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KNOWLEDGE, ATTITUDE, AND PERCEPTION TOWARDS TINEA INFECTION AMONG PEOPLE IN KARACHI

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Abstract
Tinea infections, caused by dermatophytes such as Trichophyton, Microsporum, and Epidermophyton species, are common fungal infections that significantly impact public health and quality of life. Despite their prevalence, awareness and understanding of Tinea infections remain limited in many populations. This study aimed to assess the knowledge, attitudes, and perceptions (KAP) toward Tinea infections among individuals residing in Karachi, Pakistan. A cross-sectional survey was conducted between April 2023 and March 2024, using a validated 26-item questionnaire administered to 390 participants from varied demographic and educational backgrounds. The data were analyzed using SPSS version 21, with logistic regression and Relative Importance Index (RII) applied to assess associations and rank influencing factors. Results showed that while over half of the participants (57.1%) had heard of Tinea infections, many held misconceptions regarding its causes, symptoms, and treatment. For instance, 46.66% believed Tinea to be a viral infection, and only 17.4% recognized antifungal medication as the exclusive treatment. Knowledge regarding prevention and transmission was partial, with poor hygiene and sharing personal items being the most commonly recognized risks. Gender was not found to significantly influence knowledge levels. Recommendations for improving awareness received strong support, particularly regarding the role of friends, family, and healthcare providers. Overall, the study underscores a need for targeted health education programs to address knowledge gaps and promote early diagnosis and appropriate management of Tinea infections in Karachi.

Keywords: Tinea Infection, dermatophytes, fungal infections, public health, quality of life

1. Introduction

A distinct class of fungi known as dermatophytes, also known as *Tinea,* are keratinophilic fungi that cause infections by infecting keratinous tissue, such as the skin, hair, and nails of living humans and other animals (Reddy, 2017; Moskaluk and VandeWoude, 2022; Wollina et al., 2022). Three main genera make up this closely connected group of organisms: Microsporum spp. (M. canis and M. gypseum), Trichophyton spp. (T. mentagrophytes, T. rubrum, and T. verrucosum), and Epidermophyton. T. mentagrophytes and T. rubrum are two of the dermatophytes that cause dermatophytosis, the most common around the world (Pathania et al, 2018; Singh et al, 2019; Rudramurthy and Shaw, 2020; Rudramurthy and Kaur,2020; Borman and Summerbell, 2015).
T. mentagrophytes is a zoophilic dermatophyte that inhabits both domestic and wild rodents. It can live saprophytically in the soil and frequently attacks humans. It has been reported that the incubation period varies between 1 and 3 weeks in animals and 1 and 2 weeks in humans (Sylvén et al., 2023). This is a communicable fungus that mostly causes dermatophytosis, depending on the part of the body affected and the etiological agents involved, including Tinea corporis, Tinea pedis, Tinea unguium, and Tinea capitis (Alolofi et al., 2022; Chanyachailert et al., 2023). Consequently, dermatophytosis, the most common fungal infection in humans, is receiving more attention in research due to this emergence (Gnat et al., 2020; Martinez-Rossi et al, 2021). The dermatophytoses of the nails on the hands and feet are particularly challenging to treat with medication compared to other body sites (Gnat et al., 2020; AL-Khikani and Ayit, 2021). Accurate diagnosis is necessary for effective treatment. Microscopy and culture data must support a precise clinical diagnosis (Chanyachailert et al., 2023).

To diagnose fungal infections, it is critical to identify distinctive patterns of inflammation. The infected border is the best place to collect a sample for analysis with potassium hydroxide because it has the greatest concentration of hyphae. The infected border is red, scaly, and rises slightly. In cases of severe inflammation, vesicles can be found in the infected border. Lab tests can be used in many different ways to diagnose a patient (Atzori et al., 2023; Nagar, 2023). Direct microscopy visualization of the branched hyphae in keratinized material is the most crucial test for diagnosing dermatophyte infection. A scalpel blade should be used to gather the scale, which should then be placed in the exact middle of a microscopy slide and covered with a coverslip. Potassium hydroxide is applied at the coverslip's edge in a 5% to 20% solution. The mixture needs to be slowly heated over low heat until bubbles start to enlarge and the mixture becomes clear. The substance that holds cells together dissolves when potassium hydroxide is added, but fungi or epithelial cells are unaffected. Dermatophytes are identified under a microscope as septate, tube-like structures known as mycelia and hyphae. To see the whole section of the hyphae, which may be located at various depths, turn the focusing knob slightly back and forth. Hair infection with Microsporum species can be seen with a Wood's lamp; in a dark room, the hairs Fluorescence in a green color. On Sabouraud's glucose medium, fungal cultures are cultivated. Generally speaking, the same topical and oral medications work against all dermatophyte species, so it's not important to identify which one is causing the skin infection. Periodic acid Schiff or methenamine silver stains, being more susceptible than potassium hydroxide preparation or fungal culture, are the best tools for visualizing distal and lateral subungual onchomycosis (Durdu and Ilkit, 2023).

