



# A Comparative Analysis of the Frequency of Bipolar Spectrum Disorder in Patients with and Without Psoriasis

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## Abstract

**Background:** Psoriasis is a chronic disease that significantly negatively affects a patient's quality of life. Based on etiopathological characteristics, there is strong evidence of susceptibility to psychological disorders, such as depression and bipolar disorder, in patients suffering from psoriasis.

**Objectives:** We investigated the frequency of bipolar spectrum disorders in psoriasis patients compared to healthy controls in a selected population in Iran.

**Methods:** This case-control study was conducted on two sample groups, with and without psoriasis (50 people in each group). The statistical population included all individuals referred to Shohadaye Tajrish and Taleghani Hospitals of Shahid Beheshti University of Medical Sciences, selected using the available method and assigned to two groups in 2023. The participants were examined for the presence of bipolar spectrum disorders using the Mood Disorder Questionnaire (MDQ) and the Bipolar Spectrum Diagnostic Scale (BSDS).

**Results:** According to the MDQ questionnaire, the frequency rates of bipolar disorder in the patients and controls were 20% and 40%, respectively, with no significant difference between the groups ( $P = 0.108$ ). Based on the BSDS, the frequency of bipolar disorder in the two groups, with and without psoriasis, was estimated to be 25% and 32.1%, respectively, with no significant difference ( $P = 0.226$ ). The rate of major depressive disorders was also 22% and 26%, with no significant difference ( $P = 0.640$ ).

**Conclusions:** Among Iranian patients with psoriasis, the presence of the disease may not be associated with an increased risk of bipolar spectrum disorders.

**Keywords:** Bipolar Disorder, Depression, Psoriasis, Frequency

## 1. Background

Psoriasis is a chronic disease mediated by the human immune system, based on a polygenic vulnerability, with systemic manifestations and significant negative effects on the patient's quality of life (1). Several predisposing factors, such as geographical residence, genetic factors, and environmental conditions, influence the disease. Across different regions, high-income countries and territories displayed the highest

age-standardized incidence rate of psoriasis at 112.6 (95% UI 108.9 - 116.1), with countries having a high-middle socio-demographic index following closely at 69.4 (95% UI 67.1 - 71.9). In contrast, regions with a low socio-demographic index reported the lowest rate at 38.1 (95% UI 36.8 - 39.5). This trend was also apparent when looking at the prevalence and years lived with disability (2, 3).

The results of Zhang et al.'s study indicated that despite the downward trend of the overall burden of

psoriasis in each age group from 1990 to 2019, it is predicted that from 2020 to 2030, the burden of psoriasis will increase in people aged 30 to 39 (4). Since approximately one-third of patients referring to skin clinics show some degree of emotional factors, a new field called psychodermatology has also been created (5). The emotional problems due to skin disease include low self-esteem and poor self-image (5). Skin specialists accept the involvement of psychological issues in the development of skin diseases; however, the diagnosis of the involvement of psychological problems in the development of these diseases may be delayed or may never be made. For this reason, patients do not benefit much from common treatments (6, 7). Overall, ignorance and mental issues lead to incomplete treatment of patients with skin diseases (8).

Psoriasis is a common, often underdiagnosed, and undertreated psychiatric comorbidity skin disorder that is more commonly associated with psychiatric illness than other skin conditions (9). The latest investigations agree on the association between psychological factors and the emergence or aggravation of psoriasis. According to these studies, 37 to 50% of patients have reported exacerbation of disease symptoms following nervous excitement and feeling depressed (10, 11). Nevertheless, psoriasis' psychological origination and stress factors have been reported as the most crucial factors originating or exacerbating the illness process (12). Bipolar disorder is one of the disorders reported in patients with psoriasis (13).

Bipolar I disorder is characterized by the occurrence of at least one lifetime manic episode. Bipolar II disorder, on the other hand, is characterized by the occurrence of at least one hypomanic episode and one depressive episode. The crucial characteristic of mania, based on the diagnostic and statistical manual of mental disorders, fifth edition, text revision (DSM-5-TR), is a distinct period of persistently and abnormally elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy, lasting at least a week and present nearly all day, almost every day (or any duration if hospitalization is necessary) (14). The criteria for hypomania and mania are similar in terms of crucial and further symptomatological characteristics. Based on both the DSM-5-TR and the international classification of diseases, hypomania differs from mania solely based on functional outcome to the extent or degree that it is not severe enough to

cause marked impairment, nor does it require hospitalization or include psychotic features (14).

