A Cross-sectional Study of Prevalence and Implications of Depression and Anxiety in Psoriasis

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ABSTRACT

Background: Physical and mental comorbidity is common and has significant implications for overall health outcomes. Psoriasis, a psychocutaneous disorder, is a classic example of mental-physical comorbidity. Aims: In view of the impact of socio-cultural influences on mind-body interactions and the paucity of Indian research pertaining to psychiatric morbidity in psoriatic patients, this study was undertaken to measure the prevalence of anxiety and depression in patients with psoriasis, and to correlate these with severity of psoriasis and quality of life. Materials and Methods: This cross-sectional study was conducted on 90 consecutive patients of psoriasis, over a period of 12 months, in a tertiary care centre. The Psoriasis Area and Severity Index was used to assess severity of psoriasis. PHQ-9, GAD-7 and the Perceived Stress Scale were used to screen for depression, anxiety and perceived stress respectively. The WHOQOL-BREF was used to determine the quality of life. Statistics Analysis: All analysis was performed using Microsoft Excel software and Statistical Package for Social Sciences. Results: A total of 71 (78.9%) subjects had depression and 69 (76.7%) had anxiety. Fifty one patients had significant stress. A significant positive correlation was established between psoriasis variables (severity and duration of psoriasis) and psychological variables (depression, anxiety and stress). Severity of psoriasis had a significant negative correlation with social relationships and environmental domains of WHOQOL. Quality of life was significantly worse in patients with psoriasis with comorbid anxiety/depression. Conclusion: Patients with psoriasis have a clinically significant prevalence of depression, anxiety and perceived stress. This study highlights the complex relationship between psoriasis, psychiatric comorbidity and quality of life and the need to simultaneously consider dermatological and psychological factors.

Key words: Anxiety, depression, psoriasis, psychodermatology

INTRODUCTION

Mental and neurological disorders account for 10% of total Disability Adjusted Life Years lost due to all causes in the World Health Organisation's Disability Adjusted Life Years database. This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

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diseases.\(^1\) Research evidence consistently demonstrates that the risk of experiencing mental health problems is higher in people with recurrent, or progressive medical conditions.\(^2\)

Psoriasis is a psychocutaneous disease of the skin affecting approximately 1.4-2% of the world’s population, with men and women being affected equally.\(^3\) Many studies done worldwide have shown that psychiatric comorbidities are frequently found among patients with psoriasis.\(^4-8\) In view of the paucity of Indian research pertaining to the psychological aspects of psoriasis; it is necessary for further research to be conducted specifically in our cultural milieu.

This study aimed to measure the prevalence of anxiety and depression and levels of perceived stress in patients with psoriasis attending a Tertiary Care Hospital in Puducherry, India. An attempt was also made to study the correlations between psychological variables (depression, anxiety, and perceived stress), severity of psoriasis and quality of life.

**MATERIALS AND METHODS**

The study was an observational cross-sectional study, conducted by the Departments of Psychiatry and Dermatology, Mahatma Gandhi Medical College and Research Institute, a Tertiary Care Hospital in Puducherry, over 1-year period. The study was approved by the Institutional Ethical Committee.

All consecutive patients aged 18-64 years, registering in the Department of Dermatology, and diagnosed to have psoriasis, were taken up for the study. Patients with comorbid skin disorders and prediagnosed chronic medical conditions were excluded from the study. The Psoriasis Area and Severity Index (PASI)\(^9\) was completed by the consultant dermatologist, to rate the severity of psoriasis. Through a brief clinical interview, patients with features suggestive of psychosis, cognitive impairment, substance-related disorders and history of previously diagnosed mental disorder were excluded from the study and were taken up by the Department of Psychiatry for further assessment.

Those patients who were eligible for inclusion into the study were provided the salient details of the research project, and informed consent was obtained. A total of 120 patients were screened. Ninety patients fulfilling the inclusion criteria were enrolled into the study. A structured proforma was used to record information regarding the sociodemographic and clinical profiles.

All subjects were screened for depression, anxiety, perceived stress, and quality of life using the PHQ-9\(^10\), GAD-7\(^11\), perceived stress scale (PSS)\(^12\) and WHOQOL-BREF\(^13\) respectively. Subjects who received positive scores on any of the mental health screening instruments were taken up by the Department of Psychiatry for further management. Appropriate psychiatric treatment was then added to the treatment regimen prescribed by the Department of Dermatology.

All analysis was performed using Microsoft Excel software and Statistical Package for Social Sciences (SPSS for Windows, Version 16.0. Chicago, SPSS Inc.).

