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# Correlation of Psoriasis Severity with Depression, Anxiety, Stress, and Dermatology- Related Quality of Life among Patients with Plaque Psoriasis in Bangladesh

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# Abstract

Psoriasis is a chronic immune-mediated inflammatory skin disease that is frequently associated with psychological comorbidities and impaired quality of life. However, data evaluating the combined burden of depression, anxiety, stress, and dermatology-specific quality of life among patients with plaque psoriasis in Bangladesh remain limited. This study was conducted to assess depression, anxiety, stress, and dermatology-related quality of life among patients with plaque psoriasis and to evaluate their relationship with disease severity.

This cross-sectional study was conducted among 113 adult patients with plaque psoriasis attending Psoriasis Awareness Club and psoriasis clinics in Bangladesh between October 2024 to March 2025. Consecutive sampling was employed. Disease severity was assessed using the Psoriasis Area and Severity Index (PASI), psychological status was evaluated using the Bangla version of the Depression Anxiety Stress Scale-21 (DASS-21), and quality of life was measured using the Dermatology Life Quality Index (DLQI). Descriptive statistics, Chi-square test, and Pearson correlation analysis were performed using SPSS version 17. A p-value < 0.05 was considered statistically significant.

The mean age of participants was 36.12 ± 16.65 years, and 52.2% were male. The mean PASI score was 9.67 ± 6.37, with 34.5%, 34.5%, and 31.0% of patients classified as having mild, moderate, and severe psoriasis, respectively. Symptoms of depression, anxiety, and stress were present in 65.5%, 80.5%, and 70.8% of participants, respectively. The mean DLQI score was 14.46 ± 6.42, with 71.7% of patients reporting a very large or extremely large impact on quality of life. PASI severity was significantly associated with stress ($p = 0.031$), whereas no significant associations were observed with anxiety or depression. PASI demonstrated significant positive correlations with stress ($r = 0.436$), anxiety ($r = 0.323$), depression ($r = 0.354$), and DLQI ($r = 0.303$) (all $p \leq 0.001$). DLQI was strongly correlated with stress ($r = 0.757$), anxiety ($r = 0.754$), and depression ($r = 0.798$) (all $p < 0.001$).

Plaque psoriasis is associated with a considerable psychological burden and substantial impairment in dermatology-specific quality of life. Routine psychological evaluation together with quality-of-life assessment should be incorporated into comprehensive psoriasis management.


# Introduction

Psoriasis is a chronic, immune-mediated inflammatory skin disease that affects approximately 2–3% of the global population [1]. The condition affects both men and women, with earlier onset in females and those with a family history. The age at onset demonstrates a bimodal distribution, with peak incidence at 30–39 and 60–69 years in men and approximately a decade earlier in women. The prevalence is higher in high-income regions, particularly Western/Central Europe and North America [2]. The disease encompasses several clinical subtypes, of which plaque psoriasis is the most common. In addition to its characteristic cutaneous manifestations, psoriasis is increasingly recognized as a systemic disease associated with multiple comorbidities, including psoriatic arthritis, hepatic disease, metabolic and cardiovascular disorders, and psychological illnesses [1, 3]. Persistent systemic inflammation mediated

through the IL-23/Th17 pathway is believed to contribute to many of these extra-cutaneous manifestations, emphasizing that psoriasis extends far beyond the skin [3, 4].

Subsequently, a considerable psychosocial burden is posed by the condition owing to its chronic, visible, and often stigmatizing nature, frequently affecting patients' daily functioning and social well-being. The World Health Organization has highlighted the significant social stigma and psychological distress experienced by individuals with psoriasis [5]. Consistent with this, large population-based studies have demonstrated that patients with psoriasis are at significantly increased risk of depression, anxiety, and suicidal behavior compared with the general population, particularly those with the severe form of the disease [6]. Beyond psychiatric morbidity, these psychological disturbances adversely affect treatment adherence, interpersonal relationships, work productivity, and overall health-related quality of life (QoL), thereby substantially increasing the burden of disease [7, 8].

