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Influence of dermatophytosis on quality of life: a cross sectional study from Kashmir Valley in North India

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ABSTRACT

Background: Over the past few years, dermatophytosis tends to be prolonged and persistent which negatively affects quality of life and relationship of patients with other people. There is limited literature available on the impact of dermatophytosis on the quality of life (QoL). The aim of the study is to investigate the influence of dermatophytosis on OoL in affected patients and identifying the risk factors associated therein.

Methods: This was a cross-sectional study (descriptive study) in which 425 patients aged ≥18 years with dermatophytosis were included and evaluated for impact on QoL using dermatology life quality index (DLQI) questionnaire. Modified Kuppuswamy scale was also used for assessing the socioeconomic status of the study subjects. Independent t-test and ANOVA were used to find statistical associations between mean DLQI scores and various variables, wherever applicable.

Results: The mean DLQI score in our study was 13.93±6.26. Dermatophytosis was found to have a very large effect on the QoL in majority (55.5%) of our subjects followed by moderate effect in 29.5% cases. Mean DLQI was higher in patients with longer duration of disease, involvement of unexposed sites (groins, gluteal region, axillae), greater number of sites involved, more body surface area involved, pruritus, redness and burning sensation (p<0.05). Regarding socio-demographic related variables, Mean DLQI score was higher in females, rural people, in (20-39) years age group, and in patients belonging to upper middle class (p<0.05).

Conclusions: This study revealed significant impairment of QoL patients with dermatophytosis.

Keywords: Dermatophytosis, Dermatology life quality index, Tinea, Pruritus, Kuppuswamy scale

INTRODUCTION

Dermatophytosis, commonly referred as 'ringworm,' is superficial infection of keratinized tissues caused by organisms belonging to three genera of closely related fungi known as dermatophytes. It is an indisputable fact that an increase in the prevalence of dermatophytosis has been witnessed over the past 4-5 years not only in India but also globally. Comparison of studies done on superficial fungal infections in different cities of the

country during different time frames have revealed an increasing trend of dermatophytosis. ²⁻⁴

India, being a tropical country, has a climate that is conducive for superficial fungal infections. The reported prevalence of dermatophytosis in India ranges from 36.6 to 78.4%.^{5,6} Overcrowding, areas with high humidity, poor hygienic conditions are the main factors which predispose to dermatophytosis. The severity of infection varies from mild to moderate according to host immunity, virulence of the infecting species, site of infection and environmental factors.⁷

It has been observed that over the past few years, dermatophytosis tends to be prolonged and persistent which can be attributed to widespread use of topical steroid creams, erratic use of antifungal agents, changes in the dressing pattern of the host (tight-fitting clothes like figure hugging denims, leggings etc.), change in the etiological agent (increased prevalence of trichophyton mentagrophytes) and emergence of resistance.⁸

Although dermatophytosis is not life-threatening and doesn't lead to functional impairment, it negatively affects quality of life and relationship of patients with other people by leading to shaming, low self-esteem, loss of self-confidence and social timidity. Itching is one of the most intensely perceived symptoms and it is considered as one the main factors affecting quality of life. The increased resistance to antifungals resulting in recalcitrant cases further adds to the burden of morbidity. The multiple aspects of the dermatophytosis are now being studied and discussed on all national and state-level dermatological forums. The aim of this study was to investigate the influence of dermatophytosis on quality of life (QoL) in affected patients and identifying the risk factors associated therein.

Few studies have been carried out in different parts of the country on the impact on quality of life in dermatophytosis, however, there is no study till date which has discussed this aspect in Kashmir valley which experiences a huge climatic variation when compared to rest of the country. The long winter months and less humid summers may have a bearing on fungal recurrence and subsequently on quality of life. Hence, this study aimed to fill these lacunae so that better understanding could be obtained regarding the impact on QoL in dermatophytosis among patients residing in cold and hilly regions of the country.

