

Awareness of Risk Factors for Dermatophytoses and its impact on Quality of Life among adults in Mangalore. A Cross-sectional study

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Abstract: Background: Dermatophytoses has always been the most common cause of superficial fungal infections in India. In recent years dermatologists across the country are facing an onslaught of chronic and recurrent dermatophytosis in volumes never encountered previously. Over the last 3-4 years, the frequency of such cases has increased alarmingly.

Methods: In order to evaluate this drastic change in the epidemic profile of dermatophytosis in India, we aimed to assess the level of awareness of its risk factors among the population, and also since the infection is now more chronic and recalcitrant in its course, we used the Dermatology Quality of Life (DLQI) index to evaluate the morbidity associated with dermatophyte infection.

Results: This study showed a significant impairment of QoL in patients with dermatophytosis with a mean DLQI score of 3.73 ± 0.584 . Students were the most commonly affected with dermatophytosis. Symptoms of itching, embarrassment, and self-consciousness were reported by most patients. There was no gender difference in the QoL scores. Patients with Tinea cruris had the highest effect on quality of life.

Conclusion: An increased awareness about dermatophytosis is warranted so that early identification and effective treatment will help reduce the chronicity of the infection and also limit its spread as well as reduce the topical steroid abuse that this infection so rampantly bears.

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I. Introduction

Superficial fungal infection of the keratinized tissues caused by keratinophilic dermatophytes are referred to as Dermatophytoses. It is observed to be the most common cause of superficial fungal infections worldwide and it commonly presents in the tropics with epidemic proportions in areas having high rates of humidity.¹

In the past few years, measuring quality of life (QoL) has become an important aspect of medical research into skin disorders.² Although skin infection has a lower impact on mortality than other diseases, the morbidity associated with it has a great impact on QoL, with symptoms such as pain, stinging and itchiness leading on to discomfort, stigmatization, loss of self-esteem, and limitations in social activities. One such questionnaire is the Dermatology Life Quality Index (DLQI), developed by Finlay and Khan, it is widely used in research and clinical practice to assess changes in health-related QoL, as it is a sensitive measure.³

Moreover the awareness of risk factors associated with Dermatophytoses is an understudied area. Hence this study aims to explore the level of awareness of risk factors related to Dermatophytoses among adults, and how it affects their QoL. These findings are essential to trigger further development of health education among general practitioners and peripheral health workers.

The current epidemic scenario of dermatophytoses in India and the recalcitrant nature of the lesions,⁴ birthed a need for this study to be conducted to determine the effect it bears on the quality of life of those affected in Mangalore, where the climate is conducive for dermatophyte infection.

II. Material And Methods

A hospital-based, prospective, cross-sectional study was done in the Dermatology and STD outpatient department of our tertiary care teaching hospital from May 2017, after approval by the Institutional Research and Ethical Committee.

A total of 250 patients aged 16 years and above with a clinical diagnosis of dermatophytoses were included in the study, after obtaining informed written consent. Patients suffering from medical disorders or on drugs likely to interfere with assessment of Dermatophytoses were excluded from the study.

A detailed history pertaining to the following parameters like demographic data, presenting illness, duration of the disease, contacts with animals or soil, presence of medical/surgical diseases, family, and treatment history were elicited. A thorough dermatological examination was performed to look for the following: (a) Type of lesion and (b) Site of involvement. Skin scraping specimen was collected by scraping the active edge of the lesions and the material was subjected to direct microscopic examination using 10% Potassium hydroxide to confirm dermatophytic infection.

The QoL was measured using the DLQI questionnaire. DLQI is a validated questionnaire which grades QoL by assessing the following domains: (a) physical symptoms and feelings (questions 1 and 2), (b) daily activities (questions 3 and 4), (c) leisure (questions 5 and 6), (d) work/school (questions 7), (e) personal relationships (questions 8 and 9), and (f) treatment (question 10). Each question is scored as “very much” (score 3), “a lot” (score 2), “a little” (score 1), and “not at all” (score 0), keeping in mind the problems faced the previous week due to the disease. Final DLQI score is the sum of all scores (range 0–30). High scores indicate poor QoL.⁵

DLQI score interpretation is done as follows:

- 0–1 No effect on patient's life.
- 2–5 Small effect on patient's life.
- 6–10 Moderate effect on patient's life.
- 11–20 Very large effect on patient's life.
- 21–30 Extremely large effect on patient's life.

Patients were asked to fill up the DLQI questionnaire without assistance. English version of the DLQI was translated into Malayalam, Hindi and Kannada. Forward and backward translation were done by different translators and validated by two other members.

To assess the patient’s awareness on dermatophytoses, an awareness questionnaire with questions pertaining to its risk factors, spread and treatment were recorded as yes, no or don’t know.