Due to the protracted course of treatment and infection recurrence, the development of methods like the polymerase chain reaction, a highly specific and sensitive test that can be used to diagnose a variety of microorganisms, including fungal pathogens, has been made possible by the development of molecular technology. In a prior study, we assessed nested PCR in patients with clinically suspected cases of onychomycosis that targeted the Chitin Synthase 1 (CHS1) gene (DDBJ accession no. AB003558), which is shared by three genera: Trichophyton, Epidermophyton, and Microsporum. In this investigation, we assessed a nested PCR that targets the CHS1 gene in hair as well as skin samples from individuals who have a clinical suspicion of having dermatophytosis. (Abdulhadi et al., 2023; Qi et al., 2023)

Tinea infections are still regarded as a serious public health issue that negatively impacts the quality of life (Sharma and Nonzom, 2021; Meena et al., 2022). Numerous factors, including lifestyle choices and climatic and environmental conditions, can contribute to fungal infections (Denham et al., 2019; Rokas, 2022). Numerous epidemiological investigations have examined the fluctuations in the incidence of various forms of Tinea infections in Karachi (Jehangir et al., 2019; Majeed et al., 2023). However, there hasn't been much research done on Karachi's public awareness and comprehension of the Tinea infection up to this point. Furthermore, there aren't enough public health campaigns to raise young adults' awareness of the symptoms, causes, and prevention of Tinea infection. Information about Tinea infection among young people in Karachi may have primarily come from the internet and certain online resources. Unfortunately, there haven't been any provincial or national campaigns to increase awareness among Karachi residents or those in other cities up to this point. Therefore, the purpose of this study is to investigate people's beliefs, behaviors, and knowledge regarding Tinea infection. To help the government's health division respond appropriately, the current study's findings are anticipated to give an overall understanding and knowledge of the people in Karachi who may be at risk of acquiring this infection.

2. Method

A cross-sectional survey was conducted with local people in Karachi, Pakistan, from April 2023 to March 2024. Using an adapted convenience sample method, a twenty-six-item questionnaire was created to evaluate people's knowledge, attitudes, and perceptions of tinea infection.

2.1. Study tool

Based on the literature review, a survey questionnaire comprising 32 questions was initially designed. These questions were deemed significant. Four academic experts served as a panel to verify the study tool's content. A 26-item questionnaire that satisfied the requirements of face validity was prepared and piloted with twenty participants after content validity was completed. When the reliability scale was used on these 20 participants, the alpha value was discovered to be 0.921, indicating that the tool is good at achieving the study's goals. Additionally, the Bartlett test of sphericity was used to assess the tool's adequacy to ease any concerns regarding its content. One useful method for determining content adequacy is the Kaiser-Meyer-Olkin measure of sampling adequacy. The present investigation yielded a significant interclass correlation coefficient, with a Kaiser-Meyer-Olkin value of 0.924. The fact that the Kaiser-Meyer-Olkin value was greater than 0.6 indicates that the contents of the instrument are adequate to fulfill the requirements of the study.

2.2. Contents of the questionnaire

Five sections made up the questionnaire: Section 1 contained six items intended to collect participant’s demographic data (Table 1); Section 2 assessed participants general knowledge about Tinea infections; participants were given the option to disclose their answers on a nominal scale [yes/no] for ease of use (Table 2); Section 3 contained three primary questions designed to gauge participants understanding of the types, prevention, and transmission of tinea infections (Table 3); and Section 4 contained five items intended to collect the participant knowledge and understanding regarding Tinea infections using a nominal measurement scale [yes/no] (Table 4). Three major items made up the final section of the analysis tool, which used a five-item Likert scale to record participants' opinions regarding Tinea infections (Table 5).

