

Steroid abuse, quality of life, and various risk factors in dermatophytosis: a cross-sectional observational study from a tertiary care center in northern India

Dilip Meena¹, Neirita Hazarika², Payal Chauhan^{3✉}, Pratika Goyal⁴

¹Department of Dermatology, Venereology, and Leprology, Teerthanker Mahaveer Medical College and Research Center, Moradabad, Uttar Pradesh, India. ²Department of Dermatology, Venereology, and Leprology, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India. ³Department of Dermatology, Venereology, and Leprology, All India Institute of Medical Sciences, Bilaspur, Himachal Pradesh, India. ⁴Dr. Raman Goyal Eye and Maternity Hospital, Faridkot, Punjab, India.

Abstract

Introduction: Dermatophytosis is a superficial cutaneous mycosis and is steadily progressing to epidemic proportions in India. Various factors such as steroid overuse and misuse are currently making its treatment challenging. The study examines various sociodemographic characteristics, clinical factors, and steroid abuse in patients with dermatophytosis and also assess their quality of life (QOL).

Methods: A hospital based cross sectional study was carried out for a period of 1 year among adult patients with dermatophytosis after obtaining informed written consent. Sociodemographic and clinical details were recorded, and QOL was assessed with the Dermatology Life Quality Index (DLQI) questionnaire.

Results: Among 550 patients analyzed, the most common dermatophytosis was tinea ($n = 408/550$, 74.18%), dominated by tinea cruris and tinea corporis. Steroid abuse was frequent ($n = 511/550$, 92.90%), the most common being clobetasol propionate ($n = 26/52$, 50%). Hypopigmentation and atrophy were the most common side effects (53.52%). The mean DLQI was 14.44 ± 7.29 in males and 15.78 ± 6.26 in females. DLQI scores were statistically influenced ($p < .05$) by steroid abuse, low socioeconomic status, young adult status, widespread tinea, and poor hygiene.

Conclusions: Dermatophytosis was found to have a significant adverse impact on QOL. As seen in this study, the widespread abuse of steroids may be a leading cause of the emergence of recalcitrant tinea in India.

Keywords: dermatophytosis, tinea, fungal infection, DLQI

Received: 15 July 2022 | Returned for modification: 29 August 2022 | Accepted: 17 November 2022

Introduction

Dermatophytoses are cutaneous mycoses that infect the nails, skin, and hair. Causative organisms are fungi belonging to three genera: *Microsporum*, *Trichophyton*, and *Epidermophyton*. Dermatophytoses constitute the most common infective dermatoses encountered in dermatology outpatient departments (1). It is estimated that superficial fungal infections affect roughly 20 to 25% of the world population (2). The reported prevalence of dermatophytosis in India ranges from 36.6 to 78.4% (3, 4). This is attributable to socioeconomic status, promiscuity, prolonged contact with animals, poor hygiene conditions, and environmental factors such as high temperatures and relative humidity, which provide conditions favorable to fungal dispersion and development (5). Many studies have been carried out on quality of life (QOL) in chronic skin conditions such as psoriasis, vitiligo, and urticaria, but there are only limited studies assessing QOL in dermatophytosis (6–8). Verma et al. reported a very large and extremely large effect on the Dermatology Life Quality Index (DLQI) for 26.3% and 40.8% of dermatophytosis patients, respectively (9). A similarly significant impact on QOL was recently reported by Narang et al. and Mushtaq et al. (10, 11).

The study examines various sociodemographic characteristics, clinical factors, and steroid abuse in patients with dermatophytosis and also assess their quality of life (QOL).

