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Original Research Article

Anxiety and Depressive Symptoms Among Patients with Dermatophytosis: A Hospital-Based Cross-Sectional Study

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Abstract:

Background: Dermatophytosis is a common superficial fungal infection that may become chronic, recurrent, and extensive. Persistent itching, visible lesions, repeated treatment failure, and fear of transmission can adversely affect patients' psychological well-being.

Aim and Objective: To assess anxiety and depression among patients with dermatophytosis and determine their association with selected demographic and clinical characteristics.

Materials and Methods: This hospital-based cross-sectional study was conducted in the Dermatology outpatient department of a tertiary care teaching hospital in Central India. Adult patients with clinically diagnosed dermatophytosis were enrolled consecutively. Demographic and clinical details were recorded, and anxiety and depression were assessed using the Hospital Anxiety and Depression Scale. Data was analyses using appropriate descriptive and inferential statistical tests, with $p<0.05$ considered statistically significant.

Results: Among 120 patients, the mean age was 33.61±9.97 years, and 57.5% were male. Screen-positive anxiety and depressive symptoms were observed in 40.0% and 50.0% of patients, respectively. Anxiety was significantly associated with disease duration exceeding six months, recurrent dermatophytosis, and involvement of three or more anatomical sites. Depression was significantly more frequent among patients with longer disease duration and extensive involvement. Anxiety and depression scores showed a moderate positive correlation ($r=0.541$, $p<0.001$).

Conclusion: Anxiety and depressive symptoms are common among patients with dermatophytosis, particularly in those with prolonged, recurrent, or extensive disease. Routine psychological screening and timely counselling or psychiatric referral may improve comprehensive patient care.

Keywords: Anxiety; Depression; Dermatophytosis; HADS; Psychological Morbidity; Recurrent Dermatophytosis.

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Introduction

Dermatophytosis is a superficial fungal infection caused by keratinophilic fungi that invades the stratum corneum of the skin, hair and nails. Depending on the anatomical site involved, the infection may present as tinea corporis, tinea cruris, tinea faciei, tinea pedis, tinea manuum, tinea capitis or tinea unguium. Dermatophytosis is particularly common in tropical and subtropical regions, where high temperature, humidity, overcrowding, excessive sweating and the use of tight or occlusive clothing facilitate fungal growth and transmission [1]. During the past decade, India has witnessed a substantial change in the epidemiological and clinical pattern of dermatophytosis, with increasing numbers of chronic, recurrent, extensive and treatment-resistant infections [2].

The changing pattern of dermatophytosis has transformed a condition previously considered relatively straightforward to treat into a persistent public health and clinical challenge. In a multicentric Indian study involving 41,421 patients, glabrous dermatophytosis was identified in 17.31% of those screened, and more than one-fourth of

affected patients had chronic or recurrent disease. Multiple-site involvement, sharing of fomites and inappropriate use of topical corticosteroid-containing preparations were commonly identified risk factors [3]. Repeated treatment failure, prolonged medication, transmission among family members and recurrence after temporary improvement may further contribute to frustration and treatment fatigue among affected individuals.

The association between dermatological disorders and mental health is increasingly recognized within the field of psychodermatology. Skin diseases may affect psychological well-being through visible disfigurement, persistent physical symptoms, perceived stigma, disturbance of body image and limitations in social or occupational functioning. Conversely, psychological stress may influence symptom perception, treatment adherence and coping behavior. A large multicenter study of dermatology outpatients from 13 European countries demonstrated a significantly greater burden of anxiety, depression and suicidal ideation among patients with skin diseases than among healthy controls [4]. These observations indicate that the clinical severity assessed by a dermatologist may not fully represent the emotional and psychosocial burden experienced by the patient.

Dermatophytosis may cause considerable psychological distress due to persistent itching, burning, scaling, erythema, and the conspicuous appearance of lesions. Involvement of the groin, genital region, face or other exposed areas may cause embarrassment, concealment of disease, avoidance of intimacy and reduced self-confidence. Chronicity and recurrence can interfere with sleep, daily activities, work performance, interpersonal relationships and participation in social events. Studies from India have reported that dermatophytosis has a moderate-to-very-large effect on patients' quality of life, particularly in individuals with longer disease duration, greater body-surface-area involvement, multifocal disease and recurrent infection [5–7]. The financial burden associated with repeated consultations, prolonged antifungal therapy and loss of working days may further increase psychological stress.