2.3. Data collection

The participants in this survey represented a range of age groups, genders, marital statuses, and educational backgrounds, and they belong to Karachi, Pakistan. The questionnaire was distributed to each of these participants, and no particular standards for being included or excluded were established for this study. Those who declined to participate in the study, however, were not included. As required by ethical guidelines, verbal consent was obtained from each participant to engage in this research.

2.4. Data analysis

The data was analyzed in version 21 of the Statistical Package for Social Sciences (SPSS). Binary and linear regression were used to examine the relationship between demographic and binary/ordinal responses. Utilizing a relative importance index (RII) (Eq. (1) (Khan et al., 2016), the primary factors impeding participants' opinions regarding the Tinea infection were determined. The primary factor influencing the Tinea infection reporting process was ranked as the item with the closest RII value, with items being ranked based on their RII values (Gündüz et al., 2013).

$$R = \Sigma W / (A*N) \quad (0 \leq RII \leq 1) \qquad (1)$$

Where: W denotes the participant's weight assigned to each factor, which goes from 1 to 5, with 1 denoting "strongly disagree" and 5 denoting "strongly agree". A represents the highest weight, which in this case is 5, and N denotes the total number of participants. Furthermore, regression analysis was used with gender categories (ref female) as covariates to determine the factors influencing the knowledge towards Tinea infection. For the analysis of the respondents' responses, a significant value of 0.05 was chosen.

3. Results:

A total of N=500 worth of participants were contacted, and 390 of them completed the survey, yielding a 78.0% response rate. N=308 (78.46%) of the participants were single, and the majority of the participants (75.38%) were female. The people's ages ranged from 16 to 65, with a median of 23. In terms of education, the majority of the participants had basic education, that is, N=144 (36.92%), N=120 (30.76%) were intermediate, N=58 (14.87%) were less than basic, and N=30 (7.69%) were in advanced education. However, N=38 (9.74%) did not disclose their level of education (Table 1).

Based on status criteria, the majority of the participants were from the lower class, N=180 (46.15%), followed by the middle class, N=173 (44.35%), and the lowest number of participants belonged to the upper class were N=37 (9.48%). Based on the socio-economic profile, N=158 (40.51) were permanently employed, N=134 (34.35) were temporarily employed, and N=98 (25.12) were self-employed (Table 1).

Table 1: Demographics of Participants Who Participated in the Survey, N=390

Demographics	**N (%)**
Gender	
Male	98 (25.1 %)
Female	294 (75.38 %)
Marital status	
Married	84 (21.5%)
Single	306 (78.46%)
Age [Mean SD257 ±8.1 years]	
Median 23 years [Range18–65 years]	
18–30 years	332 (85.12%)
31–40 years	28 (7.17%)
41–50 years	18 (4.61%)
51 and over	12 (3.07%)
Education	
Less than basic	58 (14.87%)
Basic	144 (36.92%)
Intermediate	120 (30.76%)
Advanced	30(7.69%)
Level not stated	38(9.74%)
Social Class	
Upper	37 (9.48%)

Middle	173 (44.35%)
Lower	180 (46.15%)
Employment	
Self-Employment	98 (25.12%)
Permanent Employment	158(40.51%)
Temporary Employment	134 (34.35%)