**RESULTS**

The mean age of the study sample was 41.91 years. The majority of subjects were aged 31-40 years. Of the 90 patients, 69 (76.7%) patients belonged to the lower middle socioeconomic status and 60 (66.7%) were from rural areas. The majority were males (56.7%) and were married (87.8%) [Table 1]. The most frequently diagnosed type of psoriasis was psoriasis vulgaris (75.6%) [Table 2].

Of a total of 90 patients with psoriasis, 71 patients had significant depression, which implies a prevalence of 78.9%. Sixty-nine patients scored positive for anxiety, yielding a prevalence of 76.7%. Fifty-one patients were considered to have significant stress. Twenty patients were found to have a score ≥20, indicating severe degrees of perceived stress.

Twenty-four patients (16.6%) reported that their quality of life was “poor” to “very poor” and 35 (35.6%) patients reported “neither poor nor good.” To the question “How satisfied are you with your health?”

| **Table 1: Distribution of sociodemographic variables in patients with psoriasis (N = 90)** |
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| **Variables** | **Categories** | **No of patients n (%)** |
| **Age in years** | 20 and below | 7 (7.8%) |
| | 21-30 | 7 (7.8%) |
| | 31-40 | 25 (27.8%) |
| | 41-50 | 24 (26.7%) |
| | 51-60 | 24 (26.7%) |
| | Above 60 | 3 (3.3%) |
| **Gender** | Male | 51 (56.7%) |
| | Female | 39 (43.3%) |
| **Marital status** | Single | 11 (12.2%) |
| | Married | 79 (87.8%) |
| **Area of domicile** | Rural | 60 (66.7%) |
| | Urban | 30 (33.3%) |
| **Socio-economic class** | Upper | 0(0%) |
| | Upper middle | 7 (7.8%) |
| | Lower middle | 69 (76.7%) |
| | Upper lower | 12 (13.3%) |
| | Lower | 2 (2.2%) |
26 (28.9) patients reported “poor” to “very poor” and 33 (36.7%) reported “neither poor nor good.”

**Association of sociodemographic variables with psychiatric morbidity, clinical variables of psoriasis and quality of life**

The rates of depression were significantly higher if the patient with psoriasis was from a rural area. The odds of depression were 3.28 times higher for rural patients. However, an area of domicile (AD) explained only 5.6% to 8.6% variance in the depression score. As age increased, the PSS score also increases by a small amount. However, age is not a strong predictor as it explained only 5% of the variance in PSS. Anxiety, severity of psoriasis and quality of life were not predicted by any sociodemographic variable.

**Severity of psoriasis and psychiatric morbidity**

Total PASI score (severity of psoriasis) had a significant positive correlation with total depression score ($r = 0.465$, $P = 0.000$), anxiety score ($r = 0.515$, $P = 0.000$) and perceived stress score ($r = 0.544$, $P = 0.000$) [Table 3]. Patients of psoriasis with anxiety and depression had a significantly higher score on PASI in contrast to patients without anxiety and depression. The predictive relationship between severity of psoriasis (PASI) and absolute scores of depression (PHQ-9), anxiety (GAD), and PSS was statistically significant [Table 4]. Severity of psoriasis and depression could predict approximately 22% of the variance in each other. Severity of psoriasis and anxiety could predict approximately 27% of variance in each other. The predictive relationship between severity of psoriasis and stress was the highest (30% variance prediction). There was a higher cumulative probability for patients with higher PASI scores to have a more severe grade of depression/anxiety.

**Duration of psoriasis and psychiatric morbidity**

There was a positive correlation between the total duration of psoriasis and the total depression score ($r = 0.382$, $P = 0.000$), anxiety score ($r = 0.309$, $P = 0.000$) and perceived stress score ($r = 0.305$, $P = 0.000$) [Table 3]. The predictive relationship between the duration of psoriasis and the absolute scores of depression (PHQ-9), anxiety (GAD) and PSS was statistically significant [Table 5]. There was a higher cumulative probability for patients with longer duration of psoriasis to have a severe grade of depression/anxiety.