Methods

Study design and setting

This was a descriptive, observational, cross-sectional study conducted in the dermatology department of a tertiary care hospital in northern India from July 2018 to June 2019, using the STROBE checklist. Ethical clearance was obtained from the Institutional Ethics Committee. A total of 550 patients were analyzed on their first visit to the hospital, with zero drop-out. No patients refused to participate in the study. Consecutive patients of both sexes over 18 years old were included after obtaining written informed consent. A detailed clinical history was taken, and cutaneous lesions were examined. Thereafter, the lesions were subjected to mycological examination (performed with 10% KOH for all skin scraping samples) on the first visit. Patients with both clinical diagnosis of dermatophytosis and positive mycological findings were recruited. No follow-up was performed. Exclusion criteria were patients under 18 years old and patients with a negative KOH examination.

Patient assessment

A detailed history was taken, including demographic factors such as age, sex, occupation, education, and monthly income. The pa-

✉ Corresponding author: chauhanpayal89@gmail.com

tients were asked about the onset and progression of symptoms, precipitating factors, hygiene habits, family involvement, comorbidities, history of atopy, seasonal exacerbation, treatment taken, and use of steroids (topical, oral, or both). A cutaneous examination was conducted to document clinical type(s) of tinea, number of areas involved, morphology, and skin changes related to steroid abuse.

Assessment of QOL was performed using the DLQI (12). Patients were asked to self-administer the DLQI questionnaires in English or Hindi. For illiterate patients, questions were read out and explained to them in a language understood by them, and their responses were recorded accordingly. The DLQI questionnaire (used after formal written permission) grades QOL by assessing the following domains: a) physical symptoms and feelings (Q1, Q2), b) daily activities (Q3, Q4), c) leisure (Q5, Q6), d) work/school (Q7), e) personal relationships (Q8, Q9), and f) treatment (Q10). Each question is scored on a four-point Likert scale (score 3–0) with regard to the problems faced the previous week due to the disease. The final DLQI score is the sum of all scores (0–30) and is interpreted as follows: 0–1 = no effect on the patient's life, 2–5 = small effect, 6–10 = moderate effect, 11–20 = very large effect, and 21–30 = extremely large effect.

Statistical analysis

Statistical analysis was performed using SPSS software (version 26; SPSS Inc., Chicago, IL, USA). The quantitative variables were expressed as mean \pm standard deviation, and the qualitative variables were expressed in percentages. The association of DLQI scores with disease characteristics was performed using a *t*-test, one-way analysis of variance (ANOVA), and post-hoc Bonferroni test, as applicable.

Results

Demographic data

A total of 550 patients with dermatophytosis were enrolled in the study, of which 62.91% ($n = 346/550$) were males. The male-to-female ratio was 1.69:1. The age of the patients ranged from 18 to 77, with a mean age of 32.14 ± 12.17 . The most prevalent age group was 18 to 30, corresponding to 55.27% of the patients ($n = 304/550$). Out of 550 patients, 89.63% ($n = 493/550$) were literate, further classified into patients that had completed primary, secondary, or tertiary education. A total of 60.54% of patients ($n = 333/550$) were in the monthly income group of 5,000 to 15,000 rupees.

Two hundred and forty-two patients (44%) had a recent onset of tinea, with a disease duration of less than 6 months. The average duration of disease was 11.86 ± 14.31 months. A history of seasonal exacerbation was present in 45.81% of patients ($n = 252/550$). Out of these, 86.11% ($n = 217/252$) had experienced it during the summer. A known history of diabetes was found in only 3.09% of cases ($n = 17/550$), and only 5.81% of cases ($n = 32/550$) had atopy.

Various combinations of tinea cruris, tinea corporis, or tinea faciei were experienced by 74.18% of patients ($n = 408/550$). When presented alone, tinea cruris was the most common variant in 63.38% ($n = 90/142$). The clinico-demographic characteristics of patients are summarized in Table 1.

