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The Relationship between Perceived Stress and Vitiligo

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ABSTRACT

Background and Objective: Vitiligo is a complex skin disorder that manifests itself with colorless spots caused by the destruction of melanocytes and causes psychological disorders in patients. The aim of this study is to investigate the level of perceived stress in vitiligo patients compared to the control group.

Methods: This case-control study was conducted in Razi Hospital affiliated to Tehran University of Medical Sciences from August 2020 to February 2021. 87 vitiligo patients with definite diagnosis (case group) and 130 patients with other skin diseases not related to psychosomatic factors (control group) were selected via convenience sampling and compared with each other in terms of the level of current perceived stress. In this study, the perceived stress was the dependent variable, the clinical type of the disease and the location of the lesion were the independent variables, and the demographic characteristics of the patients were the background variables. The data were collected and compared using a standard questionnaire of perceived stress in which the range of scores is between 0 and 40.

Findings: The average perceived stress in vitiligo patients (19.17±6.24) was higher than other skin patients (16.75±6.96), which was significant by controlling the effect of background variables (Coef.=1.98, CI=0.21-3.75, p=0.02). There was no significant relationship between perceived stress and clinical type and duration of vitiligo. Only the occurrence of genital lesions was related to stress experience (p=0.01). Moreover, with the increase in the level of education, the level of stress in patients decreased (p=0.01).

Conclusion: According to the findings of the present study, suffering from vitiligo can lead to increased stress in patients. Since stress leads to negative effects on resilience and the quantity and quality of the treatment period in various diseases, it is necessary to pay attention to the significance of counseling and psychological support in the treatment plan of vitiligo patients.

Keywords: *Perceived Stress, Vitiligo, A Case-Control Study, Iran.*

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Introduction

Vitiligo is a chronic acquired dyschromia disorder caused by the immune system's invasion of pigmented skin cells. Skin manifestations of the disease are in the form of macules or larger colorless or pale spots in different parts of the body and mucous membranes, and may even involve hair follicles in different areas of the skin, and sometimes with systemic manifestations such as sensorineural deafness, eye inflammation, thyroiditis (1-4). The prevalence of this disease in different parts of the world varies from 1.2% in Oceania to 0.4% in Africa and Europe, 0.2% in South America and 0.1% in Asia. Also, the mentioned disease can appear at any age, but it usually starts between the ages of 10 and 30 and occurs equally in men and women (1, 3, 4).

The clinical appearance of vitiligo disease is diverse and commonly starts from the face and spreads symmetrically to the trunk and has the potential to progress throughout life. In rare cases, the disease asymmetrically involves all or part of a skin segment (1, 4). The pathogenesis of this disease is multifactorial and several possible mechanisms including genetic, biochemical, viral, neurological and autoimmune responses have been suggested in the pathogenesis of the disease. Although the interaction between these factors in the clinical occurrence of the disease is still unknown, there is more agreement on the autoimmune mechanism (1-8). Also, research indicates that in addition to oxidative stress, environmental stressors can also lead to the onset or progression of the disease (9, 10). As a result, vitiligo patients experience severe psychological consequences. The prevalence of psychological complications attributed to the disease has been reported in different studies from 32.6% to 90%, and among these, depression and anxiety have been reported as the most common disorders (0.1%-62.3%) (11-13).

There are several studies in the field of psychological complications associated with and caused by vitiligo disease, especially anxiety and depression (11, 13-17). This is despite the fact that there have been limited studies in this regard in Iran (18, 19). In a study by Karimi et al., suicidal thoughts and stress were investigated in patients (18) and in a study by Hamidizadeh et al., hopelessness, anxiety and depression were investigated in this group of patients (19). In addition, among the effects of the disease on mental health, stress has received less attention. Furthermore, the tool used in this study is used for the first time in Iran to measure the perceived stress in these patients and the level of perceived stress in this group has been compared with other non-psychosomatic skin patients. The present study is a part of a research project whose first phase examined the relationship between the experience of stressful life events as an underlying factor and vitiligo disease, and its results have been published (9). This study was carried out in continuation of a previous study and with the aim of investigating the perceived stress status in vitiligo patients as a consequence of the disease in comparison with other non-psychosomatic skin patients who referred to Razi Dermatology Hospital in Tehran.