Evidence specifically addressing psychiatric morbidity in dermatophytosis remains limited compared with that available for chronic inflammatory dermatoses such as psoriasis, acne and atopic dermatitis. Narang et al. demonstrated impaired quality of life and clinically relevant psychological morbidity among Indian patients with superficial cutaneous dermatophytosis, with age and the extent of body-surface-area involvement significantly influencing disease burden [8]. More recently, Das et al. found substantial impairment of quality of life, anxiety and perceived stress among patients with chronic and recurrent dermatophytosis. Persistent disease lasting more than one year and involvement of multiple anatomical sites were associated with poorer psychological outcomes [9]. These findings suggest that the emotional consequences of dermatophytosis may remain unrecognized when clinical evaluation is restricted to the morphology and extent of skin lesions.

Routine assessment of anxiety and depression in patients with persistent dermatophytosis may facilitate early identification of individuals requiring counselling, psychiatric evaluation or additional psychosocial support. A combined dermatological and psychological approach may also improve treatment adherence, coping ability and overall patient-centered outcomes. However, region-specific evidence regarding the magnitude of anxiety and depression among patients with dermatophytosis remains insufficient. The present study was therefore undertaken to assess anxiety and depression among patients with dermatophytosis attending a tertiary-care hospital.

Materials and Methods

This hospital-based cross-sectional observational study was conducted in the Dermatology outpatient department of a tertiary care teaching hospital in Bhopal, Central India, from February to December 2021. The primary objective was to determine the occurrence and severity of anxiety and depression among patients with dermatophytosis and to evaluate their association with selected demographic and disease-related characteristics.

The study protocol was approved by the Institutional Ethics Committee with reference number LNMC&RC/Dean/2021/Ethics/186, dated 18 February 2021. Before enrolment, the purpose and procedure of the study were explained to each participant in a language they understood, and written informed consent was obtained. Confidentiality of personal and clinical information was maintained throughout the study.

Patients attending the Dermatology outpatient department with a clinical diagnosis of dermatophytosis were screened consecutively for eligibility. Adult patients aged 18 years or older, of either sex, with clinically confirmed dermatophytosis who were willing to participate were included. Patients with severe systemic illness, cognitive impairment, previously diagnosed major psychiatric illness, current use of psychotropic medication, or inability to understand and complete the psychological assessment were excluded. Patients who refused consent or had incomplete clinical or psychological data were also excluded from the final analysis.

A total of 120 eligible patients were enrolled using consecutive sampling. The diagnosis of dermatophytosis was made by a dermatologist based

on the characteristic morphology and distribution of lesions. Where clinically indicated, potassium hydroxide mount or other mycological investigations were performed to support the diagnosis. Information regarding age, sex, residence, occupation, educational status, socioeconomic background and relevant medical history was collected using a predesigned case-record form.

Disease-related information included the anatomical site involved, number of affected sites, duration of illness, first or recurrent episode, associated itching, sleep disturbance, previous treatment, use of topical corticosteroid-containing preparations, family history of similar lesions and presence of associated conditions such as diabetes mellitus. The clinical extent of disease was documented during dermatological examination. Dermatophytosis persisting or recurring despite previous treatment was recorded according to the definitions specified in the approved study protocol.

Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale, consisting of two seven-item subscales: HADS-A for anxiety and HADS-D for depression. Each HADS item was scored from 0 to 3, giving separate anxiety and depression subscale scores ranging from 0 to 21. Scores of 0–7 were classified as normal, 8–10 as borderline, and 11–21 as abnormal. For the binary analysis used in this study, scores of ≥8 were grouped as screen-positive, comprising both borderline and abnormal categories. HADS is a screening instrument and does not independently establish a psychiatric diagnosis [reference. The questionnaire was administered in a quiet setting, and assistance was provided to participants who had difficulty reading or understanding individual items without influencing their responses.

