OPEN ACCESS
https://doi.org/10.70905/bmcj.06.02.0546
ORIGINAL ARTICLE

A FREQUENCY OF ANXIETY AND DEPRESSION IN PATIENTS WITH MODERATE TO SEVERE CHRONIC PLAQUE PSORIASIS

Iqbal Hassan Khan[1], Nimatullah Khan[2], Amana Asad[3], Taimor Nawaz[4], Faisal Nadeem[5]

[1]Senior Registrar, Department of Dermatology, Khalifa Gul Nawaz Teaching Hospital, Bannu, Pakistan
[2]Associate Professor and Head, Department of Dermatology, Khalifa Gul Nawaz Teaching Hospital, Bannu, Pakistan
[3]Consultant Dermatologist, Department of Dermatology, Khalifa Gul Nawaz Teaching Hospital, Bannu, Pakistan
[4]Registrar, Department of Dermatology, Khalifa Gul Nawaz Teaching Hospital, Bannu, Pakistan
[5]Demonstrator, Department of Community Medicine, Bannu Medical College, Bannu, Pakistan

Correspondence:
Dr. Nimatullah Khan,
Email: naimat.derma@gmail.com

Abstract

Background: Psoriasis is a chronic inflammatory skin disorder that often leads to psychological distress. Patients with moderate to severe chronic plaque psoriasis are at risk of anxiety and depression, which can negatively affect their quality of life and treatment outcomes. However, data on psychiatric comorbidities in Pakistani patients are limited. Psoriasis is a chronic inflammatory skin disorder that can cause significant psychological distress. Patients with moderate to severe chronic plaque psoriasis are at increased risk of anxiety and depression, which may negatively affect quality of life and treatment outcomes. Data on psychiatric comorbidities among Pakistani patients are limited, highlighting the need for local research.

Objective: To determine the prevalence of anxiety and depression in patients with moderate to severe chronic plaque psoriasis.

Material and Methods: This cross-sectional study was conducted In the Dermatology Unit of Khalifa Gul Nawaz Teaching Hospital, Bannu, from March 15, 2024, to September 15, 2024. Total 146 patients aged 15-70 years with a Psoriasis Area and Severity Index (PASI) ≥ 7 were recruited through the consecutive sampling method. Patients who had severe comorbid illnesses or psychiatric disorders besides depression and anxiety were not allowed were excluded from the study. The severity of psoriasis was evaluated clinically, and anxiety and depression were determined using the Hospital Anxiety and Depression Scale (HADS). SPSS v25.0 was used to analyze data. Frequencies and percentages were shown to represent categorical variables whereas means +- SD represented continuous variables. The chi-square tests were used to assess the associations with $p \leq 0.05$ as significant.

Results: Among 146 patients, 16 (11.0%) had depression and 28 (19.2%) had anxiety. Depression was more common in females (14)(17.1% vs.(2)3.1% in males)p=(0.007), high-income individuals (12)(22.6%),(p=0.003) and illiterate patients (9)(18.8%)(p=0.021). Anxiety was higher in males (26.6%) and most frequent in the middle-income group (35.9%). Age, disease duration, and occupation were not significantly associated p>0.05 with either condition.

Conclusion: Anxiety and depression are common in a large percentage of patients with chronic plaque psoriasis. The findings indicate the significance of psychosocial assessment and intervention in the daily dermatological practice.

Keywords: Psoriasis, Chronic Plaque Psoriasis, Depression, Anxiety, HADS.
Cite this article: Khan H I,khan N,Asad A,Nawab T,Faisal N .A Frequency of Anxiety and Depression in Patients with Moderate to Severe Chronic Plaque Psoriasis. BMC J Med Sci. 2025; 6(2):88-93 https://doi.org/10.70905/bmcj.06.02.0546

Introduction:

Psoriasis is a chronic immune-mediated inflammatory skin disease that is characterized by scaly and grotesque erythematous plaques with an overflow mostly on the scalp, the trunk, and the extensor sites [1]. Its prevalence rate is approximately 2-3% of the global population and it is one of the key dermatological disease that is highly morbid [2]. The combination of genetic, immunological, and environmental factors is a complicated cause of this disease [3].Though psoriasis is not fatal, its recurring nature, noticeable lesions, and stigma impact a person psychologically and result in a poor quality of

Authorship Contribution: [1,5]Substantial contributions to the conception or design of the work; or the acquisition, Data analysis, Literature review, [2]Drafting the work or revising it critically for important intellectual content, [3,4,6]Final approval of the version to be published, Topic Selection & Supervision

Funding Source: none
Conflict of Interest: none

Received:March,10, 2025
Accepted:Nov,26, 2025
Published: Dec30,12,2025

life [4].