Hygiene practices

A total of 87.27% of patients ($n = 480/550$) reported taking a daily bath, and most of the rest (9.45%, $n = 52/550$) took baths about three times a week (Fig. 1). Up to 92% ($n = 506/550$) said they use soap when bathing. Among patients not using soap, 52.27% ($n = 23/44$) said that using soap aggravates the disease. A total of 95.09% ($n = 523/550$) reported using a towel. Among these, 14.72% ($n = 77/523$) washed their towel on alternate days, 35.56% ($n = 186/523$) washed their towel twice a week, 17.59% ($n = 92/523$) washed their towel once a week, and 34.41% ($n = 180/523$) washed their towel less than once a week. A total of 47.03% of cases ($n = 246/550$) shared their towel with their family members. Altogether, 24.91% ($n = 137/550$) reported using an antiseptic solution, such as Dettol® or Savlon®. A total of 83.27% of patients ($n = 458/550$) reported changing undergarments daily. Regarding laundering, using a washing machine was reported by 33.64% ($n = 185/550$), washing by hand by 63.82% ($n = 351/550$), and both by 2.54% ($n = 14/550$). A total of 92.54% ($n = 509/550$) use squat toilets.

Steroid abuse

Use of topical steroids to treat fungal infections either singly or in combination was found in a staggering 92.90% of patients ($n = 511/550$). Out of these, 89.82% ($n = 459/511$) used steroids in combination formulations with various antifungals and antibiotics. When used as a single agent ($n = 52$), clobetasol propionate was the most commonly used topical steroid in 50% of patients ($n = 26/52$), followed by beclomethasone in 23% ($n = 12/52$), mometasone in 21% ($n = 11/52$), and fluticasone in 6% ($n = 3/52$).

Table 1 | Clinico-demographic characteristics.

Characteristics	n (%)
Total respondents	550 (100.00)
Sex	
Male	346 (62.91)
Female	204 (37.09)
Age groups	
18–30 years	304 (55.27)
> 30 years	246 (44.73)
Education	
None (illiterate)	57 (10.36)
Primary	110 (20.00)
Secondary	189 (34.36)
Tertiary	194 (35.27)
Income (rupees)	
< 5,000	59 (10.73)
5,000–15,000	333 (60.55)
15,000–30,000	95 (17.27)
> 30,000	59 (10.73)
Employment	
Unemployed	128 (23.27)
Employed	280 (50.91)
Others	142 (25.82)
Duration of illness	
0–6 months	242 (44.00)
6 months – 1 year	204 (37.09)
> 1 year	104 (18.18)
Type of tinea	
Tinea corporis	44 (8.00)
Tinea cruris	90 (16.36)
Tinea faciei	8 (1.45)
Combination	408 (74.18)
Seasonal variation	
Summer	217 (39.45)
Winter	10 (1.82)
Rainy	25 (4.55)
No effect	298 (54.18)
Personal/family history of atopy	
No	518 (94.18)
Yes	32 (5.82)
Personal history of diabetes	
No	533 (96.91)
Yes	17 (3.09)