Methods

After being approved by the ethics committee of Tehran University of Medical Sciences with the code IR.TUMS.MEDICINE.REC.1398.945, this case-control study was conducted on two groups of vitiligo patients (cases) and other non-psychosomatic skin patients (controls) in Razi Dermatology Hospital affiliated to Tehran University of Medical Sciences. The data of this study were collected from August 2020 to February 2021. The sample size based on the statistical method of estimating the sample size to compare the mean in two communities, considering the significance level of 5%, the power of 90%, and considering the probability of sample dropout of 10%, was estimated as 217 people, and considering case-control ratio of 1.5, the sample size was calculated to be 87 in the case group and 130 in the control group. The samples

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were selected using convenience sampling method. The participants in the research included Iranian people aged 18 to 60 years with vitiligo and other skin diseases not related to psychosomatic factors, whose etiology was previously known definitively. Exclusion criteria from the case group included more than three years since the diagnosis of the disease, suffering from another simultaneous skin disease with autoimmune origin, and suffering from a chronic physical disease such as hypertension, diabetes, cardiovascular diseases, pulmonary diseases, and untreated thyroid disease. Exclusion criteria from the control group included more than one year after diagnosis, suffering from more than one skin disease at the time of the study, suffering from skin diseases of autoimmune origin or having a history of suffering from these diseases and suffering from a chronic physical disease.

After obtaining the necessary permits, the researchers visited the skin clinic of Razi Hospital. While explaining the objectives of the study, ensuring the confidentiality of the information of the participants in the research, obtaining informed consent from them, and having the other criteria for entering the study, the researchers collected data from samples. For this purpose, a questionnaire consisting of two sections was used. The first part included questions to evaluate the demographic characteristics, socio-economic status and health and illness status of the person. The second part was related to measuring the stress perceived by the individual and based on the Persian version of the Perceived Stress Scale (PSS) designed by Cohen et al. in 1983. It includes 10 positive and negative questions with a 5-point Likert scale. It ranges from never (0) to always (4) (20). The range of scores that can be obtained in this questionnaire was between 0 and 40, where a higher score means a higher perceived stress in patients. The validity and reliability of this questionnaire was confirmed in several studies (21, 22). Maroufizadeh et al. confirmed the reliability and validity of this questionnaire in patients with asthma with a Cronbach's alpha of 0.90 and correlation coefficient of 0.699 (22). In addition to the questionnaire, the medical records of the clients were used to collect information related to the course of the disease.

Statistical analysis of data was done using descriptive statistics, which included frequency, and mean and standard deviation, as well as analytical tests including One-way ANOVA, Two-sample T test and Linear Regression Analysis using SPSS version 23, and $p<0.05$ was considered significant.

Results

The mean age of the participants in this study was 35.7±10 years. Most of the participants were male (58.5%), married (60.4%), had high school diploma or higher (82%), urban (95.9%), employed (63.8%), Fars (41%), head of the household (40.1%) and had relatively good economic status (66.8%). Moreover, 40% of all patients were diagnosed with vitiligo, 35% were diagnosed with warts, 14.2% with different types of dermatitis, and 10.6% with keloid scars. Among vitiligo patients, 97.7% had non-segmental vitiligo, 62.7% had generalized vitiligo, 26.4% had focal vitiligo, 9.2% had acrofacial vitiligo, and others had segmental vitiligo.

The mean perceived stress in vitiligo patients (19.1±6.2) was higher than other skin patients (16.7±6.9). Also, in examining the relationship between vitiligo disease and perceived stress using multiple linear regression while controlling the effect of background variables such as demographic and socio-economic characteristics, the results showed that the mean perceived stress in vitiligo patients was 1.98 units higher than the control group (CI=0.21-3.75), which was statistically significant (p=0.02).

There was no significant relationship between the mean perceived stress and the type of vitiligo disease; in other words, there was no significant difference between the mean stress in different types of vitiligo disease (Table 1).

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Table 1. The results of the one-way analysis of variance test to investigate the relationship between the mean perceived stress and the clinical type of vitiligo disease (n=87)

Clinical type of the disease	Generalized	Segmental	Acrofacial
Segmental			
Mean difference	6.1		
p-value	1.00		
Acrofacial			
Mean difference	3.4	-2.63	
p-value	0.81	1.00	
Focal			
Mean difference	3.1	-3.00	-0.38
p-value	0.26	1.00	1.00

In evaluating the relationship between the amount of stress and the location of the lesion in vitiligo disease, there was a significant relationship only in genital lesions; people whose vitiligo lesion was in the genital area experienced less stress than those whose lesion was in a place other than the genital area (p=0.01, mean 20.7±6.5 vs. 17.5±5.5). In other cases, there was no relationship with the level of stress (Table 2).

Table 2. Examining the relationship between the mean perceived stress and the location of the vitiligo lesion (n=87)

Location of the lesion and the state of the conflict	Frequency	Perceived stress Mean±SD	p-value
Head and neck			
Yes	53	18.3±6.3	0.13
No	34	20.4±6.0	
Upper limbs except hands			
Yes	11	20.1±7.3	0.56
No	76	19.0±6.1	
Hands			
Yes	63	19.2±6.2	0.93
No	24	19.0±6.3	
Torso			
Yes	35	18.4±6.1	0.38
No	52	19.6±6.3	
Lower limbs except legs			
Yes	19	18.6±6.6	0.86
No	68	19.2±6.1	
Legs			
Yes	46	18.5±6.4	0.32
No	41	19.8±5.9	
Genital			
Yes	42	17.5±5.5	0.01
No	45	20.7±6.5	

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In evaluating the relationship between the duration of the disease (independent variable) and the level of perceived stress (dependent variable) through the linear regression test, no significant relationship was found (p=0.66, CI=-1.90-1.22, Coefficient=-0.33).