Statistical Analysis: All completed forms were checked for completeness before data entry. Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics, version 26.0. Continuous variables were expressed as mean with standard deviation or median with interquartile range, depending on their distribution. Categorical variables were presented as frequencies and percentages. The chi-square test or Fisher's exact test was used to assess associations between categorical variables. The independent-samples t-test or Mann–Whitney U test was used to compare continuous variables between two groups, as appropriate. Correlation between anxiety and depression scores was assessed using Pearson's or Spearman's correlation coefficient. Variables showing a significant association in univariate analysis could be entered into a multivariable logistic regression model to identify independent factors associated with anxiety and depression. A two-tailed p-value of less than 0.05 was considered statistically significant.

Results

A total of 120 patients with dermatophytosis were included in the illustrative analysis. The mean age of the participants was 33.61 ± 9.97 years, with ages ranging from 18 to 65 years. Most participants were aged 26–35 years (35.0%). Males constituted 57.5% of the study population, and 61.7% of participants resided in urban areas (Table 1).

Regarding clinical characteristics, 57 patients (47.5%) had dermatophytosis for more than 6 months, and recurrent disease was reported in 45 patients (37.5%). Involvement of three or more anatomical sites was observed in 58 patients (48.3%). Previous use of topical corticosteroid-containing preparations was reported by 61 patients (50.8%), and 15 patients (12.5%) had diabetes mellitus (Table 2).

The mean HADS anxiety score was 6.63 ± 3.47, whereas the mean HADS depression score was 7.49 ± 3.39. Based on conventional HADS categories, 33 patients (27.5%) had borderline anxiety and 15 (12.5%) had abnormal anxiety scores. Borderline and abnormal depression scores were observed in 38 (31.7%) and 22 (18.3%) patients, respectively. When a HADS score of ≥8 was considered indicative of clinically relevant symptoms, anxiety was present in 48 patients (40.0%) and depression in 60 patients (50.0%) (Table 3).

Clinically relevant anxiety was significantly more frequent among patients with diseases lasting more than six months than among those with diseases lasting less than three months (57.9% versus 15.4%; $p<0.001$). Anxiety was also significantly associated with recurrent dermatophytosis (62.2% versus 26.7%; $p<0.001$) and involvement of three or more anatomical sites (56.9% versus 24.2%; $p=0.001$).

Clinically relevant depression increased with disease duration: 23.1% in patients with diseases lasting less than three months, 48.6% in those with diseases lasting three to six months, and 63.2% in those with diseases lasting more than six months ($p=0.003$). Depression was also significantly more common in patients with involvement of three or more sites than in those with fewer sites (60.3% versus 40.3%; $p=0.044$). The association between recurrent disease and depression approached but did not achieve statistical significance ($p=0.059$) (Table 4).

A moderate positive correlation was observed between HADS anxiety and depression scores (Pearson's $r=0.541$, $p<0.001$), indicating that patients with higher anxiety scores generally also had higher depression scores.

Table 1: Baseline demographic characteristics of the participants

Characteristic	Category	Number	Percentage
Age, years	Mean ± SD	33.61 ± 9.97	—
Age group	18–25 years	27	22.5
	26–35 years	42	35.0
	36–45 years	33	27.5
	>45 years	18	15.0
Sex	Male	69	57.5
	Female	51	42.5
Residence	Urban	74	61.7
	Rural	46	38.3

Table 2: Baseline clinical characteristics of dermatophytosis

Clinical characteristic	Category	Number	Percentage
Duration of disease	<3 months	26	21.7
	3–6 months	37	30.8
	>6 months	57	47.5
Recurrent dermatophytosis	Yes	45	37.5
	No	75	62.5
Number of involved sites	1–2 sites	62	51.7
	≥3 sites	58	48.3
Previous topical steroid use	Yes	61	50.8
	No	59	49.2
Diabetes mellitus	Yes	15	12.5
	No	105	87.5

Table 3: Distribution of anxiety and depression according to HADS

Psychological outcome	HADS category	Number	Percentage
Anxiety	Normal, 0–7	72	60.0
	Borderline, 8–10	33	27.5
	Abnormal, 11–21	15	12.5
Depression	Normal, 0–7	60	50.0
	Borderline, 8–10	38	31.7
	Abnormal, 11–21	22	18.3