The severity of psoriasis is commonly evaluated using the Psoriasis Area and Severity Index (PASI), whereas the Dermatology Life Quality Index (DLQI) is a validated, subjective outcome measure that assesses the impact of skin disease on health-related QoL [9]. Together with standardized psychological assessment tools such as the Depression Anxiety Stress Scale-21 (DASS-21), these instruments provide a comprehensive evaluation of the clinical, psychological, and functional burden of psoriasis [10]. Recent international guidelines recommend integrating physician-assessed disease severity with patient-reported outcome measures, including QoL and psychological assessment, to facilitate comprehensive management and individualized treatment decisions [11].

Despite growing recognition of the psychological burden associated with psoriasis, data evaluating depression, anxiety, stress, and dermatology-specific QoL among patients with plaque psoriasis in Bangladesh remain limited. Therefore, the present study aimed to assess depression, anxiety, and stress using the DASS-21, evaluate dermatology-related QoL using the DLQI, and examine their relationship with disease severity measured by the PASI among patients with plaque psoriasis attending specialized psoriasis clinics in Bangladesh.

## Methods

# Study design and setting

This cross-sectional analytical study was conducted among patients with plaque psoriasis attending the Psoriasis Awareness Club and dedicated psoriasis clinics in Bangladesh between October 2024 to March 2025. The study aimed to evaluate the prevalence and severity of depression, anxiety, and stress, assess dermatology-specific QoL, and determine their associations with psoriasis severity.

## Study participants

Consecutive patients aged ≥ 16 years with clinically diagnosed plaque psoriasis attending the participating clinics during the study period were invited to participate. Patients with dermatological conditions mimicking plaque psoriasis or those unwilling to provide written informed consent were excluded. A total of 113 eligible patients were consecutively enrolled during the study period.

## Data collection

Sociodemographic and clinical information including age, sex, body mass index (BMI), occupation and smoking status were collected using a structured, pretested questionnaire. Clinical examination was performed by consultant dermatologists, and psoriasis severity was assessed using the Psoriasis Area and Severity Index (PASI). Participants subsequently completed the validated Bangla versions of the Depression Anxiety Stress Scale-21 (DASS-21) and the Dermatology Life Quality Index (DLQI), which were scored according to their respective standard guidelines. All questionnaires were completed during the same study visit to ensure consistency between clinical assessment and patient-reported outcomes.

## Variables

The primary outcome variables were depression, anxiety, stress and dermatology-related quality of life. Disease severity was assessed using PASI and categorized as mild (< 7), moderate (7–12) and severe (> 12). DLQI scores were classified as no effect (0–1), small effect (2–5), moderate effect (6–10), very large effect (11–20) and extremely large effect (21–30). Depression, anxiety and stress were categorized according to standard DASS-21 severity classifications. Age, sex, BMI, occupation, and smoking status were considered baseline descriptive variables.

# Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25.0 (IBM Corp., Armonk, NY, USA). Continuous variables are presented as mean ± standard deviation (SD) or median where appropriate, while categorical variables are expressed as frequencies and percentages. Associations between PASI severity, DLQI categories and DASS severity categories were evaluated using Pearson's chi-square test. Pearson's correlation coefficient was used to determine correlations between PASI, DLQI and DASS domain scores. All statistical tests were two-tailed, and a p-value < 0.05 was considered statistically significant.

# Ethical consideration

**Ethical approval**

(no. PMC/IEthicalrb/2024/047) was obtained from the Institutional Review Board of Popular Medical College and Hospital, Dhaka, Bangladesh prior to commencement of the study. Written informed consent

was obtained from all participants before enrolment. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

## Use of Artificial Intelligence

During preparation of this manuscript, the authors used ChatGPT (OpenAI) for language refinement and presentation of the scientific content. The authors reviewed and verified all AI-assisted content and take full responsibility for the accuracy, integrity, and final version of the manuscript. No artificial intelligence tools were used for data collection, statistical analysis, or interpretation of the study results.