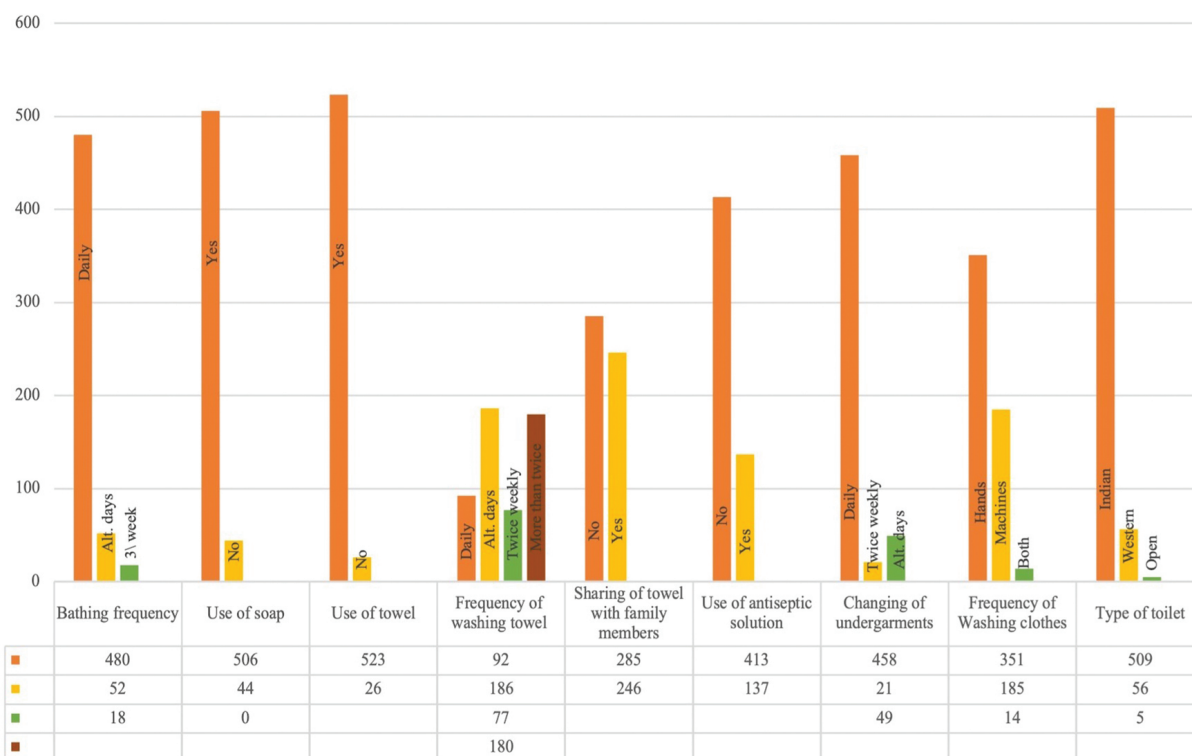


Figure 1 | Hygiene practices observed in patients with dermatophytosis.

Steroid use was recommended by pharmacists in about 28.36% of patients ($n = 145/511$), followed by MBBS (bachelor of medicine, bachelor of surgery) doctors, homeopathy/Ayurvedic doctors, friends and family, and self-medication, and rarely by a dermatologist (Fig. 2). A total of 59.49% of patients ($n = 304/511$) used steroid creams intermittently, and the remaining 40.51% ($n = 207/511$) used a cream continuously for more than 6 weeks. Out of these, 33.26% ($n = 170/511$) had cutaneous side effects due to topical steroid use. The most common side effect was hypopigmentation, seen in 31.17% ($n = 53/170$), followed by atrophy in 22.35% ($n = 38/170$), striae in 14.70% ($n = 25/170$) (Fig. 3), telangiectasia in 12.35% ($n = 21/170$), acneiform eruption in 9.41% ($n = 16/170$), hirsutism in 5.88% ($n = 10/170$), and a combination of various cutaneous side effects in 4.11% ($n = 7/170$).

DLQI in relation to various parameters

A statistically significant difference ($p < 0.05$) was noted in mean DLQI among both sexes, different age groups, education level of patients, income status, duration of illness, clinical types of tinea, history of steroid use, and bathing frequencies, as shown in Table 2.

The inter-group comparison of mean DLQI was performed using the posthoc Bonferroni test. When DLQI was compared among different age groups, the difference was found to be significant. The mean DLQI was significantly higher among those 18 to 30 years old ($16.49, p = 0.005$) and 31 to 40 years old ($14.38, p = 0.023$) when compared to patients over 60 (8.76).

The DLQI in relation to various parameters was studied. It was significantly higher in females, illiterates versus those with tertiary education (16.91 ± 6.21 vs. $14.34 \pm 7.02, p = 0.001$), patients with longer duration of disease (14.45 ± 6.93 for < 6 months vs. 16.84 ± 6.72 for > 1 year, $p = 0.026$), those with monthly income less than 5,000 rupees versus monthly income over 30,000 rupees (16.58 ± 7.13 vs. $12.95 \pm 6.26, p = 0.027$), those with bathing frequency twice a week versus daily (16.78 ± 7.18 vs. $14.77 \pm 7.00, p = 0.023$), those