Psoriasis has been recognized as a psychological burden that is becoming popular in recent years. Patients often feel embarrassed, socially withdrawn and very self-conscious particularly when the lesions are in sight. All of these aspects tend to warrant perceived stigmatization, body image issues, and problems in interpersonal relationships [5]. Among the most frequent comorbidities in the psychiatric group are anxiety and depression, which may also aggravate the severity of the disease by mediating stress-related immune dysregulation [6]. Psoriasis and psychological distress are bi-directional such that stress may cause disease exacerbations, and the disease can cause emotional stress which feeds off itself into a self-perpetuating loop [7].

Biologically, psoriasis is characterized by excessive growth of keratinocytes, T-cell-mediated abnormalities and increased concentrations of proinflammatory cytokines, such as TNF-a, IL-17, and IL-23 [8]. The stress reactions contribute to the activation of the hypothalamic-pituitary-adrenal axis and sympathetic nervous system, leading to the rise of cortisol and catecholamine, which worsen the inflammation of psoriasis [9]. This gives it a quantifiable neuroimmunological explanation of the psychosomatic connection seen in psoriasis [10].

The disease has impacts on psycho social functioning and general well-being [11]. Persistence and apparent disfigurement may lead to frustration, despair and social rejection [12]. In particular, depression and anxiety are some of the most frequent ones; prevalence rates are much higher than among the general population; some studies have reported up to 60 per cent prevalence rates [13]. It may have further effects on those outcomes which are culturally and socially dependent and in Pakistan where social stigma is deeply rooted, such psychological effects can be even more significant [14].

Research Gap and Objective: Although international studies have established a strong association between psoriasis and psychiatric comorbidities, local data from Pakistan remain limited. This study aims to determine the prevalence of anxiety and depression among patients with moderate to severe chronic plaque psoriasis.

Material and Method:

Place and Duration: This cross-sectional study was conducted In the Dermatology Unit of Khalifa Gul Nawaz Teaching Hospital, Bannu, one of the major tertiary care centers in Pakistan, where patients are referred from across the country province The research was conducted within six months, From March 15, 2024, to September 15, 2024.

Study Design:. The purpose of the study was to determine the prevalence of anxiety and depression among patients with moderate to severe chronic psoriasis of the plaque. chronic plaque psoriasis .

Sample size Calculation: The sample size was calculated with the use of the world health organization (WHO) sample size calculator: to estimate a single proportion:

$$n = Z^2 2p(1-p)/d^2$$

The parameters involved 95 percent confidence level, 5 percent absolute precision and a prevalence of anxiety among psoriatic patients of 10.6 percent as indicated by the prior studies. This gave a minimum sample size of 146 patients which is the required sample to perform this calculation and all the patients were enrolled in the study.

Sampling Technique:A non-probability consecutive approach was employed in the recruitment of the participants. All patients that fulfilled the inclusion criteria attending the outpatient department or admitted to the dermatology ward between the study period were invited to take part until the target sample size was reached.

Inclusion and Exclusion Criteria: The responses of both genders aged between 15 and 70 years with clinical diagnosis of chronic psoriasis and Psoriasis Area and Severity Index (PASI) score of ≥7 were to be included. Responses from both male and female patients aged 15–70 years, with a clinical diagnosis of chronic psoriasis and a Psoriasis Area and Severity Index (PASI) score ≥7, were included in the study. Patients who had severe systemic illnesses, like congestive cardiac failure, stroke, end-stage renal disease, decompensated liver disease or chronic obstructive pulmonary disease, were excluded. Those who had severe psychiatric conditions other than anxiety or depression were also not included to come up with the right measure of the psychological consequences of psoriasis.