## Result

The mean age was 36.12 ± 16.65 years. Males accounted for 59 (52.2%) of the cohort and females for 54 (47.8%). Regarding body mass index, 6 (5.3%) were underweight, 32 (28.3%) had normal weight, 33 (29.2%) were overweight and 42 (37.2%) were obese. More than half of participants were unemployed (60, 53.1%). The majority were non-smokers (88, 77.9%); current smokers numbered 17 (15.0%). [Table 1]

Table 1
Baseline characteristics of the participants (n = 113)

| Characteristics | Value |
|---|---|
| **Age (in years)** | 36.12 ± 16.647 |
| **Gender** | |
| Male | 59 (52.2) |
| Female | 54 (47.8) |
| **Body mass index** | |
| Underweight | 6 (5.3) |
| Normal weight | 32 (28.3) |
| Overweight | 33 (29.2) |
| Obese | 42 (37.2) |
| **Occupation** | |
| Unemployed | 60 (53.1) |
| Employed | 53 (46.9) |
| **Smoking status** | |
| Non-smoker | 88 (77.9) |
| Smoker | 17 (15.0) |
| Past smoker | 8 (7.1) |

The mean PASI score was 9.67 ± 6.37 (range 0.30–30.0) reflecting the presence of both very mild and highly severe plaque psoriasis within the cohort. When categorized by severity, 34.5% of patients had mild psoriasis, an equal proportion (34.5%) had moderate disease, while 31.0% exhibited severe psoriasis. [Table 2]

Table 2
Psoriasis Area and Severity Index (PASI) of the participants (n = 113)

| PASI parameter | Value |
|---|---|
| **Mean ± SD** | 9.67 ± 6.37 |
| **Range (min-max)** | 0.30–30.0 |
| **PASI severity categories (n/%)** | |
| Mild (< 7) | 39 (34.5) |
| Moderate (7–12) | 39 (34.5) |
| Severe (> 12) | 35 (31.0) |

A high prevalence of psychological distress among patients with plaque psoriasis was evident. Overall, 65.5%, 80.5%, and 70.8% of participants exhibited varying degrees of depression, anxiety, and stress, respectively. Anxiety was the most prominent psychological disturbance, with 46.0% reporting severe or extremely severe anxiety [Table 3]

Table 3
Depression Anxiety Stress Scale (DASS) of the participants (n = 113)

| Domains of DASS | Normal (n/%) | Mild (n/%) | Moderate (n/%) | Severe (n/%) | Extremely severe (n/%) |
|---|---|---|---|---|---|
| **Depression** | 39 (34.5) | 19 (16.8) | 27 (23.9) | 11 (9.7) | 17 (15.0) |
| **Anxiety** | 22 (19.5) | 27 (23.9) | 12 (10.6) | 26 (23.0) | 26 (23.0) |
| **Stress** | 33 (29.2) | 33 (29.2) | 26 (23.0) | 18 (15.9) | 3 (2.7) |

The mean DLQI score was 14.46 ± 6.42, with a median score of 14.0. When classified into severity categories, only 1.8% of participants reported no impact on QoL, and 8.8% reported a small effect. A larger proportion (17.7%) experienced a moderate effect, while the majority (54.9%) fell within the very large effect category. Notably, 16.8% of patients reported an extremely large effect on QoL, indicating significant psychosocial and functional impairment. [Table 4]

Table 4
Dermatology Life Quality Index (DLQI) Scores of the participants (n = 113)

| Parameter | Value |
|---|---|
| **Mean ± SD** | 14.46 ± 6.42 |
| **Median** | 14.0 |
| **Range (min-max)** | 0–27 |
| **DLQI categories, n (%)** | |
| No effect (0–1) | 2 (1.8) |
| Small effect (2–5) | 10 (8.8) |
| Moderate effect (6–10) | 20 (17.7) |
| Very large effect (11–20) | 62 (54.9) |
| Extremely large effect (21–30) | 19 (16.8) |

The association between PASI and psychological symptoms was assessed using the Chi-square test. For the stress domain, there was a statistically significant association with PASI severity ($\chi^2 = 364.64$, $p = 0.031$), indicating that higher psoriasis severity was linked to greater stress levels among patients. In contrast, no significant associations were found for anxiety ($\chi^2 = 429.15$, $p = 0.114$) or depression ($\chi^2 = 330.09$, $p = 0.281$). [Table 5]

