

Quality of life and economic burden in patients with dermatophytosis in a tertiary level hospital of Kathmandu, Nepal



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ABSTRACT

Background: Dermatophytosis is the infection of keratinized tissue (skin, hair, and nail) caused by various species of dermatophytes. Cutaneous lesions and pruritus caused by dermatophytosis are associated with significant morbidity and impairment of quality of life (QoL). **Aims and Objectives:** The aim of the study was to assess impairment in quality of life and economic burden in patients with dermatophytosis in Tertiary Level Hospital of Kathmandu, Nepal. **Materials and Methods:** The following is a hospital-based cross-sectional prospective study conducted in 150 tinea patients in the Department of Dermatology, Tribhuvan University Teaching Hospital from July 2019 to June 2020. Patient aged 18 years and above was assessed with history and examination and then asked to fill the printed validated DLQI questionnaire in Nepali to assess the impairment in quality of life. Average amount of money spent for over-the-counter medication before enrollment in the study was calculated and analyzed. **Results:** Out of 150 tinea patients, 68.6% were males and 31.4% were females. The mean age of patient with tinea was 29.58 + 10.174 and most patients were students (36.6%). The most common diagnosis was tinea cruris (26%) and median duration of illness was 3.5 months. The median DLQI score was nine, indicating "moderate effect on patient's life." The median amount spent in the management before visiting our center was NRs. 1500. **Conclusion:** The study showed that dermatophytic infections are associated with moderate impact in QoL and economic burden.

Key words: Dermatophytosis; Economic burden; Tinea, Quality of life

INTRODUCTION

Dermatophytosis is the infection of keratinized tissue (skin, hair, and nail) caused by various species of dermatophytes that belong to three asexual genera – *Microsporum*, *Trichophyton*, and *Epidermophyton*.^{1,2} Inappropriate use of over the counter (OTC) topical steroid preparation and non-compliance to the medication resulted in the treatment resistant cases.³ The community prevalence of dermatophytosis has been estimated to be around 4.4%.⁴

Skin diseases although not fatal can affect mental, social, and other areas of functioning of patient's as well as their family members.⁵ Although not life-threatening,

dermatophytosis can cause impairment in quality of life. Intractable pruritus due to dermatophytosis is the main factor affecting the quality of life.⁶

Patient suffering from dermatophytosis usually visit dermatologist late after using various topical and systemic medication or once the lesion becomes chronic.⁷ In our part of world, there is easy availability of various topical fixed drug combinations they are grossly abused for months to years. This leads to chronic treatment resistant dermatophytosis.⁸

Economic burden is not just the amount of money spent while pursuing treatment of disease but also the indirect expenses associated with it. Cost of illness studies is

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commonly employed to determine the economic burden of specific diseases in the medical literature.

Chronic dermatophytosis commonly affects poor people living in overcrowded places and they usually have multiple family members affected resulting in economic burden.⁹

Aims and objectives

To assess impairment in quality of life and economic burden in patients with dermatophytosis in tertiary level Hospital of Kathmandu, Nepal.

MATERIALS AND METHODS

The following is a hospital-based cross-sectional prospective study conducted in 150 tinea patients in the Department of Dermatology, Venereology, and Leprology, Maharajgunj Medical Campus, Institute of Medicine, TUTH from July 2019 to June 2020. Patient aged 18 years and above was assessed with history and examination and dermatophytic infections were diagnosed clinically and were defined as presence of round to oval, single or multiple, erythematous, scaly, well-defined plaque with active margins, and with central clearing over different parts of body. The diagnosis was verified by one of the supervisor.

The study variables included were age, gender, duration of disease, site of involvement/regional diagnosis, DLQI, and amount of money spent.

Following consent, validated Nepali translation of DLQI questionnaire was handed out. Relevant history including average amount of money spend by patients for over-the-counter medication before enrollment in this study. The amount spent by the participants was recorded as total cost of various medications purchased by participants to manage their dermatophytosis before enrollment in this study. The data were entered in SPSS version 26 and analyzed for descriptive statistics. The study was conducted after taking ethical approval from the Institutional Review Committee of Institute of Medicine.