METHODS

This was a cross-sectional study conducted over a period of one year (September 2018 to 2019) in Department of Dermatology, Venereology and Leprosy, Government Medical College, SMHS Hospital, Srinagar, India. A total of 425 patients aged ≥18 years with clinically diagnosed dermatophytosis, confirmed by positive potassium hydroxide (KOH) microscopy were included in the study. Exclusion criteria included pregnancy, mental illness, liver disease, renal disease and other co-existing dermatological diseases.

A detailed history including age, sex, socio-economic status, site of onset, symptoms (pruritus, redness, burning) and duration of the disease was taken from every patient. The socio-economic status of the study subjects was assessed using modified Kuppuswamy scale - 2019 which is based on consumer price index (CPI) issued by department of labour bureau, government of India.¹⁰

The severity of pruritus was graded on a scale 0-3; with evaluation being as 0- None, 1- mild pruritus, 2- moderate pruritus, 3- severe pruritus.

Assessment of quality of life was done using the dermatology life quality index (DLQI) which is a questionnaire-based survey method to assess, with high degree of reliability, the impact and severity of many dermatology specific diseases and infections. ^{11,12}

The DLQI questionnaire consists of 10 leading questions and each question has answers of 4 options expressed as a scoring pattern from 0-3. The total score for these 10 questions gives the DLQI score which ranges from 0-30. As the score increases, quality of life reduces (Table 1).

Statistical analysis

Data was entered in Microsoft excel and analysed using SPSS version 25.0. Independent t-test and one-way ANOVA were used for finding out statistical association. Quantitative variables were summarized by mean±SD.

RESULTS

A total of 425 patients were included in the study out of which 25 filled the responses to the DLQI questionnaire either irrelevantly or incompletely and therefore were excluded. Out of the remaining 400 patients, 273 (68.25%) were males and 127 (31.75%) were females; mean age was 34.39 ± 13.10 . The largest number of patients were in the age group of 20-39 years comprising 55.5% followed by 40-59 years (25.5%), <20 years (13.0%) and \geq 60 years (6.0%).

The overall mean DLQI score in the present study was 13.93±6.26. As depicted in (Table 1), 55.5% patients had a 'very large' effect on their quality of life due to dermatophytosis while 2.5% patients experienced 'no effect'. Also, the people aged between 20 and 39 years had a higher mean DLQI than other age groups and the difference being statistically significant (Table 2).

Table 1: Patient distribution as per scoring of DLQI.

DLQI score	Inference	N (%)
0-1	No effect on quality of life	10 (2.5)
2-5	Small effect	20 (5.0)
6-10	Moderate effect	118 (29.5)
11-20	Very large effect	222 (55.5)
21-30	Extremely large effect	30 (7.5)

Regarding socio-demographic related variables, mean DLQI score was higher in females than males; and among rural people than urban people and the difference between them was statistically significant (p<0.05) (Table 3).

Table 2: Association of age distribution with DLQI.

Age group (years)	N (%)	DLQI	95% CI	P value
<20	52 (13.0)	8.62±1.34	16.09-21.49	
20-39	222 (55.5)	13.3±2.66	16.41-16.98	P<0.001#
40-59	102 (25.5)	11.26±2.34	7.90-8.45	F=207.4
≥60	24 (6.0)	13.6±3.54	1.64-2.86	

^{*}One-way ANOVA test, CI=confidence interval.

Table 3: Association of socio-demographic related variables with DLQI.

Socio-demographic variable	N (%)	DLQI	95% CI	P value
Gender	•		•	
Male	273 (68.25)	7.06±2.72	9.33-10.80\$	P<0.001*
Female	127 (31.75)	17.12±4.67		T=27.0
Residence				
Urban	150 (37.5)	9.64±2.13	5.34-7.55\$	P<0.001*
Rural	250 (62.5)	13.24±3.21		T=14.83
Socio-economic class (*)	•		•	
Upper middle	114 (28.5)	20.29±4.24	19.50-21.08	- D -0 001#
Lower middle	280 (70.0)	11.46±5.04	10.87-12.06	P<0.001 [#] F=141.6
Upper lower	6 (1.5)	8.0±0.01	7.98-8.01	1'-141.0

^{*}Independent t-test, *One-way ANOVA test, CI=confidence interval, \$CI values are for t-statistic.