Bipolar I disorder remains a prevalent, impairing, and highly comorbid condition in both males and females, significantly lowering quality of life and increasing the burden of disease. Patients with bipolar I disorder report lower quality of life compared to individuals without the condition (15). Evidence shows a higher prevalence of bipolar disorder in individuals with medical impairments compared to healthy individuals (16). In the study by Ghanbari Jolfaei et al. (16), the frequency of bipolar disorder based on the Bipolar Spectrum Diagnostic Scale (BSDS) and the Mood Disorder Questionnaire (MDQ) was 20.8% and 12.1%, respectively.

Psoriasis's total physical and psychosocial impairments can affect all aspects of life. Patients with psoriasis and psychiatric manifestations show lower quality of life and incur higher treatment costs than those with only psoriasis (17). Some studies have indicated that using treatment techniques based on psychological fundamentals leads to significant improvement in psoriasis clinical presentations within six weeks of treatment initiation, with effects persisting for six months (18). Since lithium is one of the first-line agents in treating patients with bipolar spectrum disorder and its use exacerbates psoriasis (19), this creates a challenge in treating patients with both bipolar spectrum disorder and psoriasis. Therefore, special attention is needed to address this issue and conduct more studies to solve this problem and understand the importance of integrated treatment for these patients.

Recognition and management of comorbidities such as psoriatic arthritis and psychological diseases are essential for holistic care of individuals with psoriasis (8). Epidemiological studies serve as a guide and inspiration for clinical and basic research and play a crucial role in determining international and national policies. They also help reveal pathology, describe risk factors, define disorders, and provide insight into various aspects of treatment (20). According to the WHO report, one of the key areas of healthcare research is the epidemiology of psoriasis and its global prevalence and incidence (21). As a result, we assessed the frequency of bipolar disorder in the Iranian psoriasis population to fill this research gap.

## 2. Objectives

We investigated the frequency of bipolar spectrum disorders in psoriasis patients compared to healthy controls in a selected population in Iran.

### 3. Methods

#### 3.1. Study Population

The current study was a descriptive, cross-sectional, case-control study. The statistical population included all individuals referred to Shohadaye Tajrish and Taleghani hospitals of Shahid Beheshti University of Medical Sciences. Participants were selected using an available sampling method and assigned to two groups, with and without psoriasis, in 2023. In this study, people with psoriasis referred to the specialized skin clinics of Shahada Tajrish Hospital in Tehran and diagnosed by a dermatologist constituted the case group. The general population, who visited Taleghani Hospital clinics (except psychiatric and psychological clinics) in Tehran, served as the control group.

G Power software was used to estimate the sample size; based on an effect size of 0.8, an alpha of 0.5, and a power of 0.95, it suggested a sample size of 100 people, with 50 in each group (22). By matching the case group with the control group to control for the effect of confounding variables, individuals included in both groups had no history of mental disorders in their personal or family history.

Based on a poster inviting cooperation in the research, individuals willing to participate in the study were contacted and divided into two groups: Those with and without psoriasis. The subjects were consecutively recruited at the dermatology clinic, where they were informed about the study's objectives and signed informed consent forms.

In our study, 191 patients were initially evaluated. After assessment by a dermatologist and a psychiatric resident, according to the exclusion and inclusion criteria, 50 individuals were placed in each group.

The inclusion criteria included informed consent to participate in the research, not suffering from severe mental disorders (including psychosis, major depressive disorder, suicidal thoughts, substance abuse, or dependence), and not suffering from any physical disease inhibiting cooperation in the study. The exclusion criteria were incomplete or partially completed questionnaires and random answers on the answer sheet (verified by inserting a deviation question

in the middle of each questionnaire, instructing participants to choose "I know" in the "I agree" option).