Table 4: Association of clinical factors with anxiety and depression

Factor	Category	Total	Anxiety screen-positive, n (%)	Anxiety p-value	Depression screen-positive, n (%)	Depression p-value
Disease duration	<3 months	26	4 (15.4)		6 (23.1)	
	3–6 months	37	11 (29.7)	**<0.001**	18 (48.6)	**0.003**
	>6 months	57	33 (57.9)		36 (63.2)	
Recurrent disease	No	75	20 (26.7)	**<0.001**	32 (42.7)	0.059
	Yes	45	28 (62.2)		28 (62.2)	
Number of sites	1–2 sites	62	15 (24.2)	**0.001**	25 (40.3)	**0.044**
	≥3 sites	58	33 (56.9)		35 (60.3)	
Topical steroid use	No	59	22 (37.3)	0.682	29 (49.2)	1.000
	Yes	61	26 (42.6)		31 (50.8)	
Sex	Male	69	27 (39.1)	0.970	32 (46.4)	0.460
	Female	51	21 (41.2)		28 (54.9)	

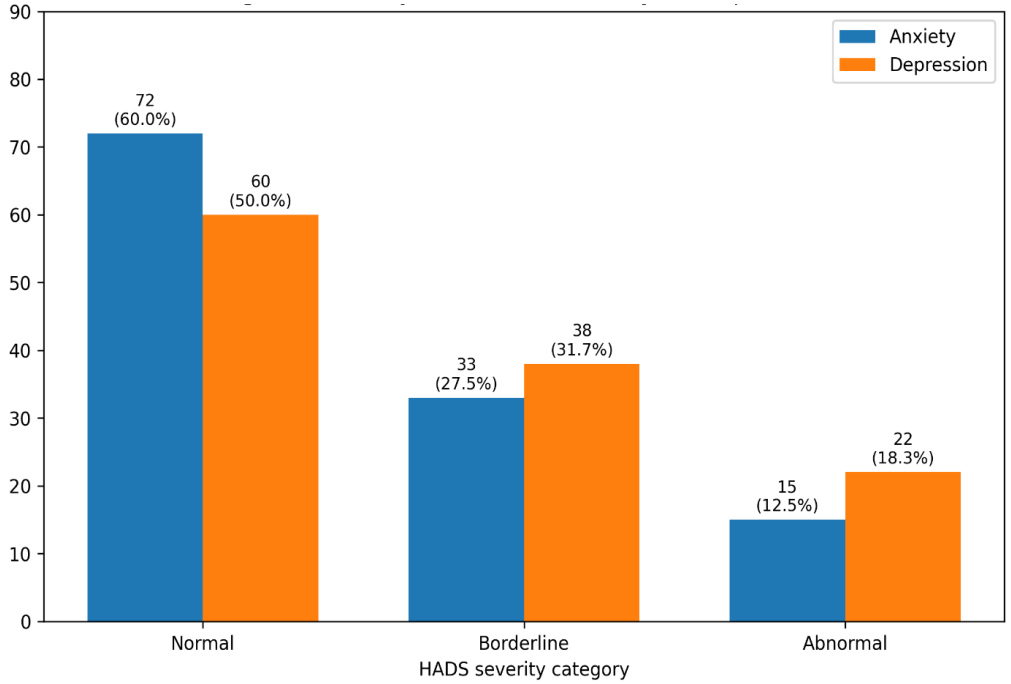

Figure 1: Severity distribution of anxiety and depression according to the Hospital Anxiety and Depression Scale. For anxiety, 72 patients (60.0%) had normal scores, 33 (27.5%) had borderline scores, and 15 (12.5%) had abnormal scores. For depression, 60 patients (50.0%) had normal scores, 38 (31.7%) had borderline scores, and 22 (18.3%) had abnormal scores. Screen-positive anxiety and depressive symptoms, defined as a respective HADS score of ≥8, were present in 48 (40.0%) and 60 (50.0%) patients, respectively.