3.1 General Knowledge about Tinea Infection

In section one, out of the total participants, 57.1% (N=212) reported having heard of tinea infection, with a higher number of males (120) compared to females (92). Approximately half of the respondents (50.25%, N=196) believed that physical contact can transmit tinea, with 86 males and 110 females agreeing. However, 49.74% (N=194) responded negatively. Only 29.48% (N=115) believed that tinea infections are rare in Pakistan, while a majority (70.51%, N=275) correctly identified that it is common. More males (60) than females (55) responded "yes," whereas 140 males and 135 females responded "no." More than half (54.87%, N=214) believed that tinea infection produces a smell, while 45.12% (N=176) disagreed. The perception of gender bias in tinea infection was noted among 55.12% (N=215), with a higher number of females (140) than males (75) responding "yes" (Table 2). Only 31.79% (N=124) believed that the incidence of tinea infection is highest among women in their 20s and 30s, while the majority (68.20%, N=266) disagreed. A similar trend was observed regarding asymptomatic presentation; only 31.53% (N=123) believed tinea could occur without symptoms, while 68.46% (N=267) disagreed. In terms of anatomical location, 51.79% (N=202) correctly identified the groin area as a commonly affected site, while 48.20% (N=188) did not. Lastly, 46.66% (N=182) incorrectly believed that tinea is a viral infection, while a slightly higher percentage (53.33%, N=208) correctly identified it as not viral (Table 2). These results suggest moderate awareness but significant misconceptions regarding the transmission, symptoms, gender bias, and etiology of tinea infections among respondents.

Table 2: General Knowledge of Tinea Infection

Item no.	Statement	Yes %	No %	Yes Male/female	No Male/female	Gender
7	Before taking this survey, had you ever heard of Tinea Infection?	212 (54.35%)	178 (45.64%)	120/92	80/98	0.363* (0.122 – 2.199)
8	Does Physical contact transmit tinea?	196 (50.25%)	194 (49.74%)	86/110	90/104	0.082* (0.051 – 1.166)
9	Are Tinea infections rare in Pakistan?	115 (29.48%)	275 (70.51%)	60/55	140/135	0.032 (1.208 – 34.499)
10	Does Tinea Infection smell?	214 (54.87%)	176 (45.12%)	130/84	70/106	0.999 (0.480-1.799)
11	Is Tinea Infection gender bias?	215 (55.12%)	175 (44.87%)	75/140	60/115	0.715 (0.283 – 6.309)
12	Is the incidence of Tinea infection highest among women in their 20s and 30s?	124 (31.79%)	266 (68.20%)	50/74	160/106	0.999 (0.480-1.799)
13	Can a Tinea infection occur without symptoms?	123 (31.53%)	267 (68.46%)	50/73	160/107	0.999 (0.480-1.799)
14	Does Tinea infection mostly affect in groin area?	202 (51.79%)	188 (48.20%)	92/110	90/98	0.646* (0.20-13.344)
15	Is Tinea a viral infection?	182 (46.66%)	208 (53.33%)	100/82	110/98	0.260* (0.158 – 3.954)

Binary logistic regression.

*Significant ($p < 0.05$); gender (ref female).

Table 3: Knowledge about Tinea Infection N= 390

S.no.	Statement	Frequency	%
16	**Information related to types of Tinea infection**		
	Tinea Pedis	38	9.75 %
	Tinea Cruris	85	21.79 %
	Tinea Capitis	55	14.10 %
	Tinea Ungiuum	35	8.97 %
	Tinea Corporis	102	26.16 %
	Don't know	75	19.23 %
17	**Prevention of Tinea Infection**		
	Wash after you get dirty or sweaty	65	16.66%
	Keep your skin and feet dry	55	14.10%
	Don't go anywhere with barefoot	35	8.97%
	Wear clean, loose-fitting undergarments	75	19.23%
	Make sure your pet does not have ringworm	65	16.66%
	Don't share towels, combs, brushes, clothing or shoes	95	24.35%
18	**Spread/ Transmission of Tinea Infection**		
	Infected Person	62	15.89%
	Infected object such as towels, clothing and comb	65	16.66%
	An infected animal	25	6.41%
	Infected Soil	20	5.12%
	Warm Climate	54	13.84%
	Play contact sports	59	15.12%
	Poor hygiene condition	85	21.79%
	Communal baths (or) locker	20	5.12%

3.2 Knowledge about Tinea Infection

According to section three, the most commonly recognized type was Tinea Corporis (26.16%, N=102), followed by Tinea Cruris (21.79%, N=85). Other known types included Tinea Capitis (14.10%, N=55), Tinea Pedis (9.75%, N=38), and Tinea Unguium (8.97%, N=35). However, 19.23% (N=75) of respondents reported they did not know any types of tinea infection. The most commonly identified preventive measure was avoiding the sharing of towels, combs, brushes, clothing, or shoes (24.35%, N=95). This was followed by wearing clean, loose-fitting undergarments (19.23%, N=75), and washing after getting dirty and sweaty, and ensuring pets do not have ringworm, each cited by 16.66% (N=65).