**Table 2: Prevalence of the different types of psoriasis according to ICD-10 categories in patients with psoriasis (N = 90)**

| ICD-10 code | Type of psoriasis       | No of patients n (%) |
|-------------|-------------------------|----------------------|
| L40.0       | Psoriasis vulgaris      | 68 (75.6%)           |
| L40.1       | Generalized pustular psoriasis | 0 (0%)               |
| L40.2       | Acrodermatitis continua | 0 (0%)               |
| L40.3       | Pustulosis palmaris et plantaris | 0 (0%)             |
| L40.4       | Guttate psoriasis       | 0 (0%)               |
| L40.5       | Arthropathic psoriasis  | 0 (0%)               |
| L40.50      | Unspecified             | 0 (0%)               |
| L40.51      | Distal interphalangeal psoriatic arthropathy | 0 (0%)          |
| L40.52      | Psoriatic arthritis mutilans | 0 (0%)             |
| L40.53      | Psoriatic spondylitis   | 0 (0%)               |
| L40.54      | Psoriatic juvenile arthropathy | 0 (0%)       |
| L40.59      | Other psoriatic arthropathy | 1 (1.1%)         |
| L40.8       | Scalp psoriasis         | 5 (5.6%)             |
|             | Palmoplantar psoriasis  | 15 (16.7%)           |
|             | Nail psoriasis          | 1 (1.1%)             |
| L40.9       | Psoriasis unspecified   | 0 (0%)               |

**Table 3: Correlation between psychiatric morbidity, clinical variables of psoriasis and quality of life**

|                            | PHQ9 total score | GAD7 total score | PSS | PASI | Psoriasis Duration |
|---------------------------|------------------|------------------|-----|------|---------------------|
| PHQ9 total score          | r                | .919**           | .854** | .465** | .382**               |
| p                         | .000             | .000             | .000 | .000 |                      |
| GAD7 total score          | r .919**         | .872**           | .515** | .309** |                      |
| p .000                    | .000             | .000             | .000 | .003 |                      |
| PSS                       | r .854**         | .872**           | .544** | .305** | .198                |
| p .000                    | .000             | .000             | .000 | .003 | .061                |
| PASI                      | r .465**         | .515**           | .544** | —     | .198                |
| p .000                    | .000             | .000             | .000 | .061 |                      |
| Psoriasis Duration        | r .382**         | .309**           | .305** | .198 | —                   |
| p .000                    | .003             | .003             | .061 | .167 |                      |
| WHOQOL physical domain    | r -.031          | .045             | .249*  | .145 | -.167               |
| p .774                    | .677             | .018             | .173 | .116 |                      |
| WHOQOL psychological domain | r .019           | .032             | .212*  | .018 | -.162               |
| p .858                    | .762             | .044             | .868 | .127 |                      |
| WHOQOL social domain      | r -.285**        | -.208*           | -.084  | .032 | -.223*              |
| p .06                        | .049             | .433             | .764 | .035 |                      |
| WHOQOL environmental domain | r -.355**       | -.269*           | -.152  | -.067 | -.142               |
| p .001                     | .010             | .153             | .530 | .183 |                      |
Association of quality of life with severity of psoriasis and psychiatric morbidity
The severity of psoriasis had a significant negative correlation with two domains of WHOQOL: Social relationships ($r = -0.285, P = 0.006$) and environmental domain ($r = -0.208, P = 0.049$) [Table 3]. The proportion of patients reporting their quality of life as poor to very poor was significantly higher in patients of psoriasis with anxiety and depression [Table 6]. Similarly, a significantly higher proportion of patients of psoriasis with anxiety and depression reported their satisfaction with health as poor to very poor.

DISCUSSION
This study analyzed the prevalence and implications of psychiatric morbidity among patients with psoriasis attending a Tertiary Care Center. We also studied the influence of sociodemographic and

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Table 4: Regression analysis of the predictive relationship between psychological variables and severity of psoriasis (PASI)

| Variables                  | Model | Unstandardized Coefficients | Standardized Coefficients | t    | p    |
|----------------------------|-------|----------------------------|---------------------------|------|------|
|                           |       | B              | Std. Error | Beta |      |      |
| Depression(PHQ9) and severity of psoriasis(PASI) | 1 (Constant) | 8.116 | .869 | .465 | 9.339 | .000 |
|                           |       | Dependent Variable: PHQ9 |                         |      |      |
|                           |       | PASI           | 3.65        | .074 | 4.925 | .000*|
|                           |       | Predictor Variable: PHQ9 |                       |      |      |
|                           |       | PASI           | 1.915       | 1.549| 1.237 | .219 |
|                           |       | Dependent Variable: PASI |                      |      |      |
|                           |       | PHQ9           | .592        | .120 | 4.925 | .000*|
| Anxiety(GAD7) and severity of psoriasis(PASI)    | 1 (Constant) | 6.727 | .845 | .515 | 7.962 | .000 |
|                           |       | Dependent Variable: GAD7 |                  |      |      |
|                           |       | PASI           | .406        | .072 | 5.641 | .000*|
|                           |       | Predictor Variable: GAD7 |                   |      |      |
|                           |       | PASI           | 1.901       | 1.391| 1.367 | .175 |
|                           |       | Dependent Variable: GAD7 |                  |      |      |
|                           |       | GAD7           | .653        | .116 | 5.641 | .000*|
| Perceived stress(PSS) and severity of psoriasis(PASI) | 1 (Constant) | 10.961 | .844 | .544 | 12.986 | .000 |
|                           |       | Dependent Variable: PSS |                    |      |      |
|                           |       | PSS            | .437        | .072 | 6.078 | .000*|
|                           |       | Predictor Variable: PSS |                    |      |      |
|                           |       | PSS            | -1.371      | 1.786| -.767 | .445 |
|                           |       | Dependent Variable: PSS |                   |      |      |