Table 5
Association between PASI Severity and DASS Domains

| DASS domains | Pearson Chi-square ($\chi^2$) | p-value |
|---|---|---|
| Stress | 364.638 | 0.031 |
| Anxiety | 429.145 | 0.114 |
| Depression | 330.094 | 0.281 |

Analysis of DASS domains using Pearson's Chi-Square test revealed significant associations across all domains: Stress ($\chi^2 = 192.03$, $p < 0.001$), Anxiety ($\chi^2 = 188.73$, $p = 0.002$), and Depression ($\chi^2 = 205.63$, $p < 0.001$). [Table 6]

Table 6
Association between DLQI categories and DASS categories

| DASS domains | Pearson Chi-square ($\chi^2$) | p-value |
|---|---|---|
| Stress | 192.031 | < 0.001 |
| Anxiety | 188.726 | 0.002 |
| Depression | 205.629 | < 0.001 |

Pearson Correlation Analysis demonstrated that, PASI displays a moderate positive correlation with stress (r = 0.436, p < 0.001), anxiety (r = 0.323, p < 0.001), and depression (r = 0.354, p < 0.001), indicating that higher psoriasis severity was associated with greater psychological distress. In addition, PASI also demonstrates a significant but weaker correlation with DLQI (r = 0.303, p = 0.001), suggesting that disease severity contributed to impairment in quality of life. Furthermore, all DASS domains were strongly intercorrelated, with coefficients ranging from r = 0.814 to r = 0.851 (all p < 0.001). DLQI showed strong positive correlations with stress (r = 0.757), anxiety (r = 0.754), and depression (r = 0.798), all statistically significant (p < 0.001), indicating that psychological distress was closely linked to poorer dermatology-related quality of life. [Table 7]

Table 7
Pearson Correlation matrix between PASI, DASS Domains and DLQI (n = 113)

| Variables | PASI | Stress | Anxiety | Depression | DLQI |
|---|---|---|---|---|---|
| **PASI** | 1 | 0.436 (p < 0.001) | 0.323 (p < 0.001) | 0.354 (p < 0.001) | 0.303 (p = 0.001) |
| **Stress** | 0.436 (p < 0.001) | 1 | 0.821 (p < 0.001) | 0.851 (p < 0.001) | 0.757 (p < 0.001) |
| **Anxiety** | 0.323 (p < 0.001) | 0.821 (p < 0.001) | 1 | 0.814 (p < 0.001) | 0.754 (p < 0.001) |
| **Depression** | 0.354 (p < 0.001) | 0.851 | 0.814 (p < 0.001) | 1 | 0.798 (p < 0.001) |
| **DLQI** | 0.303 (p = 0.001) | 0.757 (p < 0.001) | 0.754 (p < 0.001) | 0.798 (p < 0.001) | 1 |

# Discussion

The present study included relatively young adults, with a mean age of 36.12 ± 16.65 years, which is comparable to the findings of Sultana et al., in a recent study conducted in Bangladesh who reported a mean age of 35.15 ± 13.63 years among patients with psoriasis [12]. This similarity likely reflects the tendency of psoriasis to affect individuals during the most economically productive years of life. In

terms of sex distribution, a slight male predominance was observed in the present study (52.2% vs. 47.8%), whereas Sultana et al. reported a female predominance with a male-to-female ratio of 1:1.2 [12]. In contrast, a large multicenter study from Shanghai involving 2,102 patients demonstrated a more pronounced male predominance (63.4%), with approximately 70% of patients aged over 35 years, findings that closely mirror the age distribution observed in our cohort [13]. Furthermore, obesity was common in our study, with 37.2% of participants classified as obese and 29.2% as overweight, which is consistent with the Shanghai study, where nearly half of the patients were either overweight or obese [13]. Similarly, the majority of our participants were non-smokers (77.9%), although 15.0% were current smokers, broadly comparable with the smoking prevalence reported in the Chinese cohort [13]. The minor variations in demographic characteristics across studies are likely attributable to differences in ethnicity, lifestyle, healthcare-seeking behavior, and geographic settings rather than inherent differences in the epidemiology of psoriasis [2].

