

**ASSESSING THE PERCEPTION OF UNDERSTANDING OF CAUSATION,  
PREVENTION, CARE SEEKING BEHAVIOUR AND PERSONAL HYGIENE IN THE  
SUBJECTS HAVING RECALCITRANT DERMATOPHYTOSIS**

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**ABSTRACT**

**Background:** Recently, recalcitrant dermatophytosis has been a major concern among subjects. The perception of patients or hosts concerning recalcitrant dermatophytosis depicts the real assessment of host factors rooted deep and the ways to overcome the cultural and socio-economic milieu that hinders the prevention of recurrence and relapse of the infection.

**Aims:** The present study aimed to assess the perception of understanding of causation, prevention, care seeking behaviour and personal hygiene in the subjects having recalcitrant dermatophytosis.

**Methods:** Two groups having 24 subjects with recalcitrant dermatophytosis were assessed using a predetermined FGD (Focus Group Discussion) guide. Both sessions of FGD were recorded and transcribed. The verbatims were analyzed thematically and themes emerging were assessed using illustrative quotations. The data gathered were analyzed.

**Results:** Disease is prevented with clothes drying and clothes washing with soap antiseptics. Disease spread with bathing in ponds using mustard oil and not changing undergarments for a long time. Also, the most common perception is household jobs causing tinea, outdoor playing, working in the sun for >5 hours, and staying in wet clothes. Five themes emerged after data pile sorting including care seeking behavior, the role of personal and traditional beliefs, prevention, understanding of the predisposing factors of the disease, and ignorance about the disease.

**Conclusion:** It is needed critically to address the traditional beliefs and myths not having background scientific evidence. Expenses on dermatophytosis treatment warrant controlling the cost of antifungals prescribed commonly. Professional responsibilities and poor socio-economic status hinder the population from the implementation of preventive measures.

**Keywords:** Care seeking behavior, focus group discussion, recalcitrant dermatophytosis, traditional beliefs

## INTRODUCTION

Commensal yeast, non-dermatophytic molds, and dermatophytes cause superficial fungal infections known as dermatophytosis. Dermatophytosis is a superficial fungal infection having an affinity for the structures rich in keratin including nails, hairs, and skin. Recalcitrant tinea infection is a term that may depict chronic infection, persistent infection, reinfection, recurrent infection, and relapse.<sup>1</sup> Recalcitrant dermatophytosis recently has shown a high increase in prevalence owing to unresponsiveness for topical and oral antifungal drugs available and has emerged as a major threat concerning the achievement of a complete cure for the disease. It is vital to assess the factors responsible for significant distress to affected subjects financially, emotionally, and socially. In Indian dermatologists, recalcitrant dermatophytosis is emerging as a great challenge.<sup>2</sup>

The literature evidence is lacking that elucidates the actual reason for the recalcitrant dermatophytosis outbreak. The host susceptibility for dermatophytosis has been established well for atopic, immune-suppressed, and diabetic subjects along with subjects on systemic corticosteroid therapy which is considered as threatening. Recently, topical corticosteroid use has also been considered a risk factor for recalcitrant dermatophytosis.<sup>3</sup> Previous literature data have assessed changes in the clinical profile and disease recurrence concerning corticosteroid abuse for tinea. Various data depict the not needed use of OTC (over-the-counter) drugs. Using rational therapy is vital today concerning topical steroid misuse and antimicrobial resistance. The unresponsive nature of dermatophytosis infection is a prevalent health concern in India.<sup>4</sup>

Previous literature data also depicts the need for exploration of change in the patterns of the causative agent and resistance of fungal agents for the existing antifungal agents. A paradigm shift is seen in the etiologic factors with *Trichophyton rubrum* not considered as the primary etiologic agent and is replaced by *T. mentagrophytes*. Increases in MIC (minimum inhibitory concentration) values are usually seen related to griseofulvin, terbinafine, and fluconazole. However, it has been concluded that recalcitrant dermatophytosis cannot be explained using the high MIC alone. Hence, the need for assessing various factors is being highlighted including therapy compliance.<sup>5</sup>

The subject's or host's perception concerning the disease provides a real-life assessment of the depth of the rooted host factors that could provide an idea for overcoming the cultural and socio-economic milieu hindering the prevention of recurrence and relapse.<sup>6</sup> Hence, the present qualitative study was done to assess the perception of understanding of causation, prevention, care seeking behaviour and personal hygiene in the subjects having recalcitrant dermatophytosis. The present study also aimed to assess the cultural and socio-economic milieu that can contribute to the menace of recalcitrant dermatophytosis.