Table 4: Association of disease related variables with DLQI.

Clinical characteristic	N (%)	DLQI (mean±SD)	95% CI	Statistical test results
Disease duration	•	•		
≤1 month	20 (5.0)	1.70 ± 0.80	1.32-2.08	
2-6 months	82 (20.5)	7.43±1.07	7.19-7.66	P<0.001#
7-12 months	96 (24.0)	13.90±4.44	13.00-14.80	F=201.91
≥13 months	202 (50.5)	17.7±4.50	17.16-18.43	
No of sites affected				
1	100 (25.0)	6.24±2.5	5.74-6.74	P<0.001#
2	110 (27.5)	11.75±2.80	11.22-12.28	F=603.80
>2	190 (47.5)	19.24±3.55	18.73-19.75	
Site involved				
Exposed sites (face, feet, hands)	110 (27.5)	6.40±2.45	-11.09	
Unexposed sites (gluteal region, groins, axillae)	290 (72.5)	16.78±4.71	9.67\$	P<0.001* T= -28.67
BSA involved			•	
<10%	102 (25.5)	6.27±2.50	5.78-6.77	P<0.001 [#]
10-20 %	112 (28.0)	11.96±2.84	11.43-12.50	F=603.38
>20%	186 (46.5)	19.31±3.56	18.79-19.82	1-005.56
Pruritus				
Yes	338 (84.5)	15.48±5.42	9.06-10.92\$	P<0.001*
No	62 (15.5)	5.48±2.87		T=21.28
Burning sensation				
Yes	270 (67.5)	17.36±4.35	9.88-11.23\$	P<0.001*
No	130 (32.5)	6.80±2.47	·	T=30.85
Redness				
Yes	310 (77.5)	16.22±5.04	9.39-10.94\$	P<0.001*
No **ANON	90 (22.5)	6.04±2.57	DGA 1	T=25.76

^{*}Independent t-test, *One-way ANOVA test, CI=confidence interval, *CI values are for t-statistic, BSA=body surface area.

Table 5: Association of severity of pruritus with DLQI.

Severity of pruritus	N (%)	DLQI (mean±SD)	95% CI	Statistical test results
No pruritus	62 (15.5)	5.87±3.44	4.98-6.76	P<0.001# F=354.2
Mild pruritus	160 (40.0)	10.90±3.30	10.38-11.42	
Moderate pruritus	100 (25.0)	18.00±0.01	17.99-18.01	
Severe pruritus	78 (19.5)	21.32±4.80	20.24-22.40	

^{*}One-way ANOVA test, CI confidence interval.

Participants belonging to upper middle class 114 (28.5%) had a poor mean DLQI score (20.85) followed by lower middle class 280 (70.0%) with a mean DLQI score of 11.46.

Considering clinical characteristics of the disease, mean DLQI was higher in patients with longer duration of disease, involvement of unexposed sites (groins, gluteal region, axillae), greater number of sites involved, more BSA involved, pruritus, redness and burning sensation and the difference between them was statistically significant (p<0.05) (Table 4). Also, as severity of pruritus increased, mean score of DLQI also increased and the association was statistically significant (Table 5).

DISCUSSION

In recent years, QoL has increasingly been regarded as an important component of disease burden and as a relevant aspect of a comprehensive clinical assessment. World Health Organization (WHO) defines quality of life as 'individuals' 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'. 13 Owing to the fact that skin diseases are known to have strong impact on self-consciousness, feelings of unattractiveness, social withdrawal and emotional stress, QoL indicators have found a special status in modern health care provision in dermatology. Considering the morbidity and discomfort associated with recurrent and persistent dermatophytosis, this study provides an insight in understanding the sociodemographic parameters and disease related variables that have a bearing on quality of life in affected patients.