In the present study, the mean PASI score was 9.67 ± 6.37, with 34.5% of patients classified as having mild psoriasis, 34.5% as moderate psoriasis, and 31.0% as severe psoriasis. These findings are broadly comparable to those reported by Chowdhury, MI., from Dhaka, where mild psoriasis was the most common disease category (41.3%), followed by moderate (36.3%) and severe psoriasis (22.5%) [13]. Similarly, another Bangladeshi study by Sultana et al. reported that 56.3% of patients had mild psoriasis (PASI ≤ 10), while 43.8% had moderate-to-severe disease (PASI > 10) [12]. Although the proportion of severe psoriasis was somewhat higher in our cohort, all three studies indicate that mild-to-moderate psoriasis constitutes the predominant clinical presentation among Bangladeshi patients. The relatively greater proportion of severe cases in our study may be attributable to differences in referral patterns, patient selection, and the specialized psoriasis clinics from which participants were recruited.

In addition, the present study demonstrated a high prevalence of psychological morbidity among patients with plaque psoriasis. Overall, 65.5% of participants exhibited varying degrees of depressive symptoms, while 80.5% had anxiety symptoms and 70.8% reported stress. These findings are also supported by a recent systematic review demonstrating that individuals with psoriasis have significantly higher rates of depression and anxiety than the general population [14] In contrast, a recent cross-sectional study from Southern India by Manohar et al., using the same DASS-21 instrument reported substantially lower prevalence of depression (22.2%) and anxiety (9.5%), with no participants experiencing clinically significant stress [10] The markedly higher burden of psychological symptoms observed in our study may be due to differences in disease characteristics, patient populations, sociocultural influences, and the availability of mental health support services.

Furthermore, the impact of psoriasis on dermatology-specific quality of life was considerable in the present study. The mean DLQI score was 14.46 ± 6.42, with more than half of the participants (54.9%) experiencing a very large effect on QoL and a further 16.8% reporting an extremely large effect. Similar findings were reported by Chowdhury, MI. et al., in which most patients experienced moderate-to-extremely large impairment in QoL, with 26.3% and 12.5% falling into the very large and extremely large effect categories, respectively [15]. On the contrary, a large international multicenter study by Julia-

Tatjana et al., involving 1,158 patients from Switzerland, Latin America, Asia, and the United States reported a lower median DLQI score of 8 (IQR 4–15) [9]. The relatively greater impairment observed in our cohort may reflect variations in disease severity, cultural views and mental health support.

Besides, in the present study, PASI severity demonstrated a statistically significant association with stress, whereas no significant associations were observed with anxiety or depression. These findings suggest that increasing clinical severity of psoriasis may be more closely related to perceived stress than to depressive or anxiety symptoms when analyzed using categorical severity groups. Similar observations were found in the South Indian study using DASS-21 which reported a weak relationship between PASI and psychological outcomes, while QoL exhibited a stronger association with depression, anxiety, and stress [10].

Moreover, the significant association observed between DLQI impairment and psychological distress across all three DASS domains (stress, anxiety, and depression) in our study highlights the bidirectional burden of plaque psoriasis on skin and mental health. This finding is consistent with regional studies. For instance, Ahmad Fuat et al., in Malaysia demonstrated that higher DLQI impairment was strongly associated with increased risk and severity of psychological distress and depression ($p < 0.001$) [16]. These findings emphasize that psychological morbidity directly scales with perceived QoL impairment caused by visible cutaneous lesions.