Keeping the skin and feet dry (14.10%, N=55) and not walking barefoot (8.97%, N=35) were less commonly selected. The most frequently acknowledged transmission route was poor hygiene conditions (21.79%, N=85), followed by infected objects like towels or combs (16.66%, N=65), contact with infected persons (15.89%, N=62), and playing contact sports (15.12%, N=59). Other responses included warm climate (13.84%, N=54), infected animals (6.41%, N=25), communal baths or lockers (5.12%, N=20), and infected soil (5.12%, N=20) (Table 3). Overall, the findings indicate partial knowledge among respondents regarding tinea infection types, prevention, and transmission, with notable gaps in identifying less common sources and types.

3.3 Knowledge and understanding of Tinea infection

Only 165 respondents (42.3%) believed that a vaccine exists to protect against Tinea infection, while 225 (57.7%) correctly identified that no such vaccine exists. 139 participants (35.6%) agreed that avoiding contact with infected objects can prevent Tinea infection, while 251 (64.4%) responded "No." Only 55 respondents (14.1%) believed that once infected, an individual cannot be reinfected by the same organism, while the vast majority, 335 (85.9%), correctly disagreed. 68 participants (17.4%) were aware that Tinea infection can only be treated effectively with antifungal drugs, while 322 (82.6%) responded otherwise. 137 respondents (35.1%) incorrectly believed that self-remedies could treat Tinea infection, while 253 (64.9%) correctly disagreed (Table 4). Overall, the data reveals a lack of accurate knowledge among a considerable portion of respondents, particularly regarding effective treatment and prevention.

Table 4: Respondents' Knowledge and Understanding of Tinea Infection.

Item no.	Statement	Yes	No	Yes Male/ female	No Male/ female	Gender
19	Is there a vaccine that protects against Tinea infection?	165(42.3%)	225 (57.7%)	80/85	115/110	0.680 (0.195-.127)
20	Avoiding contact with infected objects can reduce the chances of Tinea infection	139 (35.6%)	251 (64.4%)	70/69	125/126	0.680 (0.362-.554)
21	Once an infected individual, not infected by the same organism	55 (14.1%)	335 (85.9%)	28/27	167/168	0.936 (0.248-.228)
22	The treatment of Tinea infection is only possible with antifungal drugs	68 (17.4%)	322 (82.6%)	35/33	160/162	0.891 (0.217-.249)
23	Any of the self-remedies will treat the Tinea infection	137 (35.1%)	253 (64.9%)	70/67	127/126	0.873 (0.490-.416)

Linear logistic regression.

*Significant ($p < 0.05$); gender (ref female).

Gender was not a significant predictor of knowledge accuracy in any of the items assessed, as indicated by the non-odds ratio in the logistic regression analysis.

Table 5: Recommendation for Tinea Infection.

S.no.	Statement	SA	A	N	D	SD	RI	Rank
24	If my friends knew about the Tinea Infection, they would better prevent themselves	128 (32.80%)	140 (35.89%)	58 (14.87%)	39 (10.0%)	25 (6.41%)	0.442	1
25	If my parents knew about the Tinea Infection, they would take preventive measures for it	182 (46.6%)	152 (38.9%)	25 (6.41)	20 (5.12%)	11 (2.8%)	0.357	2
26	If my doctor knew about the Tinea Infection details, he/she would take better care of their patient	205 (52.5%)	110 (28.2%)	45 (11.5%)	20 (5.12%)	10 (2.56%)	0.354	3

SA¼Strongly Agree, A¼Agree, N¼Neutral, D¼Disagree, SD¼Strongly Disagree RI¼relative index.

3.4 Recommendation for Tinea Infection

The findings related to recommendations for the prevention of Tinea infection (Table 5) revealed that respondents strongly believed in the importance of awareness among peers, family, and healthcare providers. The statement, *"If my friends knew about the Tinea infection, they would better prevent themselves,"* received the highest level of agreement, with 32.80% of respondents strongly agreeing and 35.89% agreeing. This statement achieved the highest Relative Importance Index (RI = 0.442), ranking it first among the recommendations, indicating that peer awareness is perceived as a key factor in promoting preventive behavior. The second-highest ranked statement was, *"If my parents knew about the Tinea infection, they would take preventive measures for it,"* with 46.6% of respondents strongly agreeing and 38.9% agreeing. The Relative Importance Index for this item was 0.357, suggesting that family awareness, particularly among parents, is also considered a significant influence in preventing the spread of Tinea infections.