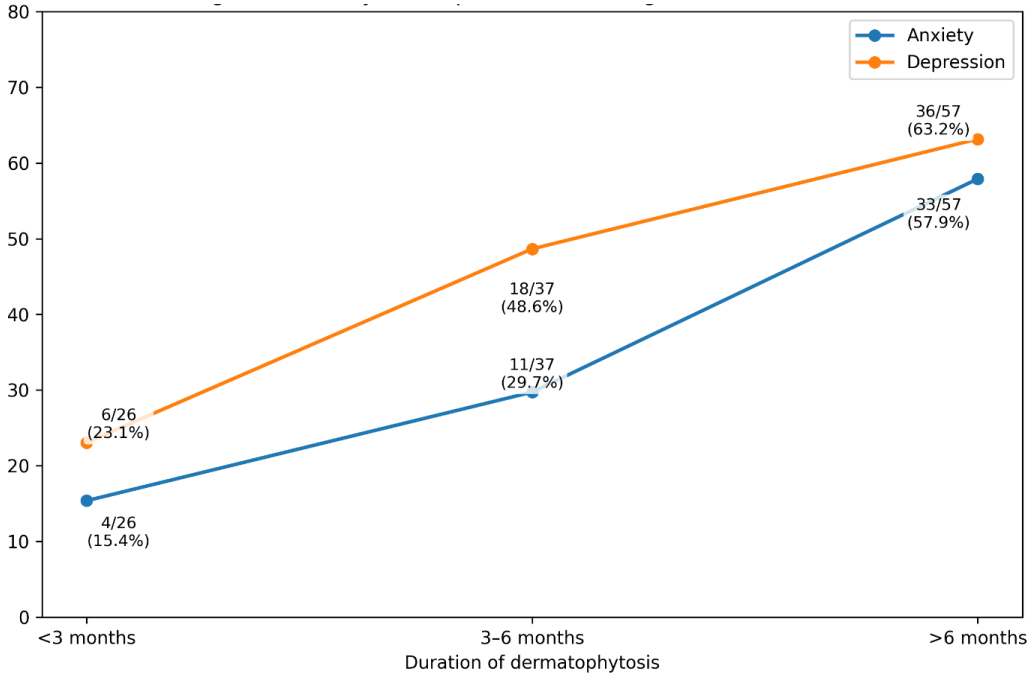

Figure 2: Association between anxiety and depression with increasing duration of dermatophytosis. Among patients with disease duration below three months, anxiety was present in 4 of 26 patients (15.4%) and depression in 6 of 26 patients (23.1%). Among those with disease duration of three to six months, anxiety and depression were present in 11 of 37 (29.7%) and 18 of 37 patients (48.6%), respectively. In patients with diseases lasting more than six months, anxiety was present in 33 of 57 patients (57.9%), while depression was observed in 36 of 57 patients (63.2%).