Data Collection Procedure: Process of collecting data: The eligible patients were contacted during regular clinical visits or hospital admission. Written Informed consent was written taken following the explanation of the study objectives. Each participant was clinically assessed in details to verify the diagnosis and to evaluate the severity of the disease on the basis of PASI. The measurement of anxiety and depression was completed with the help of the Hospital Anxiety and Depression Scale (HADS), a 14-item questionnaire that is validated and tested in hospitals.

Anxiety is measured using seven items (HADS-A) and depression is measured using seven items (HADS-D) with a scale ranging between 0 and 21 per subscale. A score of 0-7 denotes no case, 8-10 slight, 11-14 moderate and 15-21 severe anxiety or depression. The questionnaire was administered to the participants as guided in order to make sure they were understood and correct. Sociodemographic and

clinical data were gathered along with age, gender, disease duration, education, occupation and socioeconomic status. The socioeconomic class was divided into low (less than 15,000 PKR), middle (15,000-50,000 PKR), and high (more than 50,000 PKR) based on the monthly household income.

Data Analysis: The data were inputted into and analyzed by the use of SPSS version 25.0. Quantitative variables as age and PASI score were presented in the mean ± SD, whereas qualitative variables, including gender, education, occupation, socioeconomic status, anxiety, and depression, were demonstrated in frequencies and percentages. To measure their relationship with anxiety and depression, effects modifiers such as age, gender, disease duration, education, occupation and socioeconomic status were stratified. To evaluate the statistical significance, the chi-square test was used and p-values ≤0.05 are taken to be significant.

Ethical Issues: The investigation was approved by the Institutional Review Board (IRB) of Khalifa Gul Nawaz Teaching Hospital, Bannu. All respondents signed informed consent forms, and confidentiality of patients in the study was ensured. Individuals who were found to be having clinically significant anxiety or depression were counseled and sent to a psychiatrist to be assessed further and dealt with.

Ethical Considerations: The study ethical approval was approved by the Institutional Review .The study was approved by the Institutional Review Board (IRB) of Khalifa Gul Nawaz Teaching Hospital, Bannu. All respondents signed informed consent forms, and confidentiality of patients in the study was ensured. Individuals who were found to be having clinically significant anxiety or depression were counseled and sent to a psychiatrist to be assessed further and dealt with.

Results:

The participants were 146 patients having a moderate and severe chronic plaque psoriasis. As shown in Table 1, out of them, 64 (43.8%) were male, and 82 (56.2%) were female. The average age of the respondents was 44.3 +- 8.7 years. Most of the patients were aged 15-30 years (37.7%), then 31-40 years old (33.6%) and above 40 old age (28.8%). The period of disease was different with 36. 3% of the patients having less than a year of psoriasis, 34.9% one to two years and 28.8% over two years. On the issue of socioeconomic status, 37.0% of the participants were in low-income earners, 26.7% in the middle-income earners, and 36.3 among high-income earners. Regarding education level, 32.9% were illiterate, 30.8% were middle-educated and 36.3% had graduated or attended higher education. Occasionally, 13.0% of them were students, 68.5% were employees, and 18.5% were not.

Variable	Category	Frequency	Percentage (%)
Gender	Male	64	43.8
	Female	82	56.2
Age (years)	15–30	55	37.7
	31–40	49	33.6
	>40	42	28.8
Duration of disease	<1 year	53	36.3
	1–2 years	51	34.9
	>2 years	42	28.8
Socioeconomic Status	Low (<15,000 PKR)	54	37.0
	Middle (15–50,000 PKR)	39	26.7
	High (>50,000 PKR)	53	36.3
Education	Illiterate	48	32.9
	Middle	45	30.8
	Matric or higher	53	36.3
Occupation	Student	19	13.0
	Employed	100	68.5
	Unemployed	27	18.5

As illustrated in Figure 1, based on the Hospital Anxiety and Depression Scale (HADS), 16 patients (11.0%) with moderate to severe chronic plaque psoriasis and 28 patients (19.2%) with anxiety were found to have depression and anxiety, respectively, among the 146 patients with this condition. These findings underline the necessity of routine mental health screening and support in this population, as a significant percentage of psoriasis patients experience psychological distress.