#### 3.2. Assessments

##### 3.2.1 Structured Clinical Interview for DSM-5-Research Version

This scale is a guide for semi-structured interviews for the major DSM-5 diagnoses. The task is carried out by a skilled clinician or healthcare professional who is knowledgeable about the classification of disorders and diagnostic criteria in DSM-5 (23). The SCID-5-RV is generally administered in a single 45 - 90 minute session (24). The research version contains more disorders than the clinician version (25). Several studies have shown that the SCID-5-RV has acceptable reliability and validity (23). The SCID-5-RV Persian version demonstrated an acceptable range for kappa reliability (0.57 - 0.72), internal consistency (0.95 - 0.99), and test-retest reliability (0.60 - 0.79) (26).

##### 3.2.2 Mood Disorder Questionnaire

The MDQ has 15 items and can identify those likely to suffer from bipolar disorder. This tool helps with the identification of bipolar disorder and differentiation from other mood disorders in clinical groups (27). An overall score for items 1 - 13 is estimated with "Yes" and "No" responses scored as 1 and 0, respectively.

The percentage of endorsed items (raw score/number of items × 100) is calculated to indicate the percentage of symptoms identified by the respondent. To fulfill the bipolar disorder threshold, the following traditional scoring technique is used: (1) a score of 7 or higher on items 1 - 13 (2) checking "Yes" for the item asking if the symptoms are grouped at the same time (3) symptoms cause either moderate or serious impairment.

Masaeli et al. reported the psychometric characteristics of the MDQ's Persian version (28). In this research, Cronbach's alpha was 0.81.

##### 3.2.3 The Bipolar Spectrum Diagnostic Scale

The BSDS is a self-assessment scale developed and revised by Pies et al. (29). The BSDS score ranges from 0 to 25. The first part consists of 19 sentences that narrate the major symptoms of bipolar spectrum disorders. The second part includes a discriminant item assessing how well the first part describes the respondent's

experiences, with scores ranging from zero (does not describe me at all) to six (fits me perfectly). According to Shabani et al. (30), the specificity and sensitivity of the BSDS for screening bipolar disorders are 0.85 and 0.76, respectively. This tool has been validated in Iran (30).

### 3.3. Data Analysis

Quantitative variables were described as mean  $\pm$  standard deviation. Percentages were used to present categorical variables. The *t*-test or Mann-Whitney U test was performed to compare quantitative variables, while the chi-square test was utilized to compare qualitative variables. A multivariable logistic regression model was employed to assess the difference in psychological state between the two groups with and without psoriasis. Analyses were conducted using SPSS 28 software, with a *P*-value  $< 0.05$  regarded as significant.

### 3.4. Ethical Considerations

The Ethics Committee of Shahid Beheshti University of Medical Sciences approved this research (IR.SBMU.MSP.REC.1399.594). The patients signed written informed consent.

## 4. Results

This study was conducted on two groups, including 50 psoriasis patients and 50 controls. Regarding baseline parameters (Table 1), no difference was found between the groups in mean age and gender; however, patients with psoriasis had a lower level of education ( $P = 0.035$ ).

Concerning the psychological state, Table 2 shows no difference between the two groups regarding the history of psychiatrist visits or use of psychiatric medication, family history of psychiatric disorder, history of depression caused by pregnancy, duration of depression of more than one month, number of depressive episodes, frequency of antidepressant use, age of onset of first depression, frequency of hyperthymic cases, history of suicide attempts, history of atypical depression states, and history of psychotic depression. According to the MDQ, the frequency of bipolar disorder in the two groups with and without psoriasis was 10 (20%) and 20 (40%) subjects, respectively, indicating no significant difference between the groups ( $P = 0.108$ ). Based on the BSDS, the frequency of bipolar disorder in the two groups with and without psoriasis was 9 (25%) and 9 (32.1%) subjects,

respectively, also indicating no statistically significant difference between the groups ( $P = 0.226$ ). Moreover, major depression (MDD) was reported in 11 (22%) and 13 (26%) cases, respectively, with no significant difference between the groups ( $P = 0.640$ ).

The relationship between bipolar disorder and psoriasis was investigated using logistic regression. Since it was found in the preliminary analyses that education ( $P = 0.035$ ,  $df = 3$ ,  $\chi^2 = 10.356$ ) is also related to psoriasis, this variable was included in the equation to control for its confounding effect. The logistic regression results showed that only the education level variable had a significant correlation with psoriasis (*P*-value  $< 0.05$ ) (Table 3). Other predictive variables (MDQ, MDD, history of depression caused by pregnancy, and frequency of hyperthymic cases) did not show a significant correlation with psoriasis (*P*-value  $> 0.05$ ).