Finally, correlation analysis in the present study demonstrated that increasing psoriasis severity was significantly associated with greater psychological distress and poorer QoL. PASI displayed moderate positive correlations with stress ($r = 0.436$), anxiety ($r = 0.323$), depression ($r = 0.354$), and DLQI ($r = 0.303$), indicating that worsening disease severity was accompanied by increased psychological burden and impaired dermatology-specific QoL. Furthermore, strong positive correlations were observed between DLQI and all three DASS domains ($r = 0.754–0.798$), while the DASS domains themselves were also highly intercorrelated ($r = 0.814–0.851$), emphasizing the close relationship between emotional distress and QoL impairment. These findings are consistent with those of the recent South Indian study by Manohar et al., which also demonstrated a weak-to-moderate correlation between PASI and DLQI ($\rho = 0.352$) and significant positive correlations between DLQI and depression ($\rho = 0.571$), anxiety ($\rho = 0.540$), and stress ($\rho = 0.553$) [10]. Similarly, the multinational study by Julia-Tatjana et al., demonstrated a significant positive correlation between PASI and DLQI, confirming that increasing disease severity is associated with progressively impaired dermatology-related QoL [9]. Moreover, systematic evidences indicate that psychological distress is a major determinant of QoL in psoriasis and often explains patient-perceived disease burden beyond objective clinical severity [14, 17] Collectively, these findings reinforce that patient-reported QoL reflects not only the clinical severity of psoriasis but also its substantial psychological impact, shedding light on the significance of incorporating both DLQI and standardized psychological assessment into routine clinical care.

The strong association between psychological distress and impaired QoL observed in the present study may be explained by the complex bidirectional relationship between psoriasis and mental health [18]

Beyond the psychosocial effects of living with a chronic, visible skin disease, accumulating evidence suggests that psoriasis and depression share common inflammatory and neuroimmune pathways involving cytokines such as tumor necrosis factor-α (TNF-α), interleukin (IL)-6, and the IL-17/IL-23 axis [19]. Moreover, previous studies have demonstrated that stress and depressive symptoms are associated with increased psoriasis flare-ups and greater pruritus severity [20]. Furthermore, chronic stress and depression may themselves exacerbate psoriasis through dysregulation of immune and neuroendocrine responses, creating a self-perpetuating cycle of worsening skin disease and psychological morbidity [21]. In addition, factors such as vitamin D deficiency may contribute to the pathogenesis of both conditions [22]. Consequently, the psychological burden experienced by patients with psoriasis is likely to reflect not only cosmetic or social concerns but also shared biological mechanisms underlying both conditions. These findings further support the integration of psychological assessment and multidisciplinary care into the routine management of patients with psoriasis.

# Strengths and limitations

This study provides one of the few comprehensive evaluations of the psychological burden and dermatology-specific QoL among patients with plaque psoriasis in Bangladesh using validated instruments, such as the PASI, DASS-21, and DLQI. The simultaneous assessment of clinical severity, psychological morbidity, and QoL enabled a comprehensive evaluation of the multidimensional impact of psoriasis.

However, several limitations should be acknowledged. The cross-sectional design precludes causal inference between psoriasis severity, psychological distress, and quality of life. Participants were recruited from specialized psoriasis clinics using consecutive sampling, which may limit the generalizability of the findings to the broader psoriasis population. In addition, psychological outcomes were assessed using self-administered questionnaires rather than formal psychiatric interviews, introducing the possibility of reporting bias.

# Conclusion

Patients with plaque psoriasis in Bangladesh experience a substantial psychological burden and marked impairment in dermatology-related QoL. While disease severity exhibited modest associations with psychological distress, QoL was more strongly related to depression, anxiety, and stress. Our findings highlight the importance of incorporating routine psychological screening and QoL assessment into the comprehensive management of psoriasis to facilitate early identification of vulnerable patients and optimize multidisciplinary care.

# Declarations

**Author contributions**

T.N. conceptualized the study, contributed to study design, participant recruitment, clinical assessment, and manuscript preparation. S.J. contributed to clinical assessment, data collection, and interpretation of the findings. A.J. contributed to data collection, clinical assessment, and manuscript review. A.G. contributed to data collection, clinical assessment, and manuscript review. T.M. contributed to data curation, statistical analysis, interpretation of the results, and manuscript drafting and revision. F.H. contributed to study supervision, clinical interpretation, and critical revision of the manuscript. All authors reviewed and approved the final manuscript and agreed to be accountable for all aspects of the work.

**Data availability statement**

The datasets analysed during the current study are not publicly available due to restrictions relating to participant privacy and confidentiality but are available from the corresponding author on reasonable request, subject to appropriate ethical and institutional approval.

**Competing interests**

The authors declare no competing interests.

**Sponsorship and/or funding**

Not applicable.

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