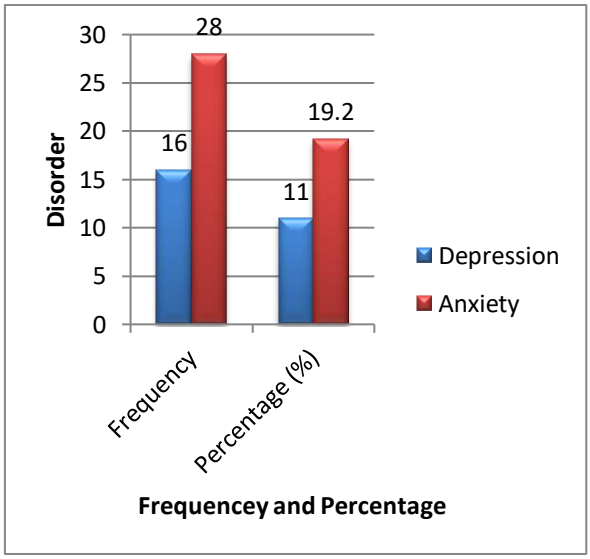

Figure 1: Frequency of Depression and Anxiety

As presented in Table 2, the prevalence of depression was significantly higher among female patients

(17.1%) compared to males (3.1%) (χ^2 = 7.36, p = 0.007). Depression was also more common in the high-income group (22.6%) compared to the low-income (3.7%) and middle-income groups (5.1%) (χ^2 = 11.62, p = 0.003). In terms of educational status, illiterate patients showed a higher frequency of depression (18.8%) than those with middle-level education (13.3%) or matriculation and higher education (1.9%) (χ^2 = 7.69, p = 0.021).

Table 2: Association of Depression with Gender, Socioeconomic Status, and Education

Variable	Category	Depression Yes n (%)	Depression No n (%)	χ^2	p-value
Gender	Male	2 (3.1%)	62 (96.9%)	7.36	0.007
	Female	14 (17.1%)	68 (82.9%)		
Socioeconomic Status	Low	2 (3.7%)	52 (96.3%)	11.62	0.003
	Middle	2 (5.1%)	37 (94.9%)		
	High	12 (22.6%)	41 (77.4%)		
Education	Illiterate	9 (18.8%)	39 (81.3%)	7.69	0.021*
	Middle	6 (13.3%)	39 (86.7%)		
	Matric or higher	1 (1.9%)	52 (98.1%)		

Among the 146 patients with moderate to severe chronic plaque psoriasis, 28 individuals (19.2%) were found to have anxiety. As shown in Figure 2 and Table 3 , anxiety was significantly more common in males (17/64, 26.6%) than in females (11/82, 13.4%) (χ^2 = 4.03, p = 0.045). Socioeconomic status was also significantly associated with anxiety, with the middle-income group exhibiting the highest prevalence (14/39, 35.9%) compared to the low-income (9/54, 16.7%) and high-income groups (5/53, 9.4%) (χ^2 = 10.55, p = 0.005). These results suggest that both gender and socioeconomic status are key factors influencing psychological distress among patients with psoriasis.

Table 3: Association of Anxiety with Gender and Socioeconomic Status

Variable	Category	Anxiety Yes n (%)	Anxiety No n (%)	χ^2	p-value
Gender	Male	17 (26.6%)	47 (73.4%)	4.03	0.045
	Female	11 (13.4%)	71 (86.5%)		
Socioeconomic Status	Low	9 (16.7%)	45 (83.3%)	10.55	0.005
	Middle	14 (35.9%)	25 (64.1%)		
	High	5 (9.4%)	48 (90.6%)		

