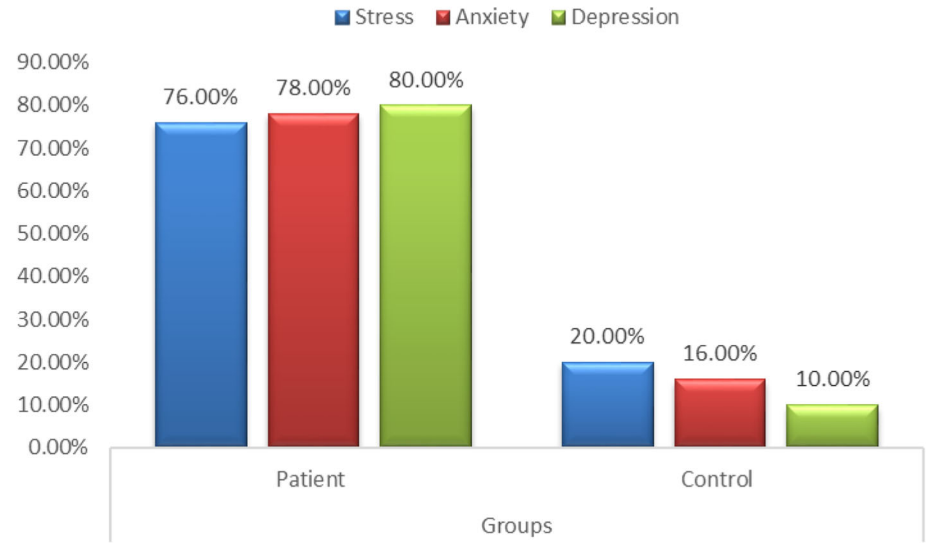

Fig. 4 Comparison between groups regarding stress, anxiety, depression

psychiatric evaluation, are recommended for definite diagnosis and comprehensive evaluation. Furthermore, we did not evaluate patients younger than 12 years old.

Conclusion

Vitiligo patients have a high prevalence of psychiatric comorbidity: stress, anxiety, and depression. The onset of vitiligo is preceded by a stressful situation in most patients. Vitiligo contains a moderate to huge effect on the quality of lifetime of patients in particular (clothes choice and feelings of embarrassment). Female patients with vitiligo are more liable to psychiatric problems than male patients. There is no statistically significant correlation between stress, anxiety, depression, and the quality of life index in vitiligo patients.

Table 4 Correlation between patient's stress, anxiety, depression, and both demographic and clinical data of patients

	Stress		Anxiety		Depression	
	R	P	R	P	R	P
Age	−0.080	0.583	0.006	0.969	0.091	0.528
Age of onset	−0.256	0.073	−0.040	0.785	0.106	0.464
Gender	0.171	0.235	0.314*	0.026	0.245	0.086
Marital statue	−0.041	0.979	0.037	0.798	−0.020	0.889
Family history of vitiligo	0.120	0.408	0.205	0.154	0.296*	0.037
Work	−0.166	0.248	0.017	0.907	0.066	0.649
Degree of vitiligo	0.116	0.424	0.403*	0.002	0.316*	0.025
Cause of vitiligo	0.018	0.903	0.017	0.908	0.016	0.913
Type of vitiligo	0.256	0.741	0.018	0.903	0.106	0.464
Sun exposure	0.015	0.918	−0.146	0.312	−0.053	0.714
UVB therapy	0.091	0.529	0.135	0.350	−0.020	0.889
Topical therapy	−0.026	0.856	0.016	0.915	−0.141	0.329
Systemic therapy	−0.022	0.877	−0.070	0.631	0.180	0.211

*significant *P*value <0.05

Table 5 Correlation between patient's stress, anxiety, depression, and quality of life index

Correlations						
	Stress		Anxiety		Depression	
	R	P	R	P	r	P
Social activities sharing	0.054	0.709	0.017	0.909	−0.258	0.071
Skin pain in vitiligous lesions	−0.072	0.618	0.112	0.440	0.039	0.790
Embarrassment of vitiligo	0.285*	0.045	0.221	0.123	0.084	0.562
Clothes choice	0.330*	0.019	0.134	0.354	0.197	0.170
Quality of life	0143	0.320	0.045	0.757	0.015	0.918
Work and study difficulties	0.005	0.974	0.174	0.227	0.149	0.302
Problems with your partner	0.011	0.939	0.232	0.104	0.060	0.681
Sexual difficulties	0.161	0.265	0.195	0.176	−0.010	0.947
Difficulties in vitiligo treatment	0.099	0.493	−0.005	0.971	0.129	0.371

*significant *P*value <0.05

Abbreviations

DASS: Depression Anxiety Stress Scale; DLQI: Dermatology Life Quality Index; HRQL: Health-Related Quality of Life

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Authors' contributions

MA, SM, ZA, and MR evaluated and interpreted patient data in terms of clinical data and psychometric methods, and all writers contributed to the manuscript's writing. The final manuscript has been read and accepted by all of the contributors.

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Availability of data and materials

Not applicable

Declarations

Ethics approval and consent to participate

The Ethics Committee of Fayoum University's Faculty of Medicine gave their blessing to this study. The participants of the study gave their written informed consent. There is no way to know how many permits there are. The committee's reference number is not applicable and/or not available.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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