## 5. Discussion

The occurrence of psychiatric disorders is commonly observed in autoimmune diseases, and it appears that these disorders have a close relationship with the aggravation of the clinical condition of these diseases (31). Among patients diagnosed with psoriasis, a variety of mental disorders, such as mood disorders, including bipolar disorder, sleep disorders, and even schizophrenia and psychosis, are reported (13). Based on etiopathological characteristics, there is a strong correlation between psychosocial factors and a genetic predisposition to psychiatric disorders in patients with psoriasis. As a result, the occurrence and severity of mental disorders in psoriasis patients vary across different societies. Therefore, the current investigation studied the frequency of bipolar spectrum disorders in an Iranian psoriasis sample.

To compare the incidence of psychiatric disorders, two groups of individuals, including patients with psoriasis and a control group without psoriasis, were selected and evaluated using the MDQ and BSDS tools. The main finding of the study was that the case and control groups did not significantly differ in bipolar spectrum disorder and MDD. Additionally, the two groups did not differ in various underlying psychiatric characteristics, such as a history of depression in oneself or family, episodes of mania, duration or number of depressive episodes, psychotic depression, hyperthymia, atypical depression, suicide attempts, or psychoactive drug use. In other words, in the selected population of Iranian patients with psoriasis, the

**Table 1.** The Demographic Characteristics of Participants <sup>a</sup>

Variables	With Psoriasis	Without Psoriasis	P-Value
Age (y)	41.10 ± 13.67	37.24 ± 14.03	0.207
<b>Gender</b>			<b>0.836</b>
Male	31 (62.0)	32 (64.0)	
Female	19 (38.0)	18 (36.0)	
<b>Educational level</b>			<b>0.035</b>
Undergraduate	20 (40.0)	6 (12.0)	
Diploma	14 (28.0)	22 (44.0)	
Associated	4 (8.0)	5 (10.0)	
Bachelor	9 (18.0)	12 (24.0)	
Master	3 (6.0)	5 (10.0)	

<sup>a</sup> Values are expressed as No (%) or mean ± SD.

**Table 2.** Psychiatric Features in Two Groups with and Without Psoriasis Disorder

Variables	With Psoriasis	Without Psoriasis	P-Value
A history of visits by a psychiatrist or taking psychiatric medication	20 (40)	12 (24)	0.086
Family history of psychiatric disorder	16 (32)	8 (16)	0.886
History of depression caused by pregnancy	2 (4)	2 (4)	1.000
The duration of depression is more than one month	10 (20)	13 (26)	0.246
<b>Number of depressive episodes</b>			<b>0.408</b>
One	0 (0)	1 (2)	
Two	6 (12)	9 (18)	
Three or more	5 (10)	2 (4)	
<b>Age of onset of first depression(y)</b>			<b>0.212</b>
10 - 20	4 (8)	4 (8)	
20 - 30	2 (4)	7 (14)	
30 - 40	3 (6)	0 (0)	
40 - 50	1 (2)	1 (2)	
<b>Frequency of antidepressant use</b>	11 (22)	12 (24)	<b>0.812</b>
The frequency of cases is high	7 (14)	10 (20)	0.424
Frequency of hyperthymic cases	8 (16)	6 (12)	0.564
Family history of high temperament	8 (16)	7 (14)	0.779
A history of suicide attempts	3 (6)	2 (4)	0.646
The frequency of switch cases with the use of antidepressants	3 (6)	4 (8)	0.695
History of atypical depression cases	4 (8)	4 (8)	1.000
History of psychotic depression cases	1 (2)	0 (0)	0.999
Frequency of bipolar disorder (MDQ)	10 (20)	20 (40)	0.108
Frequency of bipolar disorder (permanent)	9 (18)	9 (18)	0.226
Frequency of major depressive disorder	11 (22)	13 (26)	0.640

presence of this disease was not linked to an increased risk of bipolar spectrum disorder.

To address the possibility that background characteristics such as gender, age, or education level influenced the conclusions, multivariate logistic regression was used to adjust for these factors. The results still indicated that the psoriasis and control

groups did not differ in the frequency of bipolar spectrum disorder.