$p < 0.05 = $ statistical significance

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Table 5: Regression analysis of predictive relationship between depression/anxiety/stress and duration of psoriasis

| Model | Unstandardized Coefficients | Standardized Coefficients | t    | p    |
|-------|------------------------------|---------------------------|------|------|
|       | B              | Std. Error | Beta |      |      |
| 1 (Constant) | 7.555 | 1.135 | .6659 | .000 |
| PSORIASIS DURATION | .570 | .147 | .382 | 3.880 | .000*|
| Dependent Variable: PHQ9 (DEPRESSION) |       |       |       |      |
|       | Unstandardized Coefficients | Standardized Coefficients | t    | p    |
|       | B              | Std. Error | Beta |      |      |
| 1 (Constant) | 7.215 | 1.173 | 6.151 | .000 |
| PSORIASIS DURATION | .463 | .152 | .309 | 3.047 | .003*|
| Dependent Variable: GAD7 (ANXIETY) |       |       |       |      |
|       | Unstandardized Coefficients | Standardized Coefficients | t    | p    |
|       | B              | Std. Error | Beta |      |      |
| 1 (Constant) | 11.694 | 1.198 | 9.760 | .000 |
| PSORIASIS DURATION | .466 | .155 | .305 | 3.005 | .003*|
| Dependent Variable: PSS (PERCEIVED STRESS) |       |       |       |      |

$p < 0.05 = $ statistical significance

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Table 6: Comparison of the quality of life in patients with psoriasis with and without depressive/anxiety disorders

| Variables qestion | Groups                            | Distribution of the Responses of patients to Questions | WHOQOL | Pearson Chi-Square | df | p    |
|-------------------|-----------------------------------|-----------------------------------------------|--------|-------------------|----|------|
|                   |                                   | Very poor | Poor | Neither poor nor good | Good | Very good             |      |
| WHOQOL question 1 | Psoriasis with anxiety/depression | 12       | 12   | 30                | 11   | 9                  | 26.715 | 4 | .000*|
|                   | Psoriasis without anxiety/depression | 0        | 0    | 2                 | 12   | 2                  |        |   |      |
| WHOQOL question 2 | Psoriasis with anxiety/depression | 16       | 10   | 30                | 11   | 7                  | 21.141 | 4 | .000*|
|                   | Psoriasis without anxiety/depression | 0        | 0    | 3                 | 10   | 3                  |        |   |      |

$p < 0.05 = $ Statistical significance
clinical variables on the mental health of patients with psoriasis. The foremost strength of this study was that patients were also screened for perceived stress.

**Prevalence of psychiatric morbidity in psoriatic patients**

Our study found an overall prevalence of depression of 78.9% in patients with psoriasis, of which 62.2% had moderate to severely moderate depression that would require psychiatric intervention. Various studies on patients with psoriasis have reported a prevalence of depression ranging from 28% to 67%, and reported "poor" to "very poor" satisfaction with their life was poor to very poor. Twenty-six (28.9%) patients reported that their quality of life was poor to very poor. The prevalence of depression in patients with psoriasis recorded in our study is higher than that observed by most of the other studies reviewed. Heterogeneity in the screening tools utilized across various studies could explain these variations, to an extent.

The overall prevalence of anxiety disorders among patients with psoriasis in our study was 76.7%. The prevalence of severe anxiety requiring psychiatric intervention was 22.2%. This is in partial agreement with findings of other studies reviewed here. The high prevalence of anxiety can be explained by the fact that patients attending the dermatology clinic have significant apprehension about the illness, duration and outcome of treatment, fear of investigations and anxiety concerning the financial aspects of treatment. However, these aspects were not studied and hence further research is required.

Studies have also highlighted the coexistence of both depressive and anxiety disorders in patients with psoriasis. Our study showed that 65 (72.2%) patients were positive for both depression and anxiety simultaneously, which is in agreement with previous research. In other words, patients with psoriasis diagnosed to have a depressive disorder are likely to have symptoms of anxiety as well.