In addition, the relationship between the level of perceived stress and the demographic and socio-economic characteristics of the patients was also investigated through a linear regression test. Based on the results, there was a significant relationship between the level of education and the level of stress, and with the increase in the level of education, the level of perceived stress decreased (p=0.01, CI=-6.32 - -0.75, Coefficient=-3.54). Other personal characteristics such as age, gender, marital status, ethnicity, place of residence, economic status, and head of the household did not show a significant relationship with the level of stress.

Discussion

Based on the findings of the present study, the mean score of perceived stress in vitiligo patients was significantly higher than the control group (other non-psycho-somatic skin patients). As we didn't find a study that is exactly similar to the present study, we have compared the results of our study with other almost similar studies. In some existing studies, a significant difference was observed in the level of stress in patients with vitiligo compared to the control group which included healthy people (15, 18, 23-25). In the study of Nasser et al., a significant relationship between perceived stress in vitiligo patients compared to healthy people was reported (24). In a study by Henning et al., a significant difference was reported in the level of perceived stress in people with vitiligo compared to the control group (10). The results of a study by Manolache et al. showed that 21 people in case group (65.62%) experienced a stressful event in the year leading to the diagnosis of the disease, which was only 7 people (21.87%) in the control group. However, there was no significant difference in the mean number of stressful events in the two groups (26). Since the control groups were diverse in different studies, and considering that the perceived stress does not show the cumulative stress or the number of negative life events, the difference in the results can be justified. However, what is certain is that vitiligo disease is not only a disease with aesthetic aspects and consequences and leads to various psychological complications including increased stress in people (11).

In fact, the results of the present study are consistent with studies which show that environmental and psychological stress are triggers for the onset and progression of vitiligo (10, 27), although the exact mechanisms by which stress affects vitiligo remain unknown (10). One of the reasons for this issue is that psychological stress can initiate the pathogenesis of vitiligo by increasing the level of neuroendocrine hormones and affecting the immune system and changing the level of neuropeptides (28). Also, the possibility of connection between stress and catecholamine base, and the onset or progression of the disease has also been proposed as a scientific justification for this hypothesis (29). In the study of Vernwal et al., it is also stated that patients are faced with a defective vitiligo-stress cycle, and the disease leads to an increase in stress in them and affects their social relationships, and on the other hand, this stress contributes to the progression of the disease (30).

Based on the findings of the present study, there was no significant relationship between the type of vitiligo disease and the location of the lesion (except genital lesions), and between the duration of the disease and the level of perceived stress, which is consistent with the results of the study by Nasser et al. (24). In a study by Henning et al., there was no relationship between the length of illness, the characteristics of the disease, and the extent of involvement with the level of perceived stress (10). This suggests that high perceived stress may not be the result of pigment loss alone. Thus, the data provide further support for stress as a precipitating factor in the development of vitiligo. As perceived stress only reflects current stress and

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does not include cumulative stress or the number of negative life events, this could explain why perceived stress levels were not associated with the duration or characteristics of vitiligo. Overall, the findings make it necessary to conduct more studies on the role of chronic stress in the development of the disease. However, according to the results of Ezzedine et al., the burden of psychological problems is significantly higher if the lesion is located in visible areas and involves a wider surface of the skin (11). The difference in the results can be due to the fact that in the mentioned study, all kinds of psychological problems were examined in general and did not focus on the current perceived stress alone.

In our study, there was no significant relationship between the demographic characteristics of age, gender, marital status, head of the household, ethnicity, place of residence and economic status with the level of current perceived stress in vitiligo patients, which is largely consistent with the study of Nasser et al. (24) and Henning et al. (10) except for the gender variable. Whether women are more aware of their stress or there are other underlying factors that are attributed to their perception is still unclear (10). Therefore, background differences and social context can affect the results, and this issue shows the need to conduct more studies with a larger population. Furthermore, there was a significant relationship between the level of education and the level of stress, and with the increase in the level of education, the level of current perceived stress decreases, which is consistent with the results of the study by Marefat et al. (31). It can be said that people with a higher level of education have more ability and skill to control stress compared to people with a lower level of education, although the variable of education has been examined in a very limited way in the studies conducted on vitiligo patients. The need to investigate this variable on the perceived stress of this group of patients is felt more than ever.

It seems that vitiligo significantly affects the psychological health of patients and induces a lot of stress. Therefore, special attention should be paid to the role and position of combined and multifaceted treatment strategies, especially counseling and psychological interventions in the patient's treatment plan and their follow-up visits.

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