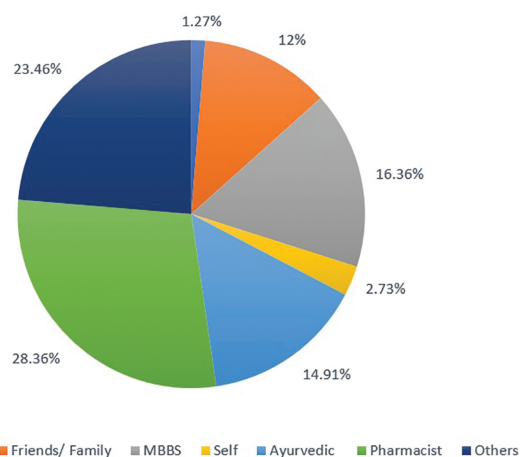


Figure 2 | Recommendation or prescription of steroids in dermatophytosis.



Figure 3 | Tinea corporis with striae and atrophy due to prolonged application of topical steroids.

who change undergarments more than once a week versus daily (15.65 ± 06.85 vs. 12.86 ± 07.28), and those with towel washing frequency once a week or less versus more than once a week (16.79 ± 06.90 vs. 13.56 ± 7.10).

The mean DLQI was also found to be higher in patients that hand launder their clothes versus machine laundering (15.21 ± 6.89 vs. 14.51 ± 7.09) and in patients that had more than one type of tinea versus only one type of tinea (15.87 ± 6.69 vs. 11.88 ± 6.77 ; Fig. 4), without any significant difference in DLQI in individual variants.



Figure 4 | Tinea corporis with a well-defined, annular, polycyclic, scaly plaque with a raised erythematous border without central clearing. Patchy areas of hypopigmentation are visible.

Discussion

An alarming increase in chronic and recurrent dermatophytosis has been reported in India in recent years. Baur et al. reported dermatophytosis as the second most common infectious disease (10.7%, $n = 24/225$) seen in the outpatient department of a tertiary medical center in Calcutta (Kolkata). The same study also reported that tinea infection (37.5%) was second only to folliculitis among common causes of recurrent visits to the dermatology outpatient department. Similar reports indicating the extent of this condition exist from other centers in India, namely Odisha, Himachal Pradesh, and West Bengal (13–15).

As the magnitude of dermatophytosis has increased in India, so has the use of topical steroids. As an anti-inflammatory drug, it swiftly but temporarily reduces erythema, scaling, and itching in tinea. Patients then keep using these drugs on their own for several weeks to months. They finally present to a dermatologist with the consequences of this overuse in the form of striae, hypopigmentation, skin atrophy, hypertrichosis, and sudden worsening of symptoms on withdrawal of topical steroids. Recent studies indicate that use of over-the-counter topical steroid preparations has been greater than even topical antifungals in dermatophytosis patients (16).

Table 2 | Dermatology Life Quality Index (DLQI) by various parameters.

Parameters	DLQI \pm SD	p-value
Sex		
Male	14.44 \pm 7.29	0.028
Female	15.78 \pm 6.26	
Age groups (years)		
18–30	16.49 \pm 7.18	0.005
31–40	14.38 \pm 6.85	
41–50	13.66 \pm 6.08	
51–60	11.83 \pm 6.02	
> 60	8.76 \pm 4.82	
Education		
None (illiterate)	16.91 \pm 6.21	0.001
Primary	16.07 \pm 6.53	
Secondary	15.38 \pm 7.31	
Tertiary	14.34 \pm 7.02	
Monthly income (rupees)		
< 5,000	16.58 \pm 7.13	0.027
5,000–15,000	15.35 \pm 6.83	
15,000–30,000	13.75 \pm 7.32	
> 30,000	12.95 \pm 6.26	
Duration of illness		
< 6 months	14.45 \pm 6.93	0.026
6 months – 1 year	15.06 \pm 7.06	
> 1 year	16.84 \pm 6.72	
Type of tinea		
Corporis	13.77 \pm 7.46	0.001
Cruris	11.88 \pm 7.77	
Faciei	8.13 \pm 4.73	
Combination of > 1 type	15.87 \pm 6.69	
History of steroid abuse		
Yes	15.28 \pm 6.88	0.001
No	10.41 \pm 6.27	
Bathing frequency		
Daily	14.77 \pm 7.00	0.023
Three times a week	16.58 \pm 6.22	
Twice a week	16.78 \pm 7.18	
Change of undergarments		
Daily	12.86 \pm 07.28	0.039
More than once a week	15.65 \pm 06.85	
Towel washing frequency		
More than once a week	13.56 \pm 7.10	0.027
Alternate days	13.56 \pm 7.10	
Twice a week	13.83 \pm 6.71	
Once a week or less	16.79 \pm 6.90	
Laundering clothes		
By hand	15.21 \pm 6.89	0.042
Machine	14.51 \pm 7.09	
Both	13.64 \pm 6.43	