PSS scores in patients with psoriasis in our study showed a mean score of 14.71. Fifty-one patients (56.7%) were considered to have a significant stress score, and twenty patients (22.2%) were found to have score ≥20 indicating severe degrees of perceived stress. These prevalence rates correlate with the findings of previous studies.

**Quality of life in patients with psoriasis**

Our study showed that, of the 90 patients analyzed, 24 (16.6%) patients reported that their quality of life was poor to very poor. Twenty-six (28.9%) patients reported "poor" to "very poor" satisfaction with their health. We found a negative correlation between psychiatric morbidity and two domains of WHOQOL; social relationship and environmental domain. Thus, impairment in social and environmental quality of life of patients with psoriasis is associated with higher psychological distress.

**Influence of sociodemographic profile on prevalence of psychiatric morbidity**

A major proportion of the study sample comprised of patients in their third to fifth decade of life, and a higher number of male subjects. Males in the third to fifth decade of life belong to the economically productive section of society. Hence, they are more likely to seek prompt treatment. The majority of the Indian studies have shown a similar gender difference in the distribution of psoriasis. Higher prevalence of psoriasis has been observed among males, with most of the patients presenting in their third or fourth decade of life.

Sociodemographic variables have consistently remained the least effective, in predicting psychiatric morbidity in patients with psoriasis. We found that only two sociodemographic variables showed weak association with psychiatric morbidity: Age with stress, and AD with depression.

In this study, age showed no significant association with anxiety and depression. As age increases, the PSS score also increases, however, by a very small amount. Sampogna et al. observed a similar finding, where psychological distress was higher in older patients with psoriasis.

We observed that the prevalence of depression was significantly increased if the patient with psoriasis was from a rural area. These findings can be explained by the fact that patients from a rural background usually belong to a lower economic status, have persistent financial burdens, lower education, difficulties with regard to basic necessities and access to health care. Hence, these patients are likely to have poor adherence to treatment and regular follow-ups, which further worsens the severity of psoriasis. But this observation needs to be interpreted with caution since most of our subjects hailed from a rural setting.

**Influence of clinical variables on prevalence of psychiatric morbidity**

As found in other studies, this study found a significant association between severity and duration of psoriasis and depression/anxiety/stress. The frequency of psychiatric morbidity is higher in patients with severe psoriasis. Our study also showed that there is a higher probability for patients with higher PASI scores to have a severe grade of depression/
anxiety. Similarly, the probability for patients with longer duration of psoriasis to have a severe grade of depression/anxiety was more.

The majority of the studies have observed a positive correlation between the severity of psoriasis and anxiety/depression. Several studies are currently being undertaken by research teams worldwide to further investigate into the neuropsychological basis of this association.

Comparison of severity of psoriasis and quality of life in patients with and without anxiety/depression

Previous studies have attempted to examine the impact of disease severity on the quality of life in patients with psoriasis and vice versa. The effect of psychiatric morbidity on severity of psoriasis has also been studied individually. None of the studies reviewed here have compared the quality of life and PASI scores in patients with and without psychiatric morbidity. We have tried to investigate the effect of depression/anxiety on quality of life and severity of psoriasis. This gives our study a methodological advantage. The proportion of patients reporting their quality of life as poor to very poor was significantly higher in patients of psoriasis with comorbid anxiety/depression. Patients of psoriasis with anxiety and depression had a significantly higher score on PASI. This study, however, had certain limitations. The study conducted on a small sample and was skewed toward male gender and a rural AD. The study was cross-sectional in nature, and, therefore, the impact of treatment was not assessed. Though the patients who scored positive on PHQ-9, GAD 7, and PSS were taken up for further diagnostic clinical interviews, those findings were not part of the study.

CONCLUSIONS AND IMPLICATIONS OF THE STUDY

The study highlights that depression, anxiety and stress are significantly high among patients with psoriasis. Quality of life was significantly lower in patients with psychiatric comorbidities. We found a complex relationship between psoriasis, psychiatric comorbidity and quality of life and the need for an integrated approach in the management of the disease. There is a need for routine screening of all patients with psoriasis for psychiatric comorbidities as early detection of these comorbidities is the first step in effective management. Research shows that psychological interventions improve clinical outcomes in patients with psoriasis. This needs to be established in the Indian sociocultural context. This would facilitate the integration of psychiatric and dermatological treatment. This would ultimately help in improving overall health outcomes and quality of life of psoriasis patients.

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Conflicts of interest
There are no conflicts of interest.

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