Therefore, it seems that the occurrence of psoriasis in Iranian society is not associated with an increased risk of simultaneously suffering from bipolar spectrum disorders. Two important discussions arise from this finding. First, there is a strong correlation between

**Table 3.** Logistic Regression Analysis Evaluating Potential Factors Affecting Bipolar Spectrum Disorder

Variable	B	SE	Wald	OR (95% CI)	P-Value
Level of education (undergraduate)	1.715	0.866	3.921	5.57 (1.01 - 30.33)	0.048

<sup>z</sup>Abbreviations: SE, standard error; OR, odds ratio; CI, confidence interval.

psychosocial factors and genetic predisposition to psychological disorders in patients with psoriasis (13, 32-34). Considering the significant racial, socio-cultural, and genomic differences between Iranians and other societies, the difference between our findings and those of other studies can be justified. Second, our results might be affected by interfering and confounding factors such as the number of study samples, the duration of psoriasis, its clinical severity, and the criteria for including patients in the study. It is possible that the duration of psoriasis can cause psychiatric disorders, and perhaps in our study, the duration of the disease was shorter than in other studies. Additionally, the sample size of our study was much smaller than that of other studies.

In a supplementary investigation, only participants from the case and control groups who provided their contact numbers were further evaluated using a questionnaire to investigate the frequency of bipolar spectrum disorder. In a systematic review and meta-analysis by Chen et al. (35), the incidence of bipolar disorder in patients with autoimmune diseases was much higher than in patients without such diseases, which was not consistent with our study. Interestingly, there was no evidence of analysis of published studies in Iran in their review. In Leisner et al.'s (36) study on 13,675 patients with psoriasis, the 5- and 10-year incidences of mental disorders were estimated to be 2.6% and 4.9%, respectively. Compared to the community control group, the risk of mental disorders in these patients was 1.75, which is significantly different from the present study both in terms of sample size and the prevalence number calculated for psychiatric disorders.

In the study by Liu et al. (37), the incidences of depression, anxiety, and suicide were 42.1, 24.7, and 2.6 per 1000 person-years in patients with psoriasis. In Luna et al.'s (38) study, the prevalence of depression in psoriasis patients was 74.6%, which was significantly higher than the findings of the present study. Therefore, in general, the frequency of bipolar spectrum disorder in the context of psoriasis varies significantly across

different societies, emphasizing the relationship between cultural and social characteristics as well as genetic backgrounds with bipolar disorder.

### 5.1. Conclusions

Despite some limitations, this study has important implications for clinical practice. Psoriasis is a chronic disease, and incorporating the biopsychosocial model in managing and treating this condition is likely necessary. The relationship between mental stress and the clinical course of psoriasis is complex and not yet fully understood. In conclusion, the frequency of bipolar disorders and major depression in individuals with psoriasis in Iranian society is estimated to be 26% and 22%, respectively, which does not show a significant difference from people without psoriasis. Therefore, it seems that in our society, having psoriasis may not be an underlying risk factor for bipolar spectrum disorder.

We faced limitations in this research, the most important of which were constraints due to resources and time. These limitations prevented us from following a sufficiently large population. As a result, we could not manage the sample size optimally, and it is recommended to include a larger population in future studies. Additionally, since this study had a retrospective design, future research should consider a prospective approach. Finally, the available sampling method may potentially bias the results; it is suggested that future studies use random sampling methods.

### Footnotes

**Authors' Contribution:** S.B, conceived and designed the evaluation and drafted the manuscript; M.S and S.S, participated in designing the evaluation, performed parts of the statistical analysis and helped to draft the manuscript; S.M, J.S, re-evaluated the clinical data, revised the manuscript and performed the statistical analysis and revised the manuscript, S.M and KH. Z, collected the clinical data, interpreted them and revised the manuscript; S.S, re-analyzed the clinical and

statistical data and revised the manuscript. All authors read and approved the final manuscript.

**Conflict of Interests Statement:** The authors declare no conflicts of interest.

**Data Availability:** The dataset utilized in the study can be obtained upon request from the corresponding author during submission or following publication. The data is not publicly accessible due to privacy and ethical considerations.

**Ethical Approval:** This study is approved under the ethical approval code of [IR.SBMU.MSP.REC.1399.594](https://doi.org/10.1111/bjd.17331).

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