RESULTS

Out of 150 tinea patients, 68.6% (n=103) were males and 31.4% (n=41) were females. The mean age of patient with tinea was 29.58+10.174, ranging from 18 to 61 years. The most common diagnosis was tinea cruris (26%), followed by combined tinea cruris and tinea corporis (24%) (Table 1).

Majority of patient 84% (n=126) used OTC steroid combination cream, which was prescribed by pharmacist.

Only 8% (n=12) participant visited us without using OTC medication. The median amount spent for its management before visiting us was NRs. 1500 and amount ranged from minimum of zero to maximum of NRs. 30,000 (Table 2).

The median DLQI score for dermatophytosis was 9 thus indicating “moderate effect on patient’s life.” DLQI score was highest in the age group 20–40 years with median score of 9.5 and was least in the age group more than 40 years with median score of 8. DLQI score was higher in male participants with median score of 9 compared to the female participants with median score of 8. DLQI score was highest in the patients with the regional diagnosis of combined tinea cruris and tinea faciei with the median DLQI score of 15.5 and was lowest in the patient with regional diagnosis of onychomycosis with the median DLQI score of 3. DLQI score was highest in participants spending amount ranging from 3001 to 6000 with median DLQI of 13 thus indicating very large effect in quality of life. DLQI score was least among participants who did not spent money for its management, with median DLQI of 4 (Table 3).

Table 1: Demographic details and diagnosis of cases (n=150)

Variables	Number of patient (%) n=150
Age (years)	
<20	23 (15.4%)
20–40	108 (72%)
>40	19 (12.6%)
Sex	
Male	103 (68.6%)
Female	47 (31.4%)
Regional diagnosis	
Tinea corporis + Tinea faciei	6 (4%)
Tinea cruris + Tinea faciei	4 (2.7%)
Tinea faciei	10 (6.7%)
Tinea cruris + Tinea corporis+Tinea faciei	5 (3.3%)
Tinea mannum	1 (0.7%)
Tinea cruris + Tinea corporis	37 (24.6%)
Tinea corporis	36 (24%)
Tinea cruris	39 (26%)
Tinea pedis	8 (5.3%)
Tinea corporis + Onychomycosis	1 (0.7%)
Onychomycosis	3 (2%)

Table 2: Amount of money spent

Amount in rupees	Number of patient
None	12 (8%)
1–3000	92 (61.3%)
3001–6000	27 (18%)
>6000	19 (12.7%)

Table 3: Median DLQI scoring according to the variables

Variables	Median DLQI	IQR	P-value
Age (years)			0.827
<0	9	5	
20–40	9.5	9	
>40	8	9	
Sex			0.889
Male	9	9	
Female	8	7	
Regional diagnosis			0.058
Tinea corporis + Tinea faciei	13	12	
Tinea cruris + Tinea faciei	15.5	9	
Tinea faciei	11.5	8	
Tinea cruris + Tinea corporis + Tinea faciei	11	9	
Tinea mannum	11	-	
Tinea cruris + Tinea corporis	9	9	
Tinea corporis	8.5	9	
Tinea cruris	7	7	
Tinea pedis	7	6	
Tinea corporis + Onychomycosis	7	-	
Onychomycosis	3	-	
Amount of money spent			<0.001
None	4	6.75	
1–3000	7	7	
3001–6000	13	10.5	
>6001	12	13	

DISCUSSION

Various different manifestations of dermatophytosis were seen in the participants of the study with significant impact on the quality of life of the patient along with an added economic burden. A total of 150 participants were enrolled in our study out of which 103 (68.6%) were male and 47 (31.4%) were female. The ratio of male to female was 2.19:1, as evidenced by several other studies too,^{10,11} in which, there were 119 males (55.6%) and 95 females (44.4%) and 189 males (71.86%) and 74 females (28.14%), respectively. The number of male participants was found to be higher in all of the studies.

In our study, the mean age was found to be 29.58 years (SD±10.174 years). It was similar to the mean age of presentation of 33.76 years in a study by Joanne and Kamath.¹² The mean age was 45.6 years (SD±16.42 years) in a study of Biçer et al.,¹¹ which was higher than in our study. The lower age of presentation in our study could be accounted due to the fact that young patients could be more concerned about the disease condition and have health care seeking behavior.