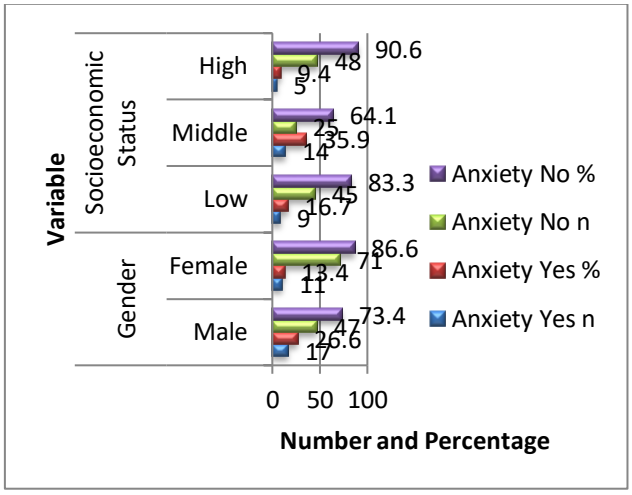

Figure 2: Association of Anxiety with Gender and Socioeconomic Status

Stratification of depression and anxiety by age, disease duration, and occupation showed no significant associations. As shown in Table 4, depression prevalence was 9.1%, 10.2%, and 14.3% across age groups 15–30, 31–40, and >40 years (χ^2 = 0.70, p = 0.704), while anxiety affected 18.2%, 22.4%, and 16.7% (χ^2 = 0.57, p = 0.762). By disease duration, depression occurred in 9.4%, 7.8%, and 16.7% of patients with <1 year, 1–2 years, and >2 years of disease, and anxiety was 17.0%, 21.6%, and 19.0% (p > 0.05). Unlike anxiety which stood at 15.8, 20.0, and 18.5, respectively, depression occupied by occupation stood at 5.3 among students, 11.0 among employed and 14.8 among unemployed participants (p > 0.05). These results indicate that the relationship between depression or anxiety in this group was not found to be significant with age, illness duration, and occupation.

Table 4: Stratification of Depression and Anxiety with Age, Duration, and Occupation

Variable	Category	Depression n (%)	Anxiety n (%)	χ^2 (Depression)	p-value (Depression)	χ^2 (Anxiety)	p-value (Anxiety)
Age	15–30	5 (9.1%)	10 (18.2%)	0.70	0.704	0.57	0.762
	31–40	5 (10.2%)	11 (22.4%)				
	>40	6 (14.3%)	7 (16.7%)				
Duration	<1 year	5 (9.4%)	9 (17.	2.03	0.361	0.3	0.838

			0%)			6	
	1–2 years	4 (7.8%)	11 (21.6%)				
	>2 years	7 (16.7%)	8 (19.0%)				
Occupation	Student	1 (5.3%)	3 (15.8%)	1.04	0.594	0.19	0.909
	Employed	11 (11.0%)	20 (20.0%)				
	Unemployed	4 (14.8%)	5 (18.5%)				

Discussion:

This study showed that psychiatric comorbidities were a significant percentage of those having moderate to severe chronic plaque psoriasis with anxiety reported by 19.2% and depression symptoms observed in 11.0% of the respondents. Similar trends have been reported internationally, including a Chinese cross-sectional study [15] and a systematic review [16], indicating that psychological distress is a consistent component of psoriasis. These findings suggest that routine mental health assessment should be part of clinical management. Males were more prone to anxiety whereas females were prone to depression. This gender pattern aligns with international evidence, as male patients were more prone to anxiety while females were more prone to depression [15].These findings highlight the need for gender-sensitive psychological screening in psoriasis care There were no significant correlations between age, period of illness, and occupation and either condition, but there were significant correlations between socioeconomic status and education level.The findings highlight that psoriasis needs to be treated not only by its physical effects but also by its psychosocial aspects.

The results of the anxiety and depression are agreeable with the more general results that indicate that psychological distress is commonly related to psoriasis [16]. Emotional instability, low self-esteem, and social discomfort are caused by long-term visible lesions, particularly those that happen on exposed places and all of these are leading to the possibility of mental illness [17]. Women appeared to be more susceptible to depression but maybe due to body image and perceived social stigma but men had a higher likelihood of anxiety, which is possibly due to cultural and societal pressures [18].

As anxiety and depression rates were more common among patients of this study that were having middle- and high-income incomes, the socioeconomic status became one of the important factors [19]. The same outcome is consistent with the studies that showed that individuals who have a higher degree of engagement in their social or professional life may experience increased psychological pressure due to their perceived social expectations [20]. Similarly, depression rates were also attributed to poor educational level, perhaps due to the lack of coping strategies, medical illiteracy and inability to access medical resources [21].