DLQI = Dermatology Life Quality Index, SD = standard deviation.

A total of 550 patients with dermatophytosis were enrolled in this study, which was carried out over 1 year. The study showed that dermatophytosis affects both sexes, with a slight male preponderance. The male-to-female ratio was 1.69:1. Baur et al. have also reported a slight male predominance (15), whereas Noronha et al. reported a male-to-female ratio of 1.63:1. The higher incidence in males may be related to their occupation and working conditions (17).

The highest prevalence of dermatophytosis in this study was in the 18–30 age group (Table 2). Araújo et al. (18) found that patients 0 to 20 years old accounted for nearly half of all cases of dermatophytosis in the Brazilian state of Paraíba. Noronha et al. (17) also found the 21–30 age group to be most commonly affected. Similar findings were reported by Singh et al. (19) and Amin et al. (20).

Out of a total of 550 patients, 194 patients (35.27%) had a tertiary education, 189 (34.36%) had a secondary education, 110 (20%) had a primary education, and 57 (10.36%) had not attended school (were illiterate). Fifty-nine (10.72%) patients earned less

than 5,000 rupees per month, and 333 patients (60.54%) were in the 5,000 to 15,000 rupee monthly income group. Ranganathan et al. (21) reported that 69.2%, 23.3%, and 1.8% of infected people ($n = 462$) were from a low-income group, middle-income group, and high-income group, respectively. Noronha et al. (17) reported that the most commonly affected were the poor (61.3%), followed by the lower middle class and those below the poverty line (17.3% each), and the least in the upper-middle class (4.0%). Factors that might lead to a higher incidence in patients with low socioeconomic status and a low level of education may be related to poor hygiene, overcrowding, use of topical steroids, sharing towels and clothes, and a family history of dermatophytosis, among others.

Recent onset of infection with disease duration less than 6 months was seen in up to 44% of cases ($n = 242/550$) in this study. Nibedita et al. (13) also found that patients with disease less than 6 months formed the largest portion compared to chronic dermatophytosis.

Up to 74.18% of cases in this study had various combinations of tinea cruris, tinea corporis, or tinea faciei. A combination of tinea cruris with tinea faciei predominated in this study. When presented alone, tinea cruris was the most common variant. Previous studies in Italy and Croatia reported a similar prevalence of various types of dermatophytosis (22, 23).

Tinea corporis was the most common individual clinical type in a study by Noronha et al. (17), seen in 24.7% of patients, and also in studies by Bindu et al. (24) and Singh et al. (19). In contrast, Lyngdoh et al. (25) found tinea pedis (26.6%) to be the most common. Sidappa et al. (26) also reported multiple combinations of dermatophytosis in up to 23% of cases. In the study by Noronha et al. (17), multiple site involvement was the most common pattern and was seen in 34% of patients.

Only 5.82% cases were atopic and 3.09% cases were known diabetics. In the study by Noronha et al. (17), 8% of patients had associated diabetes mellitus, and 3.3% of patients had asthma. In the study by Bindu et al. (24), diabetes mellitus and atopy were seen in 10.6% and 10% of cases, respectively.