The most common regional diagnoses in our study was tinea cruris, tinea corporis, and a combination of tinea cruris and corporis which amounted for 39 (26%), 36 (24%), and 37 (24.6%) cases, respectively, whereas the

remaining dermatophytosis accounted for only 25.4% of all cases, which is in accordance with findings of other studies too.^{12,13} The higher occurrence of tinea cruris and tinea corporis reflects the higher prevalence of the above two dermatophytosis¹⁴ and could be due to the increased occurrence of heat and humidity in the covered areas of the body.

Impact on the quality of life was assessed using the DLQI score. The median DLQI score obtained was 9. Similar findings were found in several studies.^{10,11} Thus, we can see a significant impact on quality of life on the participants due to dermatophytosis.

The highest median DLQI score was seen in the participants of age group of 20–40 years which was 9.5 and the lowest in age group of >40 years which was 8. The result in this study is similar to that by Patro et al.,¹⁵ where mean DLQI score was high among age group of 18–40 years. However, result is different in study by Varshney et al.,¹⁰ where the highest DLQI score was seen in patients of age group 41–60 years. The difference in DLQI in different population could be due to difference in socio-economic status of the population.

The median DLQI score was higher in male patients which was 9 and was lower in female patients which was 8. Somewhat similar findings have been highlighted in some other studies too.^{10,15} Thus, males have higher impairment in the quality of life (QoL), this may be due to the high physical activity and exposure to people and environment among males.

The highest median DLQI score was seen in the participants with diagnosis of combined tinea cruris and tinea faciei which was 15.5 and the lowest in participants with diagnosis of onychomycosis which was 3. Similar results were seen in several other studies.^{8,10} Thus, in patients with multiple site involvement and involvement of visible body parts has higher impairment in quality of life. This is because it is embarrassing to itch/scratch the gluteal area and the groins, especially in public domain, which adversely affects his/her day-to-day activities and involvement of visible body parts is associated with shame, which affects the quality of life.

In this study, the majority of participants 84% (n=126) used various steroid containing OTC topical medication. Only 8% (n=12) participants visited us without using any OTC medication. Similar findings were seen in the study by Doshi et al.,¹⁶ and Dabas et al.¹⁷ Thus, peoples in our part of world are less aware about the importance of appropriate use of medication and there is no

appropriate policy and laws for dispensing medications by pharmacist.

There are no previous studies assessing economic burden in patients with dermatophytosis in the literature. According to the government survey 2018/2019, the per capita income (PCI) of Nepalese population is \$1071.1/year and 18.5% of Nepalese population are below poverty line.¹⁸ In this study, median amount (only direct cost of therapy) spent for the management of tinea before visiting to our center with various topical and systemic preparation was NRs. 1500 (\$17.85) and maximum spent was NRs. 30,000 (\$357). In comparison to PCI of Nepalese population expenditure of such amount in use of inappropriate medication without improvement of disease condition is contributing a significant economic burden and considering also the other indirect cost related to this disease, it is expected to cause profound economic burden to the individual, family, and to the nation.

Limitations of the study

This study, being a hospital-based retrospective study, may not directly reflect the actual scenario in general population. There is a recall bias related to money spent for OTC preparation, so amount represented in the study may not be accurate. The indirect cost related to dermatophytosis could not be evaluated.

CONCLUSION

Dermatophytosis is a common disorder presenting in dermatology OPD. Although not life-threatening, it has significant impact on patients QoL. These results highlight the need for appropriate patient care and provide appropriate information about the disease, its prognosis, and prevention measures. People in our part of world are less aware about importance of use of appropriate medication and are using inappropriate medication for months to year resulting in an economic burden.