Also, the study indicates that the duration of the disease does not necessarily determine psychological outcomes. This means that in place of the real-life duration or severity scores, the subjective perception of the severity of the disease and its social impact by the patients may have a more significant impact on the mental health [18]. In general, these findings indicate that psychiatric comorbidity in psoriasis is a multifactorial phenomenon, where psychosocial stressors, visible disfigurement, and attitudes in society contribute significantly [22].

Its prevalence herein falls within moderate estimates as compared to previous studies that showed variable rates of anxiety and depression, highlighting the differences in patient groups and methods of evaluation [13]. Regardless of the physical pain, which psoriasis has caused, the application of HADS, which has given priority to the non-physical symptoms, would have provided a more precise measure of psychological load [23].

Limitations and Future Directions: This study has a number of limitations. First, the psoriasis and mental health outcomes have no causal relationships because it has a cross-sectional design. Second, the findings may not be fully applicable to the general population since only one tertiary care hospital was used in the study. Third, not all the potential confounding factors were properly considered, such as individual coping strategies, previous psychiatric history, and family support. Finally, self-reported questionnaires could have been used and thereby, response bias could have been introduced.

Future studies should adopt multicenter and longitudinal design so as to gain more insight on the time association between psychiatric comorbidities and severity of psoriasis. There is also need to carry out research on the interventions which enhance coping, enhance social support and enhance psychological strength. Also, the introduction of routine mental health testing into dermatology clinics can aid in detecting and treating anxiety and depression at an early stage and eventually support the quality of life of the patients.

Conclusion:

Anxiety and depression are common in patients with moderate to severe chronic plaque psoriasis, and this fact has a great impact on the overall well-being of the patient. Although the age, duration of illness and occupation showed no significant correlation with the psychological distress, gender, socioeconomic status, and education were found to be related. To enhance patient outcomes and quality of life, such findings highlight the importance of a holistic approach to psoriasis management, which involves physical therapy and mental health screening and interventions.

References:

1. Raharja A, Mahil SK, Barker JN. Psoriasis: a brief overview. Clinical Medicine. 2021 May 1;21(3):170-3.

2. Mathur A, Neema S, Sahu R, Radhakrishnan S. Anxiety, depression and harmful use of alcohol in severe chronic plaque psoriasis: A cross-sectional study. Medical Journal Armed Forces India. 2023 Jul 1;79(4):464-9.
3. Adamski Z, Kanabaj K, Kuźniak A. The link between psoriasis and other diseases based on epidemiological and genetic analyses. Advances in Dermatology and Allergology/PostępyDermatologiiiAlergologii. 2023 Aug 1;40(4):496-503.
4. Stoleriu G, Lupu A, Manolache N, Ciubara A, Branisteanu DE. Exploring the Neuropsychiatric Dimensions of Psoriasis: Pathophysiology, Clinical Implications, and Integrated Care Approaches. BRAIN. Broad Research in Artificial Intelligence and Neuroscience. 2024 Oct 12;15(3):223-35.
5. Pollo CF, Miot HA, Matos TD, de Souza JM, Jorge MF, Miot LD, Meneguin S. Prevalence and factors associated with depression and anxiety in patients with psoriasis. Journal of clinical nursing. 2021 Feb;30(3-4):572-80.
6. Talamonti M, Malara G, Natalini Y, Bardazzi F, Conti A, Chiricozzi A, Mugheddu C, Gisondi P, Piaserico S, Pagnanelli G, Amerio P. Secukinumab improves patient perception of anxiety and depression in patients with moderate to severe psoriasis: a post hoc analysis of the SUPREME study. ActaDermato-Venereologica. 2021 Mar 31;101(3):973.
7. Bakar RS, Jaapar SZ, Azmi AF, Aun YC. Depression and anxiety among patients with psoriasis: A correlation with quality of life and associated factors. Journal of Taibah University Medical Sciences. 2021 Aug 1;16(4):491-6.
8. Purzycka-Bohdan D, Kisielnicka A, Zabłotna M, Nedoszytko B, Nowicki RJ, Reich A, Samotij D, Szczęch J, Krasowska D, Bartosińska J, Narbutt J. Chronic plaque psoriasis in Poland: disease severity, prevalence of comorbidities, and quality of life. Journal of clinical medicine. 2022 Feb 25;11(5):1254.
9. Timis TL, Beni L, Mocan T, Florian IA, Orasan RI. Biologic therapies decrease disease severity and improve depression and anxiety symptoms in psoriasis patients. Life. 2023 May 19;13(5):1219.
10. Jing D, Xiao H, Shen M, Chen X, Han X, Kuang Y, Zhu W, Xiao Y. Association of psoriasis with anxiety and depression: a case–control study in Chinese patients. Frontiers in Medicine. 2021 Dec 24;8:771645.
11. Machado AK, Brito CV, de Souza Monteiro JA, Pires CA, Carneiro FR. Evaluation of Depression and Anxiety Disorders and Correlation with the Treatment of Patients with Psoriasis Vulgaris. Journal of the Portuguese Society of Dermatology and Venereology. 2020 Dec 19;78(4):321-7.
12. Bellinato F, Gisondi P, Fassio A, Girolomoni G. Central pain sensitization in patients with chronic plaque psoriasis. Dermatology and Therapy. 2023 May;13(5):1149-56.
13. Hedemann TL, Liu X, Kang CN, Husain MI. Associations between psoriasis and mental illness: an update for clinicians. General Hospital Psychiatry. 2022 Mar 1;75:30-7.
14. Grover S, Mehra A, Dogra S, Hazari N, Malhora N, Narang T, Sahoo S, Sharma S, Handa S, Avasthi A. Stigma experienced by the caregivers of patients with chronic plaque psoriasis. Indian Dermatology Online Journal. 2021 Jan 1;12(1):110-5.
15. Tian Z, Huang Y, Yue T, Zhou J, Tao L, Han L, Yan K, Huang Q, Zhang Z, Shao C. A Chinese cross-sectional study on depression and anxiety symptoms in patients with psoriasis vulgaris. Psychology, health & medicine. 2019 Mar 16;24(3):269-80.
16. Lukmanji A, Basmadjian RB, Vallerand IA, Patten SB, Tang KL. Risk of depression in patients with psoriatic disease: a systematic review and meta-analysis. Journal of Cutaneous Medicine and Surgery. 2021 May;25(3):257-70.
17. TzurBitan D, Krieger I, Comaneshter D, Cohen AD, Feingold D. The association between the socioeconomic status and anxiety–depression comorbidity in patients with psoriasis: a nationwide population-based study. Journal of the European Academy of Dermatology and Venereology. 2019 Aug;33(8):1555-61.
18. Dai M, Jiang Y, Xi Y, Xu L, Huang D, Wang Y, Hu Y, Yu Q, Shi Y. Evaluating the Role of Disease Duration in Systemic Therapy Response Among Patients with Moderate-to-Severe Psoriasis. Psoriasis: Targets and Therapy. 2025 Dec 31:513-25.
19. Lei D, Gong C, Wang B, Zhang L, Zhang G, Man MQ. The role of psychological stress in the pathogenesis of psoriasis. Frontiers in Medicine. 2025 Aug 11;12:1614863.
20. Acoba EF. Social support and mental health: the mediating role of perceived stress. Frontiers in psychology. 2024 Feb 21;15:1330720.
21. Siteneski A, Montes-Escobar K, de la Hoz-M J, Lapo-Talledo GJ, Gutiérrez Moreno G, Carlin Chavez E, Caicedo Quiroz R, Borja-Cabrera GP. Depression and Anxiety in Patients with Psoriasis: A Comprehensive Analysis Combining Bibliometrics, Latent Dirichlet Allocation, and HJ-Biplot. InHealthcare 2025 Feb 20 (Vol. 13, No. 5, p. 441). MDPI.
22. Luna PC, Chu CY, Fatani M, Borlenghi C, Adora A, Llamado LQ, Wee J. Psychosocial burden of psoriasis: a systematic literature review of depression among patients with psoriasis. Dermatology and therapy. 2023 Dec;13(12):3043-55.
23. Blackstone B, Patel R, Bewley A. Assessing and improving psychological well-being in psoriasis: considerations for the clinician. Psoriasis: Targets and Therapy. 2022 Mar 25:25-33.