Statistical analysis

The data collected were analysed using IBM SPSS Statistics software version 16. The categorical variables were summarized as proportions and percentages. The continuous variables were summarized as mean and standard deviation.

The comparison of categorical variables between independent groups was done with Chi-square test. Analysis of variance was done with Mann Whitney test to compare DLQI scores with various categorical variables. Value of P < 0.05 was considered significant and P < 0.01 as highly significant.

III. Result

A total of 250 consenting individuals were included in the study with a female to male ratio of 1.3:1. The mean age of the study population was 33.76 years (ranging from 16-78 years). The other demographic details of the study population are as shown in Table

1. Majority of our study population were students followed by housewives.

Table 1:Demographic Data & Predisposing Factors

Demographic Data & Predisposing Factors	No. of cases	Percentage (%)
Age <30 years	121	48.4
>30 years	129	51.6
Sex (M: F)	110:140	44:56
Family history of Ringworm infection	178	71.
History of contact with pets	16	6.4
Occupation: Students	80	32
Housewives	70	28

Table 2: Clinical types and duration of tinea

Clinical types of tinea	No. of cases	Percentage (%)
Tinea corporis	46	18.4
Tinea corporis + cruris	71	28.4
Tinea corporis + faciei	18	7.2
Tinea cruris	102	40.8
Tinea cruris + faciei	4	1.6
Tinea faciei	7	2.8
Tinea mannum + corporis	2	0.8
Duration of the Tinea		
Below 3 months	205	82
More than 3 months	45	18

Table 3: Interpretation of DLQI scores

DLQI interpretation	No. of patients (%)
No effect (0-1)	0 (0.0)
Small effect (2-5)	5 (2.0)
Moderate effect (6-10)	70 (28.0)
Very large effect (11-20)	162 (64.8)
Extremely large effect (20-30)	13 (5.2)
Total	250

All the 250 patients had elevated DLQI scores with very large effect (score 11-20) being the most common (64.8%). Thirteen patients (5.2%) had DLQI scores bearing an extremely large effect on quality of life. Sixty-nine of the 102 cases with tinea cruris had a very large effect on the patient's life. Also, 26 of the 46 patients with tinea corporis had a very large effect on the quality of life.

Table 4: Correlation of Clinical Type of Tinea with DLQI Scores

Clinical type of tinea	Small Effect	Moderate Effect	Very large Effect	Extremely Large effect	Total
Tinea corporis	0	17	26	3	46
Tinea corporis + cruris	1	21	43	6	71
Tinea corporis + faciei	0	1	16	1	18
Tinea cruris	4	27	69	2	102
Tinea cruris + faciei	0	1	3	0	4
Tinea faciei	0	2	5	0	7
Tinea mannum + corporis	0	1	0	1	2
Total	5	70	162	13	250

There was no age specific statistically significant difference in DLQI scores. Among the 140 females, 95 had DLQI scores with a very large effect on the patient's life. One-twenty-seven of the 201 patients who had lesions for less than 3 months had a very large effect on quality of life while 12 had an extremely large effect on the quality of life.

Table 5: Correlation of Age, Sex and Duration of Tinea with DLQI Scores

Factor	Values	Small effect	Moderate effect	Very large effect	Extremely large effect	Total
Age	Below 30	4	33	79	5	121
	Above 30	1	37	83	8	129
	Total	5	70	162	13	250
Sex	Females	3	35	95	7	140
	Males	2	35	67	6	110
	Total	5	70	162	13	250
Duration	Below 3 months	5	57	127	12	201
	Above 3 months	0	13	35	1	49
	Total	5	70	162	13	250

The mean of the total DLQI score in this study was 3.73 ± 0.584 (range 0-30). The mean score for each question is shown in (Figure 1). Question 1 on symptoms and feelings had the highest mean DLQI score in this cohort and question 6 on leisure activities like sports had the lowest score. There was no statistically significant difference in the scores for all the questions between male and female sex as shown in (Figure 2). A great impact on symptoms and feeling was noted in all the age groups. (Figure 3).