QOL is defined as an "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns". It is a complex interplay between a wide range of factors, including the individual's physical and mental health, psychosocial wellbeing, and economic and functional independence (27).

In this study, QOL was assessed to determine the burden of dermatophytosis on patients' lifestyle. We found that dermatophytosis affects QOL more adversely particularly in young adults, predominantly female patients, as well as patients with no or a low level of education, low socioeconomic status, widespread tinea, poor hygiene, and a history of steroid abuse, as has also been documented in previous studies. QOL in dermatophytosis patients has recently been described as discussed earlier, but its relation to steroid abuse has not been extensively studied.

Strong correlations between dermatological infections and low socioeconomic conditions, geographical locations, climate, overcrowding, health care, and hygiene have been demonstrated by many researchers (14, 28, 29).

Conclusions

Dermatophytosis is a very common fungal infection in India. Steroid abuse is rampant in the management of dermatophytosis, especially in northern India, as was seen in this study. At a time when newer antifungals are scarce, the menace of steroid abuse in cutaneous fungal infections further hampers the successful treatment of dermatophytosis. Furthermore, the chronic and recalcitrant nature of these infections adversely affect QOL, as found in this study, particularly in young adults and patients with steroid abuse, low socioeconomic status, widespread tinea, and poor hygiene.

The study findings might be applicable to other regions of India, as indicated by similar observation in previous studies (1). There is a need to replicate this study in a community setting to extrapolate the findings to all dermatophytosis patients in the Indian subcontinent.

It is also high time that the government undertook strict implementation of drug dispatching guidelines at all levels. The use of high- and moderate-potency steroids, alone and in combination creams, should be limited. Providing steroids over the counter without a proper prescription should be appropriately regulated, if not completely banned. This study could help raise awareness about the widespread abuse of topical steroids in the general population and its consequences (16).

The limitations of this study include convenience sampling and potential recall bias.

References

- Panda S, Verma S. The menace of dermatophytosis in India: the evidence that we need. *Indian J Dermatol Venereol Leprol.* 2017;83:281-4.
- Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. *Mycoses.* 2008;51:2-15.
- Naglot A, Shrimali DD, Nath BK, Gogoi HK, Veer V, Chander J, et al. Recent trends of dermatophytosis in northeast India (Assam) and interpretation with published studies. *Int J Curr Microbiol App Sci.* 2015;4:111-20.
- Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas CR, Sardana K, et al. Expert consensus on the management of dermatophytosis in India (ECTODERM India). *BMC Dermatol.* 2018;18:6.
- Lacaz CS, Porto E, Heins-Vaccari EM, Melo NT. [Guia para identificação: fungos, actinomicetos, algas de interesse medico]. São Paulo: Sarvier; 1998. Portuguese.
- Singh SM, Narang T, Dogra S, Verma AK, Gupta S, Handa S. Screening for depressive disorders in outpatients with mild to moderate psoriasis: a study from North India. *Indian J Dermatol Venereol Leprol.* 2015;81:148-50.
- Johnson M, Kwatra G, Badyal DK, Thomas EA. Levocetirizine and rupatadine in chronic idiopathic urticaria. *Int J Dermatol.* 2015;54:1199-204.
- Mishra N, Rastogi MK, Gahalaut P, Agrawal S. Dermatology specific quality of life in vitiligo patients and its relation with various variables: a hospital based cross-sectional study. *J Clin Diagn Res.* 2014;8:YC01-03.
- Verma S, Vasani R, Reszke R, Matusiak L, Szepietowski JC. The influence of superficial dermatophytoses epidemic in India on patients' quality of life. *Postepy Dermatol Alergol.* 2021;38:102-5.
- Narang T, Bhattacharjee R, Singh S, Jha K, Mahajan R, Dogra S, et al. Quality of life and psychological morbidity in patients with superficial cutaneous dermatophytosis. *Mycoses.* 2019;62:680-5.
- Mushtaq S, Faizi N, Amin SS, Adil M, Mohtashim M. Impact on quality of life in patients with dermatophytosis. *Australas J Dermatol.* 2021;61:e184-8.
- Somenzi CC, Ribeiro TS, Menezes A. Características particulares da micologia clínica e o diagnóstico laboratorial de micoses superficiais. *NewsLab.* 2006;77:106-18.