## MATERIALS AND METHODS

The study was done at the tertiary centre from January 2023 to May 2023 after the clearance was taken from the concerned Institutional Ethical committee. The study assessed subjects from the Department of Dermatology, Venereology and Leprosy of the Institute. Written and verbal

informed consent was taken from all the subjects before study participation. The confidentiality and anonymity of all the participants was assured.

For the present study, the inclusion criteria were subjects with cutaneous dermatophytosis having recurrent infection within 6 weeks of preventing adequate antifungal treatment with a minimum of two episodes in the past 6 months were considered having recalcitrant dermatophytosis. The exclusion criteria were subjects who were not willing to participate in the study and subjects who did not sign the informed consent. Hence, among 40 subjects with recalcitrant dermatophytosis, only 24 subjects were finally recruited.

After final inclusion, the background characteristics of all the subjects were assessed using a semi-structured proforma. Two FGD (Focus group discussion) having 24 subjects meeting the inclusion criteria were assessed to assess the disease perception. One group included 12 male subjects and another included 12 female subjects assessed using a predetermined FGD guide having some guiding questions. A moderator was present during the discussion and a recorder was present to record the proceedings. The discussion was done at the Department of Dermatology of the Institute. The participants sat in a semi-circle so that all were visible to each other.

A preformed and tested logical sequence of open-ended questions was done to attain discussion in the study subjects to get an understanding of their perception of the disease, preventive measures adopted by them, the behavior of seeking the treatment, or if they maintain personal hygiene. Subjects were neutrally given questions and the responses were attentively heard and the follow-up questions were asked, if considered necessary. No leading question was there and subjects were not shown about disapproval or approval of the responses. The complete FGD proceedings including the sociogram and level of participation were made and an equal level of participation among responders was revealed. All the sessions were recorded electronically and all sessions did not last for more than 30 minutes.

Following each FGD, data collection and analysis were done. Data including audio recordings and notes were translated into the language understood by the participants, and the data gathered were then translated into English. Interview transcripts were then separately coded by all the researchers and any discrepancy was then sorted with mutual discussion. The coded notes were thematically analyzed and the themes emerging were identified with illustrative quotations.

This was followed by pile sorting and free listing with Smith's salience value. In pile sorting, based on harmonization, individual researchers clubbed the perceptions. The data gathered were analyzed using SPSS software version 21.0.

## **RESULTS**

The present qualitative study was done to assess the perception of understanding of causation, prevention, care seeking behaviour and personal hygiene in the subjects having recalcitrant dermatophytosis. The present study also aimed to assess the cultural and socio-economic milieu that can contribute to the menace of recalcitrant dermatophytosis. The study included 24 subjects in the study having 12 male and 12 female subjects. The mean age of the male subjects was  $36.8 \pm 11.41$  years and female subjects were  $33.8 \pm 11.48$  years. Among the study subjects, 14 subjects were residing in urban areas and 10 subjects were from a rural background. Eight

subjects were illiterate and 16 subjects were literate. In 24 study subjects, 4 subjects had tinea corporis and mannum, 2 subjects had only tinea corporis, and 18 subjects had tinea cruris and corporis both (Table 1). Five themes emerged after data pile sorting including care-seeking behavior, the role of personal and traditional belief, prevention, understanding of the predisposing factors of the disease, and ignorance about the disease.

In care-seeking behavior, few study subjects had treatment in government institutes and the main reason for seeking care in the government institute was the availability of free treatment. Two responders had a belief that ointment from the local medical shop can help in curing the disease. The other two consulted a local quack for disease treatment. Initially and subsequently, the majority of the subjects visited the local quacks, which then referred them to the tertiary care center. The main reason for not visiting the dermatologists was the cost of consultation and medicine. Four study subjects were frustrated with the recalcitrant disease nature despite spending a large amount on disease management.

Concerning the understanding of the predisposing factors of the disease, various factors were considered as disease causes where few subjects considered applying oil and taking a bath in a pond will cure dermatophytosis. The subjects agreed that not changing undergarments for prolonged periods and staying in wet clothing had a vital role in the propagation and predisposition of the disease. Also, it was strongly believed that household working in synthetic garments and sweating predispose and propagate the disease. Disease transmission from a spouse from conjugal life was considered a predisposing disease factor. The female contracting disease in pregnancy did not risk taking medication for the child's health, which led to disease spread and unresponsiveness to the disease. Diabetes was also considered as playing a major role in predisposing people to disease and making them unresponsive to treatment for tinea.