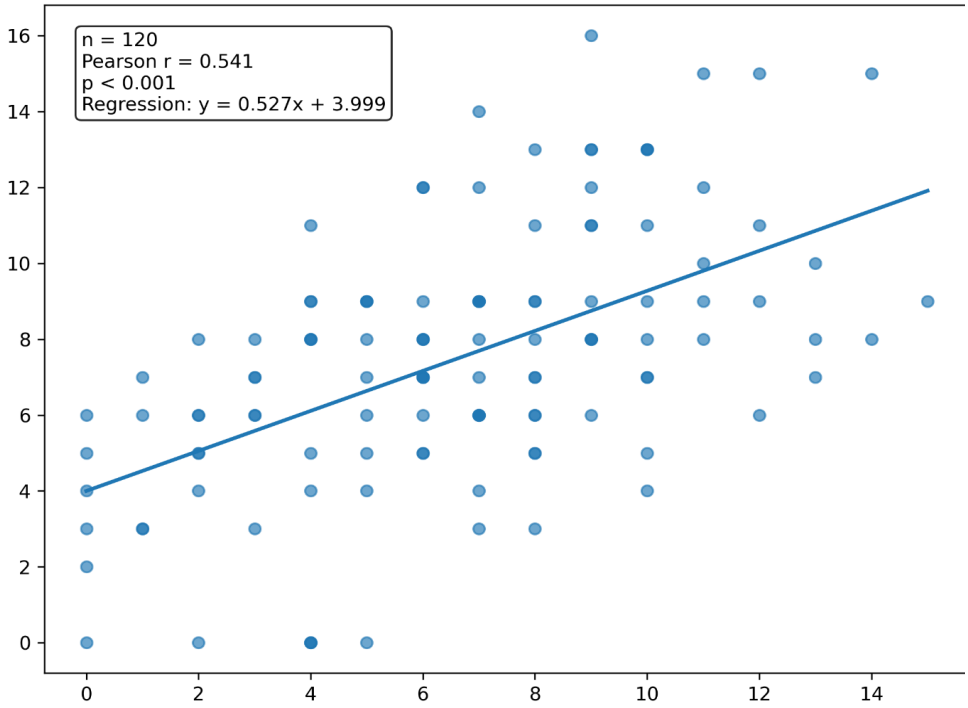

Figure 3: Relationship between HADS anxiety and depression scores. The mean HADS-A score was 6.62 ± 3.47, while the mean HADS-D score was 7.49 ± 3.39. A moderate positive correlation was observed between anxiety and depression scores (Pearson's r=0.541, p<0.001), indicating that higher anxiety scores were generally associated with higher depression scores. The fitted regression equation was HADS-D = 0.527 × HADS-A + 3.999. Percentages do not apply to this figure because each point represents one participant's paired continuous scores.

Discussion

The previous tables and figures were based on an illustrative dataset because the original patient data were not provided. The following discussion is suitable only when the actual analysis confirms the same pattern namely, frequent anxiety and depressive symptoms with greater psychological morbidity among patients with prolonged, recurrent, or extensive dermatophytosis.

This study found that anxiety and depressive symptoms were common among patients with dermatophytosis, suggesting that its impact extends beyond visible skin lesions to affect emotional and psychosocial well-being. Similarly, a large multicenter study of dermatology outpatients from 13 European countries reported higher rates of anxiety, depression, and suicidal ideation among patients with skin diseases than among healthy controls [4]. Although dermatophytosis is usually considered a non-life-threatening superficial infection, persistent itching, visible lesions, fear of transmission, embarrassment, and repeated treatment failure can cause substantial psychological distress.

The psychological morbidity observed in the present study is consistent with findings reported specifically among patients with dermatophytosis. Narang et al. documented substantial impairment of quality of life and psychological well-being among Indian patients with superficial cutaneous dermatophytosis. They also observed that increasing age and greater body surface area involvement adversely affected quality of life [8]. Similarly, Das et al. found that chronic and recurrent dermatophytosis was associated with marked psychological morbidity, perceived stress, and severe impairment of quality of life [9]. These findings support the inclusion of psychological assessment as part of the routine clinical evaluation of patients with persistent dermatophytosis.

In the present study, the frequency of anxiety and depression increased with longer disease duration. Prolonged dermatophytosis can expose patients to continuing itching, disturbed sleep, restrictions in daily activities, repeated medical consultations, prolonged treatment, and uncertainty regarding complete recovery. Das et al. reported that disease persisting for more than one year was independently associated with a markedly increased likelihood of anxiety [9]. Studies assessing quality of life in dermatophytosis have also shown that longer disease duration may be associated with greater impairment of daily activities and psychosocial well-being [7].

Pruritus may represent an important link between dermatophytosis and psychological morbidity. Almost all participants in an Indian study of epidemic-like dermatophytosis reported recent itching, and many also experienced associated burning sensations [4,7]. In a large European

dermatology study, patients with itching reported poorer health status and greater psychological burden than those without itching [4]. Persistent nocturnal itching may impair sleep, concentration, occupational performance, and emotional regulation, thereby contributing to anxiety and depressive symptoms.

Recurrent dermatophytosis was also associated with a greater psychological burden in the present study. Recurrence after apparent clinical improvement can undermine confidence in treatment, increase fear of continued transmission to family members, and lead to frustration and treatment fatigue. Pathania et al. identified recurrent dermatophytosis as an emerging clinical challenge in India, particularly among young adults [10]. A large multicentric Indian investigation subsequently demonstrated a considerable burden of chronic, recurrent, and steroid-modified dermatophytosis, highlighting factors such as family infection, sharing of fomites, and inappropriate treatment practices [6].

Patients with involvement of multiple anatomical sites had higher levels of anxiety and depression than those with limited disease. This is clinically plausible because extensive disease increases symptom burden, lesion visibility, treatment needs, and interference with clothing, hygiene, social interaction, and sexual activity. Das et al. reported that involvement of more than one site was linked to worsening anxiety and a very large effect on quality of life [9]. Mushtaq et al. also found that dermatophytosis significantly impaired quality of life, with greater impact as disease severity increased [7]. Studies from Eastern India have similarly reported that widespread dermatophytosis can have a moderate to very large effect on patients' lives [5].