13. Patro N, Panda M, Jena AK. The menace of superficial dermatophytosis on the quality of life of patients attending referral hospital in Eastern India: a cross-sectional observational study. *Indian Dermatol Online J.* 2019;10: 262–6.
14. Bhatia VK, Sharma PC. Epidemiological studies on dermatophytosis in human patients in Himachal Pradesh, India. *Springerplus.* 2014;3:134.
15. Baur B, Sarkar J. The pattern of dermatological disorders among patients attending the skin O.P.D of a tertiary care hospital in Kolkata, India. *J Dent Med Sci.* 2013;3:4–9.
16. Chaudhary RG, Rathod SP, Jagati A, Baxi K, Ambasana A, Patel D. Prescription and usage pattern of topical corticosteroids among out-patient attendees with dermatophyte infections and its analysis: a cross-sectional, survey-based study. *Indian Dermatol Online J.* 2019;10:279–83.
17. Noronha TM, Tophakhane RS, Nadiger S. Clinico-microbiological study of dermatophytosis in a tertiary-care hospital in North Karnataka. *Indian Dermatol Online J.* 2016;7:264–71.
18. Araújo Gde M, Araújo ND, Farias RP, Cavalcanti FC, Lima Mdo L, Braz RA. Superficial mycoses in Paraíba: a comparative analysis and bibliographical revision. *An Bras Dermatol.* 2010;85:943–6.
19. Singh S, Beena PM. Profile of dermatophyte infections in Baroda. *Indian J Dermatol Venereol Leprol.* 2003;69:281–3.
20. Amin AG, Shah HS. Dermatophytosis. *Indian J Dermatol.* 1973;19:22–7.
21. Ranganathan S, Menon T, Selvi SG, Kamalam A. Effect of socio-economic status on the prevalence of dermatophytosis in Madras. *Indian J Dermatol Venereol Leprol.* 1995;61:16-8.
22. Vena GA, Chieco P, Posa F, Garofalo A, Bosco A, Cassano N. Epidemiology of dermatophytoses: retrospective analysis from 2005 to 2010 and comparison with previous data from 1975. *New Microbiol.* 2012;35:207–13.
23. Miklić P, Skerlev M, Budimčić D, Lipozencić J. The frequency of superficial mycoses according to agents isolated during a ten-year period (1999–2008) in Zagreb area, Croatia. *Acta Dermatovenerol Croat.* 2010;18:92–8.
24. Bindu V, Pavithran K. Clinico-mycological study of dermatophytosis in Calicut. *Indian J Dermatol Venereol Leprol.* 2002;68:259–61.
25. Lyngdoh CJ, Lyngdoh WV, Choudhury B, Sangma KA, Bora I, Khyriem AB. Clinico-mycological profile of dermatophytosis in Meghalaya. *Int J Med Public Health.* 2013;3:254–6.
26. Siddappa K, Mahipal OA. Dermatophytoses in Davangere. *Indian J Dermatol Venereol Leprol.* 1982;48:254–9.
27. World Health Organization. *The World Health Organization Quality of Life (WHO QOL).* Geneva: WHO; 2012.
28. Chowdhry PN, Gupta SL, Anand N. Diversity of fungi as human pathogen. *Recent Res Sci Technol.* 2013;5:17–20.
29. Accorsi S, Barnabas GA, Farese P, Padovese V, Terranova M, Racalbutto V, et al. Skin disorders and disease profile of poverty: analysis of medical records in Tigray, northern Ethiopia, 2005–2007. *Trans R Soc Trop Med Hyg.* 2009;103:469–75.