In our study the male: female ratio was 2.15:1. This male preponderance may be to increased outdoor exposure and more physical work which results in more sweating.¹⁴ Less cosmetic consciousness in males may also be a contributing factor responsible for delay in seeking treatment till the condition worsens.

In this study majority of the patients were aged between 20-39 years. This age specific higher prevalence can be explained by the fact that patients in this age group form the productive chunk of the population and are usually exposed to increased physical activity leading to excessive sweating which favours fungal growth.

The overall mean DLQI score in the present study was 13.93±6.26 which is higher than reported in scabies (mean, 10.1±5.9) and in psoriasis (13.0±6.9). ^{15,16} In our study DLQI questionnaire, high mean scores were observed for question 1 (symptoms) followed by question 2 (embarrassment) and question 4 (clothing pattern), with low mean scores for question 6 (sports) and question 8(problems from friends) in the DLQI questionnaire. In a study by Narang et al, the mean total DLQI score was 13.41±7.56 and the main items in the questionnaire influenced by the disease were 'symptoms and feelings,' followed by 'daily activities,' 'leisure' and personal relationships. ¹⁷

A good proportion of patients (55.5%) had a 'very large effect' on their QoL. This was because most of these patients had ≥ 2 sites involved and had disease duration >1 year besides taking irregular treatment because of financial constraints.

Females had a higher mean DLQI score than males in our study; possibly due to greater cosmetic concern among females. Also, it has been reported that pruritus, in general, affects QoL in females more than males because of increased frequency of anxiety and stress levels among women which adversely affects their psychological wellbeing.¹⁸

In our study, disease duration emerges as an important factor affecting DLQI. Longer the mean duration of the disease, higher is the mean DLQI score. It was also observed that mean DLQI score was higher in patients with involvement of unexposed sites (groins, gluteal region) which is in contrast to diseases like acne and psoriasis where higher DLQI is found when exposed sites (face, hands, feet, scalp) are involved. 19-20 This is because the patient usually finds it embarrassing to itch/scratch the gluteal area and the groins, especially in public domain, which adversely affects his/her day-to-day activities.

Rural patients had a higher mean DLQI score than urban one possibly because of financial constraints, inadequate access to medicines and inadvertent use of topical steroids prescribed by local quacks in rural areas.

Participants belonging to upper middle class had a poor DLQI score, the plausible explanation being that people belonging to this socioeconomic class had more subjective feeling of embarrassment and uneasiness following dermatophytosis.

When compared to asymptomatic patients, it was found that mean DLQI score was higher in symptomatic patients with pruritus, burning, redness, greater number of sites affected and more BSA involved; and the difference between them was statistically significant (p<0.05). This was in concordance to the findings of Patro et al, who found statistically significant association with body surface area involvement, demographic variables like gender, level of education and socio-economic status.²¹ Also, it was observed that more severe pruritus had significantly higher mean score of DLQI and therefore pruritus can be considered as an important parameter having an adverse impact on quality of life in patients with dermatophytosis.

Limitations

This study excluded the patients suffering from comorbid conditions which was done to restrict their impact on QoL. Another limitation was that the sample size was taken from a single tertiary care hospital and thus, cannot be generalised. Hence, we recommend that more studies with larger sample size from multiple health care centres/hospitals be carried out to further establish the utility and feasibility of DLQI score-based assessment of QoL in patients with dermatophytosis.

CONCLUSION

Dermatophytosis was found to have a significant impact not only on the physiological aspect of patients but also on their emotional and social well-being. The quality of life in dermatophytosis is affected by female gender, rural residence, involvement of unexposed sites, duration of the disease, and socioeconomic status of the patient. This study highlights the utility and feasibility of DLQI score based QoL in assessing the perception of patients about their health, thus giving a more comprehensive account of the overall impact of the disease.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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