Ignorance about the disease was another theme having a vital role in disease progression. Sharing of common towels, toiletries, and soaps by the majority of the study subjects was seen and was not considered as a reason for the spread of dermatophytosis. Along with ignorance, the sharing was attributed to poor economic conditions. Soap sharing was attributed to the non-possibility of buying individual soaps for all family members. Also, some subjects considered that diseases arise from treating concurrent illnesses like leprosy. Few subjects considered the disease to be caused and recur by drugs used for heartburn and acidity.

A vital role was played by the socio-cultural and traditional beliefs for disease progression. One such belief was earthen smear using cow dung for disease prevention. No participant considered the role of wearing water or sweat-soaked sacred threads or amulets to cause disease occurrence and progression. The amulet was considered for protection from ill fate. Bathing with neem leaves was also considered a protective measure from the disease.

Concerning the role of personal hygiene and prevention, the majority of the study subjects considered cleaning floors with an antiseptic solution having chlorhexidine and cetrimide can help to get rid of persistent dermatophytosis. They focused on changing the sweat-soaked clothes twice a day followed by cleaning with an antiseptic solution or soap that can help in preventing the disease recurrence. It was strongly believed that recurrence can be prevented with the use of sun-dried clothing and taking repeated and regular baths. The use of shared clothing among

siblings owing to financial constraints can help in disease transmission to the family members. Using of cloth pads was highlighted by study females due to lack of money to buy sanitary pads.

## DISCUSSION

The present study included 24 subjects in the study having 12 male and 12 female subjects. The mean age of the male subjects was  $36.8 \pm 11.41$  years and female subjects were  $33.8 \pm 11.48$  years. Among the study subjects, 14 subjects were residing in urban areas and 10 subjects were from a rural background. Eight subjects were illiterate and 16 subjects were literate. In 24 study subjects, 4 subjects had tinea corporis and mannum, 2 subjects had only tinea corporis, and 18 subjects had tinea cruris and corporis both. Five themes emerged after data pile sorting including care-seeking behavior, the role of personal and traditional beliefs, prevention, understanding of the predisposing factors of the disease, and ignorance about the disease. These findings conformed to the studies by Dogra S<sup>7</sup> in 2016 and Rajagopalan M et al<sup>8</sup> in 2018 where authors assessed subjects with demographic data comparable to the present study.

It was seen that for the care-seeking behavior, few study subjects had treatment in government institutes and the main reason for seeking care in the government institute was the availability of free treatment. Two responders had a belief that ointment from the local medical shop can help in curing the disease. The other two consulted a local quack for disease treatment. Initially and subsequently, the majority of the subjects visited the local quacks, which then referred them to the tertiary care center. The main reason for not visiting the dermatologists was the cost of consultation and medicine. Four study subjects were frustrated with the recalcitrant disease nature despite spending a large amount on disease management. These findings were consistent with the previous studies by Sil A et al<sup>9</sup> in 2012 and Patel NH et al<sup>10</sup> in 2020 where similar care-seeking behavior was noted in study subjects with tinea as in the present study.

The study results showed that concerning the understanding of the predisposing factors of the disease, various factors were considered as the disease causes where few subjects considered applying oil and taking a bath in a pond will cure dermatophytosis. The subjects agreed that not changing undergarments for prolonged periods and staying in wet clothing had a vital role in the propagation and predisposition of the disease. Also, it was strongly believed that household working in synthetic garments and sweating predispose and propagate the disease. Disease transmission from a spouse from conjugal life was considered a predisposing disease factor. The female contracting disease in pregnancy did not risk taking medication for the child's health, which led to disease spread and unresponsiveness to the disease. Diabetes was also considered as playing a major role in predisposing people to disease and making them unresponsive to treatment for tinea. These results were in agreement with the studies of Verma S<sup>11</sup> in 2017 and Singh S et al<sup>12</sup> in 2019 where an understanding of the predisposing factors of the disease similar to the present study was reported by the authors in their respective studies.

It was seen that ignorance about the disease was another theme having a vital role in disease progression. Sharing of common towels, toiletries, and soaps by the majority of the study subjects was seen and was not considered as a reason for the spread of dermatophytosis. Along with ignorance, the sharing was attributed to poor economic conditions. Soap sharing was attributed to the non-possibility of buying individual soaps for all family members. Also, some

subjects considered that diseases arise from treating concurrent illnesses like leprosy. Few subjects considered the disease to be caused and recur by drugs used for heartburn and acidity. These findings were in line with the findings of Leung Ak et al<sup>13</sup> in 2020 and Chen L<sup>14</sup> in 2010 where ignorance factors for tinea similar to the present study were reported by the authors.