Figure 1: Mean DLQI score for each question

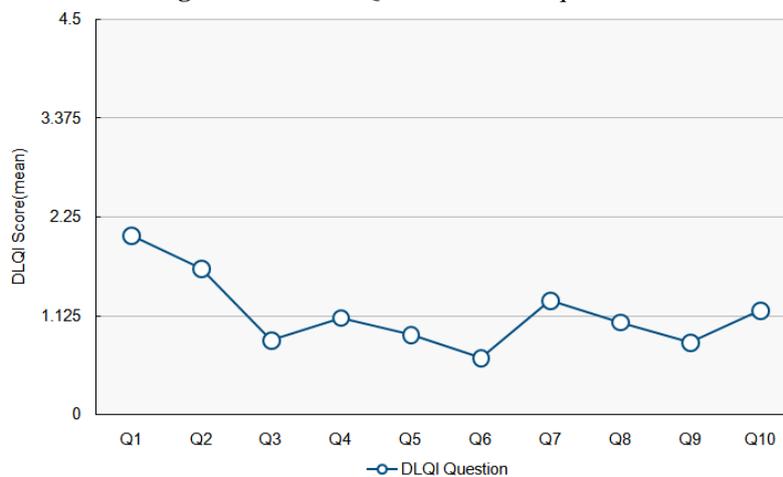
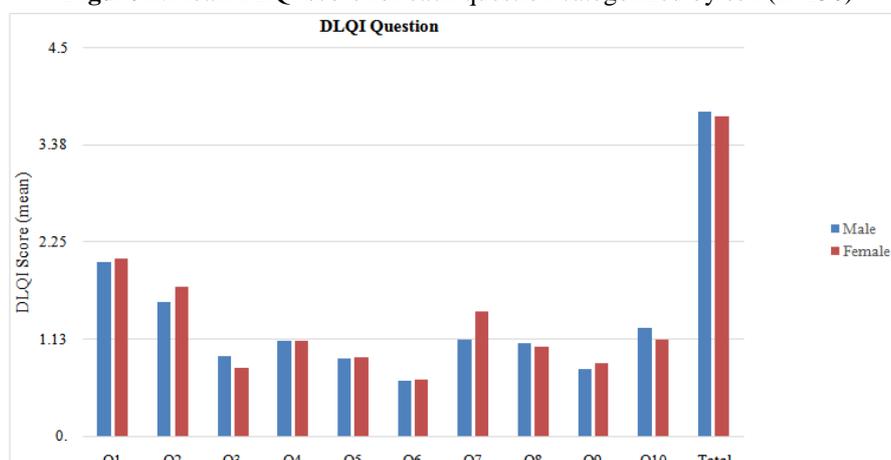
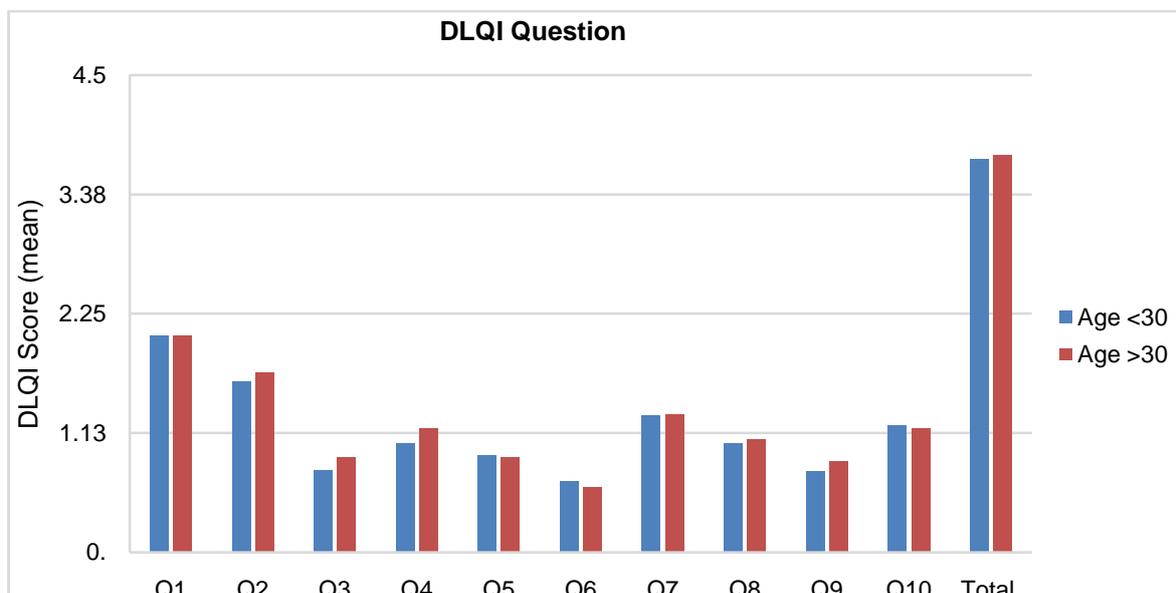


Figure 2: Mean DLQI score for each question categorized by sex (n=250)



Figures 3: Mean DLQI score for each question categorized by age (n=250)



Detailed DLQI questionnaire is as follows.