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REFERENCES

- Craddock LN and Schieke SM. Fungal diseases. In: Kang S, Amagai M, Bruckner AL, Enk AH, Margolis DJ, McMichael AJ, et al., editors. *Fitzpatrick's Dermatology*. 9th ed. New York: McGraw-Hill Education; 2019. p. 2925-2951.
- Hay RJ, Ashbee HR. Fungal infections. In: Griffiths CE, Barker J, Bleiker T, Chalmers R and Creamer D, editors. *Rook's Textbook of Dermatology*. 9th ed. West Sussex: Wiley Blackwell; 2016. p. 32.2-32.96.
- Verma S and Madhu R. The great Indian epidemic of superficial dermatophytosis: An appraisal. *Indian J Dermatol*. 2017;62(3):227-236.
https://doi.org/10.4103/ijd.IJD_206_17
- Shrestha R, Shrestha D, Lama L, Gurung D and Rosdahl I. Pattern of skin diseases in a rural village development community of Nepal. *Nepal J Dermatol Venereol Leprol*. 2016;12(1):41-44.
- Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, et al. The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. *J Invest Dermatol*. 2014;134(6):1527-1534.
<https://doi.org/10.1038/jid.2013.446>
- Dogra S and Narang T. Emerging atypical and unusual presentations of dermatophytosis in India. *Clin Dermatol Rev*. 2017;1(3):12.
- Dutta B, Rasul ES, Boro B. Clinico-epidemiological study of tinea incognito with microbiological correlation. *Indian J Dermatol Venereol Leprol*. 2017;83(3):326-231.
https://doi.org/10.4103/ijdv.IJDVL_297_16
- Verma SB. Sales, status, prescriptions and regulatory problems with topical steroids in India. *Indian J Dermatol Venereol Leprol*. 2014;80(3):201-203.
<https://doi.org/10.4103/0378-6323.132246>
- Bishnoi A, Vinay K and Dogra S. Emergence of recalcitrant dermatophytosis in India. *Lancet Infect Dis*. 2018;18(3):250-251.
[https://doi.org/10.1016/S1473-3099\(18\)30079-3](https://doi.org/10.1016/S1473-3099(18)30079-3)
- Varshney AP, Gahalaut P, Pardal PK, Mishra N and Rastogi MK. Quality of life in patients with chronic dermatophytosis. *Nepal J Dermatol Venereol Leprol*. 2020;18(1):44-51.
- Biçer S, Ulaş Y, Atasoy M, Özyurt K, Ulaş S, Ertaş R, et al. Impact of pruritus on quality of life in patients with tinea. *Int Phys Med Rehabil J*. 2018;3(6):534-538.
- Joanne DS and Kamath HG. Awareness of risk factors for skin infections and its impact on quality of life among adults in a Malaysian city: A cross-sectional study. *IOSR J Dent Med Sci*. 2018;17(6):64-70.
- Patro N, Panda M and 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(3):262-266.
https://doi.org/10.4103/idoj.IDOJ_342_18
- Khadka S, Sherchand JB, Pokharel DB, Pokhrel BM, Mishra SK, Dhital S, et al. Clinicomycological characterization of superficial mycoses from a Tertiary Care Hospital in Nepal. *Dermatol Res*

- Pract. 2016;2016:9509705.
<https://doi.org/10.1155/2016/9509705>
15. Rajashekar TS, Nandigonnannavar S, Kuppuswamy SK and Madhavi GS. Dermatology life quality index in patients with persisting and recurrent dermatophytoses. *Int J Res Dermatol.* 2019;5(1):139.
 16. Doshi B, Sajjan V, Manjunathswamy B and Bindagi A. Cross-sectional study on assessing quality of life of patients diagnosed with superficial dermatophytosis in South-West India. *Indian J Health Sci Biomed Res.* 2020;13(2):160.
 17. Dabas R, Janney M, Subramaniyan R, Arora S, Lal VS and Donaparthi N. Use of over-the-counter topical medications in dermatophytosis: A cross-sectional, single-center, pilot study from a tertiary care hospital. *Indian J Drugs Dermatol.* 2018;4(1):13.
https://doi.org/10.4103/ijdd.ijdd_5_18
 18. Government of Nepal. Ministry of Finance. Economic Survey 2018/2019. Kathmandu: Government of Nepal; 2019.

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SK- Idea and design of the study, literature review, data analysis, and manuscript preparation; **DBP-** Coordination, interpretation, correction, and revision of the manuscript; **SP-** Coordination, interpretation, correction, and revision of the manuscript

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