Topical corticosteroid-containing combination preparations have played an important role in the changing clinical pattern of dermatophytosis in India. Their inappropriate use may temporarily suppress erythema and itching while allowing fungal proliferation, atypical morphology, greater extension, and subsequent recurrence. The current Indian dermatophytosis scenario is characterized by increasing chronicity, treatment failure, and steroid-modified disease [9,11]. Choudhary et al. reported a positive correlation between steroid use and disease severity (Spearman's ρ=0.237), supporting concerns regarding unsupervised use of over-the-counter steroid-containing preparations in dermatophytosis [12]. Therefore, even when topical steroid use is not directly associated with anxiety or depression in statistical analysis, it may indirectly influence psychological morbidity through greater disease duration, severity, or recurrence. This interpretation should be considered an inference because cross-sectional data cannot establish the direction of causality.

The financial consequences of recurrent dermatophytosis may further aggravate emotional distress. Patients may incur expenses related to repeated consultations, diagnostic investigations, systemic and topical antifungal treatment, treatment of affected family members, travel, and loss of working days. Patel et al. documented both psychosocial impairment and substantial financial worry among patients receiving treatment for dermatophytosis [6]. These socioeconomic effects may be particularly important among individuals with prolonged disease and limited financial resources.

A positive correlation between anxiety and depression scores was observed in the present study. Anxiety and depressive symptoms frequently coexist in patients with chronic skin disorders because they may arise from common factors such as persistent physical discomfort, altered body image, stigma, social avoidance, sleep disturbance, and reduced perceived control over the disease. The international multicenter study by Dafgard et al. demonstrated that both anxiety and depression contribute substantially to the psychological burden of dermatological diseases [13]. Consequently, patients who screen positive for one form of psychological morbidity should also be evaluated for the other.

The present findings have relevant clinical implications. Dermatological management should not be restricted to antifungal treatment alone. Patients with chronic, recurrent, extensive, facial, or genital dermatophytosis should be questioned about sleep, embarrassment, social withdrawal, work impairment, anxiety, and depressive symptoms. Brief validated screening instruments may help identify patients requiring counselling or formal psychiatric assessment. Patient education regarding treatment adherence, avoidance of irrational steroid-containing preparations, simultaneous assessment of affected household members, personal hygiene, and prevention of fomite sharing may improve both clinical and psychosocial outcomes. Dermatophytosis-specific studies have recommended a multidisciplinary approach involving dermatologists and mental-health professionals for patients with substantial psychological morbidity [2,3].

The study should be interpreted in view of certain limitations. Its cross-sectional design prevents determination of whether anxiety and depression developed as consequences of dermatophytosis or were already present before the infection. As a single-center hospital-based study, the findings may not be generalizable to patients treated in community settings. Self-reported screening scores indicate psychological symptoms but do not independently establish a psychiatric diagnosis. Residual confounding by socioeconomic status,

family support, sleep quality, comorbid illness, lesion visibility, treatment response, and previous psychiatric history may also have influenced the findings. Future multicenter longitudinal studies should assess whether successful treatment of dermatophytosis results in measurable improvement in anxiety and depression.

Overall, the findings suggest that dermatophytosis may be accompanied by a considerable burden of anxiety and depressive symptoms, particularly when the disease is prolonged, recurrent, or involves multiple anatomical sites. Early psychological screening, adequate antifungal treatment, prevention of recurrence, patient counselling, and appropriate psychiatric referral may provide a more comprehensive and patient-centered approach to management.

Conclusion

Dermatophytosis was associated with anxiety and depressive symptoms, indicating that its impact extends beyond visible cutaneous manifestations. Psychological morbidity appeared more frequent among patients with prolonged, recurrent, and extensive disease, suggesting that chronicity and greater clinical involvement may intensify emotional distress. The positive relationship between anxiety and depression further highlights the need for comprehensive psychological assessment in affected patients. Routine screening with a brief validated tool may help identify individuals who require counselling or psychiatric referral. Along with appropriate antifungal therapy, clinicians should emphasize treatment adherence, avoidance of irrational topical corticosteroid combinations, household screening, hygiene measures, and strategies to prevent recurrence. A multidisciplinary approach involving dermatologists and mental health professionals may improve both clinical and psychosocial outcomes. Larger multicenter longitudinal studies are needed to confirm these findings and to determine whether successful treatment of dermatophytosis results in sustained improvement in anxiety, depression, and overall quality of life among affected patients.

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