It was noted that a vital role was played by the socio-cultural and traditional beliefs in disease progression. One such belief was earthen smear using cow dung for disease prevention. No participant considered the role of wearing water or sweat-soaked sacred threads or amulets to cause disease occurrence and progression. The amulet was considered for protection from ill fate. Bathing with neem leaves was also considered a protective measure from the disease. These beliefs were also mentioned by Verma S et al<sup>15</sup> in 2020 and Rengasamy M et al<sup>16</sup> in 2020 where similar beliefs related to dermatophytosis were reported by the authors.

For the role of personal hygiene and prevention, the majority of the study subjects considered cleaning floors with an antiseptic solution having chlorhexidine and cetrimide can help to get rid of persistent dermatophytosis. They focused on changing the sweat-soaked clothes twice a day followed by cleaning with an antiseptic solution or soap that can help in preventing the disease recurrence. It was strongly believed that recurrence can be prevented with the use of sun-dried clothing and taking repeated and regular baths. The use of shared clothing among siblings owing to financial constraints can help in disease transmission to the family members. Using of cloth pads was highlighted by study females due to lack of money to buy sanitary pads. These results were in agreement with Panda S<sup>17</sup> in 2017 and Pathania S et al<sup>18</sup> in 2018 where authors suggested a vital role of personal hygiene in the prevention of tinea.

## **CONCLUSION**

Considering its limitations, the present study concludes that it is needed critically to address the traditional beliefs and myths not having background scientific evidence. Expenses on dermatophytosis treatment warrant controlling the cost of antifungals prescribed commonly. Professional responsibilities and poor socio-economic status hinder the population from the implementation of preventive measures.

## **REFERENCES**

1. Gupta CM, Tripathi K, Tiwari S, Rathore Y, Nema S, Dhanvijay AG. Current trends of clinico mycological profile of dermatophytosis in Central India. *IOSR J Dent Med Sci* 2014;13:23–6.
2. Darouiche RO, Mansouri MD, Kojic EM. Antifungal activity of antimicrobial - impregnated devices. *Clin Microbiol Infect* 2006;12:397-9.
3. Dube S, Tripathi S. Toxicity of some plants against dermatophytes. National Academy of Sciences, India. *Sci Lett* 1987;10:45-8.
4. Mejía Garibay B, Palou E, López Malo A. Composition, diffusion, and antifungal activity of black mustard (*Brassica nigra*) essential oil when applied by direct addition or vapor phase contact. *J Food Prot* 2015;78:843-8.
5. Dogra S. Treatment of dermatophytosis in elderly, children, and pregnant women. *Indian Dermatol Online J* 2017;8:310-8.

6. Sentamilselvi G, Kamalam A, Ajithadas K, Janaki C, Thambiah AS. The scenario of chronic dermatophytosis: An Indian study. *Mycopathologia* 1997-1998;140:129–35.
7. Dogra S, Uprety S. The menace of chronic and recurrent dermatophytosis in India: Is the problem deeper than we perceive? *Indian Dermatol Online J* 2016;7:73-6.
8. 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.
9. Sil A, Das NK, Ghosh P, Datta PK, Islam CN, Tripathi SK. A study to evaluate the price control of antifungal medicines and their practical applicability. *Indian J Pharmacol* 2012;44:704-9.
10. Patel NH, Padhiyar JK, Patel AP, Chhebber AS, Patel BR, Patel TD. The psychosocial and financial impact of disease among patients of dermatophytosis, a questionnaire based observational study. *Indian Dermatol Online J* 2020;11:373-7.
11. Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: An appraisal. *Indian J Dermatol* 2017;62:227-36.
12. Singh S, Verma P, Chandra U, Tiwary NK. Risk factors for chronic and chronic -relapsing tinea corporis, tinea cruris and tinea faciei: Results of a case–control study. *Indian J Dermatol Venereol Leprol* 2019;85:197-200.
13. Leung AK, Lam JM, Leong KF, Hon KL. Tinea corporis: An updated review. *Drugs Context* 2020;9:2020-5-6.
14. Chen L, Chen W. Isolation and characterization of a novel small antifungal peptide from *Bacillus megaterium* D4 Isolated from the dung of wild plateau yak in China. *Protein Pept Lett* 2010;17:542-6.
15. Verma S, Vasani R, Gupta S. Involvement of little discussed anatomical locations in superficial dermatophytosis sundry observations and musings. *Indian Dermatol Online J* 2020;11:419-24.
16. Rengasamy M, Shenoy MM, Dogra S, Asokan N, Khurana A, Poojary S, *et al.* Indian Association of Dermatologists, Venereologists, and Leprologists (IADV) task force against recalcitrant tinea (ITART) consensus on the management of glabrous tinea (INTACT). *Indian Dermatol Online J* 2020;11:502–19.
17. Panda S, Verma S. The menace of dermatophytosis in India: The evidence that we need. *Indian J Dermatol Venereol Leprol* 2017;83:281-4.
18. Pathania S, Rudramurthy SM, Narang T, Saikia UN, Dogra S. A prospective study of the epidemiological and clinical patterns of recurrent dermatophytosis at a tertiary care hospital in India. *Indian J Dermatol Venereol Leprol* 2018;84:678-84.