Table 6: Different aspects associated with quality of life impairment in the Dermatology Life Quality Index (DLQI): Q1-Q10

Items of DLQI	Aspects	Details
Q 1	Symptoms and feeling	Itch, soreness, pain, stinging
Q 2	Symptoms and feeling	Embarrassment and self-consciousness
Q 3	Daily Activities	Shopping and housework
Q 4	Daily Activities	Clothes limitation
Q 5	Leisure	Social and leisure activities
Q 6	Leisure	Sports
Q 7	Work and School	Working and studying
Q 8	Personal relationships	Partner or close friends relationship
Q 9	Personal relationships	Sexual difficulties
Q 10	Treatment	Problems and side effects

Factors influencing Dermatophytoses and QoL

Age –Age of the individuals was not statistically significant with the DLQI scores (P = 0.596) Fishers exact p test.

Sex– Sex of the individuals was not statistically significant with the DLQI scores (P = 0.673) Fishers exact p test.

Occupation - Statistically significant association was seen between occupation and DLQI scores. Spearman r correlation coefficient test was done to find the association between occupation and DLQI. (P = 0.000) Fishers exact p test.

Education - Educational status was assessed with the patient's ability to read and write in their own language. Education and QoL was not significantly associated.

Clinical type of Tinea - No statistically significant association between the DLQI scores and the clinical type of tinea was found (P = 0.930) Fishers exact p test.

Duration of the lesions - No statistically significant association between the DLQI scores and the clinical type of tinea was found (P = 0.252) Fishers exact p test.

Also, no statistically significant co-relation was found between the DLQI scores and the awareness questionnaire.

IV. Discussion

This hospital-based study included 250 cases of cutaneous dermatophyte infections in a period of 4 months. The following clinical forms were observed: tinea corporis, tinea cruris, tinea manuum, tinea barbae, and tinea faciei.

As regards the age incidence, maximum number of cases encountered was in the age group of 21-30 years (29.2%). This was in accordance with the findings of other workers.^[1,6] This was followed by the age group of 31-40 years (26.4%). Dermatophytoses was more common in females (56%) than in males (44%). Similar findings were noticed in a study by Pires et al.⁷ Other studies have reported a higher prevalence in men.^[1,6]

Among the clinical types, tinea cruris was the highest (102 cases) followed by 46 cases of tinea corporis. This was in accordance with the studies by Sardari *et al.*⁸ and Verma *et al.*,⁹ both of whom reported that tinea cruris was the most common clinical type. In a study done by Surendran K et al. tinea corporis was the most common clinical type of dermatophytic infections.^[1]

Among 95 mixed clinical types, tinea corporis et tinea cruris was highest (71 cases, 28.4%). Similar findings have been reported by Peerapur *et al.*¹⁰ In the present study, it was possible to demonstrate fungi on direct microscopy with KOH in 226 cases.

This study demonstrated that most cases were symptomatic with itch of moderate to severe degree. Moreover the clinical appearance and the spreading nature of the lesions, both in individual patients as well as among other members of the family drove the patients to seek medical treatment.

There are no previous studies assessing the QoL in patients with dermatophytoses in literature. This study shows a definite impact of dermatophytoses on the QoL with high DLQI scores affecting the symptoms and feelings with a mean score of 2.04 +/- (S.D 0.861). A statistically significant association was found with the occupation and DLQI with p value of 0.000 by Fishers exact test. Of the 80 students, 65 of them had very large effect of dermatophytoses on their QoL.

Assessment of the awareness questionnaire showed that only 54 patients (21%) were aware that they were suffering with a fungal infection suggesting a need for public awareness about the nature of the infection. More than half of the patients, i.e. 133 (53.2%) of them were aware that sharing of personal belongings could spread the infection as they noticed the lesions in close contacts. Majority (62%) of the patients associated increased perspiration as a risk factor for tinea. Only 46 patients (18.4%) were aware that contacts with infected pets could also lead to the spread of the infection, hence public awareness regarding this risk factor is also warranted. One-seventy-four patients (69.9%) were willing to seek treatment in the form of over the counter medications or medications suggested to others for this infection. An alarming 160(64%) cases also revealed using topical corticosteroid combination creams for the same.

This questionnaire throws light on the attitude of the public to receive treatment for tinea infection. The present recalcitrant nature of the lesions, its epidemic proportions and, the escalating numbers of topical steroid abuse for dermatophytoses in our country, necessitates increased public awareness and education about dermatophytoses.

V. Conclusion

In conclusion this study showed a significant impairment of QoL in patients with dermatophytoses. Students were among the most common affected with dermatophytoses. Symptoms of itching, embarrassment and self-consciousness were reported by most patients. There was no gender difference in the QoL scores. Patients with Tinea cruris had the highest effect on quality of life.

An Increased awareness about dermatophytoses is warranted so that early identification and effective treatment will help reduce the chronicity of the infection and also limit its spread as well as reduce the topical steroid abuse that this infection so rampantly bears.

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