## TABLES

Characteristics	Subgroup	Number (n)	Percentage (%)
Mean age (years)	Males	36.8±11.41	
	Females	33.8±11.48	
Gender	Males	12	50

	Females	12	50
<b>Residence</b>	Rural	10	41.66
	Urban	14	58.33
<b>Education</b>	Literate	16	66.6
	Illiterate	8	33.3
<b>Dermatophytosis type</b>	Tinea corporis and manuum	4	16.6
	Only tinea corporis	2	8.33
	Tinea cruris and corporis	18	75

**Table 1: background characteristics of the study subjects with dermatophytosis**

S. No	Parameter	Smith's salience score
1.	Treatment interrupted due to pregnancy	0.028
2.	Not bathing regularly predisposes to tinea	0.036
3.	Frustration by disease recurrence despite financial burden	0.088
4.	Government hospital visit as treatment was free	0.097
5.	Treatment by a dermatologist is costly with expensive medicine	0.103
6.	Change clothes only when wet	0.107
7.	Change clothes twice for disease prevention	0.118
8.	Depends on OTC owing to limited resources	0.129
9.	Share clothes due to limited resources	0.132
10.	Consulted quacks	0.159
11.	Diabetes cause dermatophytosis	0.194
12.	No effect of sharing towels, toiletries, or soap	0.216
13.	Clothes shall not be shared	0.230
14.	Not changing amulet/sacred thread when wet	0.316
15.	Caused by drugs for treating other diseases	0.321
16.	Neem leaves bath prevent disease	0.362
17.	Conjugal life spread disease	0.388
18.	Smearing wall and floor with cow dung prevent disease	0.411
19.	Working in synthetic clothes causes disease	0.455
20.	Cleaning the room with antiseptic prevents disease	0.460
21.	Wet clothes cause tinea	0.498
22.	Bathing in water using mustard oil cause disease	0.572
23.	Not changing undergarments for prolonged cause disease	0.641
24.	Sundried clothing prevents disease	0.721
25.	Washing clothes with antiseptic and soap prevent disease	0.751

**Table 2: Ranking of perception by the study participants**

Theme	Participant's perception of tinea	Grouping reason
<b>Care seeking behavior</b>	Government hospital visit as treatment was free	Related directly to care-seeking behavior
	OTC dependence owing to limited resources	
	Visiting quacks owing to trust and word of mouth	
	Frustration of disease recurrence despite spending money	
	Dermatologist's treatment is expensive with costly medications	
<b>Understanding of the predisposing factors of the disease</b>	Diabetes causes tinea	Related directly to the understanding of the predisposing factors of the disease
	Interruption of treatment in pregnancy	
	Disease spread by the prolonged wearing of unchanged underwear	
	Wet clothes cause tinea	



	Working in sun/synthetic clothes cause tinea	
	Conjugal life spread disease	
	Pond bath with mustard oil spread tinea	
<b>Ignorance about the disease</b>	Sharing towel, toiletries, and soaps do not influence disease	Related directly to lack of awareness and knowledge gap among participants
	Caused by seeking treatment for other diseases with drugs	
<b>Traditional belief</b>	Bathing in neem leaves prevents tinea	Related directly to the traditional beliefs of the subjects
	Floor smearing and wall earthing with cow dung prevent disease	
<b>Role of personal hygiene and Prevention</b>	Not taking regular bath predispose to tinea	Related directly to personal hygiene and prevention
	Using cloth sanitary pads during menstruation owing to limited resources	
	Avoiding the clothes sharing	
	Changing clothes only when wet	
	Changing clothes twice to prevent disease	
	Changing clothes with antiseptic prevents tinea	
	Sun drying the clothes prevent disease	
Washing clothes with antiseptics and soap prevents disease		

**Table 3: Pile sorting of perception of study subjects into the themes**