The third statement, *"If my doctor knew about the Tinea infection details, he/she would take better care of their patient,"* received the highest proportion of strong agreement (52.5%), yet ranked third overall with a slightly lower RI of 0.354. While this indicates that clinical knowledge and involvement are highly valued, respondents perceived social and familial awareness to be marginally more impactful in the context of prevention. These results underscore the importance of targeted educational campaigns not only within the healthcare system but also across communities and households. Enhancing awareness among friends, family members, and healthcare providers may collectively contribute to more effective prevention and control of Tinea infections.

4. Discussion

The findings of this study highlight significant gaps in knowledge, attitudes, and perceptions regarding Tinea infections among the general population of Karachi. While over half of the respondents (57.1%) reported having prior awareness of Tinea infections, this awareness did not consistently translate into accurate understanding or preventive behavior. A notable proportion of participants held misconceptions about the nature and transmission of the infection, for example, nearly half (46.66%) mistakenly believed that Tinea is a viral infection, and only a small fraction (17.4%) correctly recognized antifungal therapy as the exclusive effective treatment.

These results align with global findings indicating persistent public misconceptions surrounding dermatophytic infections, despite their prevalence (Rudramurthy & Kaur, 2020; Sharma & Nonzom, 2021). The misidentification of Tinea as viral rather than fungal is particularly concerning, as it may lead to improper self-treatment and delayed medical consultation, exacerbating disease burden and transmission. Interestingly, the regression analysis revealed no significant association between gender and knowledge accuracy, suggesting that misinformation or lack of awareness about Tinea infections is uniformly distributed across both males and females. This further emphasizes the need for widespread, community-level educational initiatives rather than those targeted toward specific demographic groups.

Knowledge about the different types of Tinea infections was also limited. While Tinea Corporis and Tinea Cruris were relatively well-recognized, awareness of less common forms such as Tinea Unguium and Tinea Pedis remained low. Respondents demonstrated moderate understanding of preventive practices, with the most commonly cited measure being avoidance of shared personal items like towels or combs (24.35%). However, critical preventive actions such as maintaining dry skin and limiting barefoot exposure in communal spaces were less frequently identified. Regarding transmission, participants correctly acknowledged poor hygiene and contact with contaminated objects as major routes. However, fewer recognized indirect or environmental sources, such as communal baths or soil, can play significant roles in dermatophytosis transmission. These knowledge gaps suggest a need to enhance education not only about the infection itself but also about the less visible modes of transmission.

The section on attitudes and perceptions yielded encouraging insights. Most respondents agreed that increased awareness among friends (RI = 0.442), parents (RI = 0.357), and physicians (RI = 0.354) could significantly influence prevention and care. Although doctors were recognized as crucial in

managing infections, the slightly lower relative importance index suggests that social and familial networks are seen as more immediate and influential in encouraging health-protective behaviors. This finding reflects the strong communal and family-oriented structure of Pakistani society, where health decisions are often influenced by peer or family knowledge and support.

Taken together, these findings indicate a compelling need for multifaceted public health interventions. Educational campaigns should be implemented across schools, universities, community centers, and healthcare settings to address the lack of accurate knowledge and promote preventive behaviors. Additionally, training and resource materials for general practitioners should emphasize diagnostic methods, treatment options, and patient education strategies. Public health authorities should also consider integrating dermatophytosis education into broader skin health initiatives to enhance outreach and impact.

In conclusion, while some baseline awareness of Tinea infections exists among Karachi's population, critical gaps in understanding persist. The effectiveness of prevention and management strategies will depend on strengthening community-level knowledge, correcting misconceptions, and reinforcing the role of healthcare professionals in disease recognition and management.

5. Future Perspective

Given the high prevalence of misconceptions and limited awareness about Tinea infections identified in this study, future efforts should prioritize the development of community-wide educational interventions, particularly targeting youth and undereducated populations. Incorporating Tinea infection awareness into school curricula, public health campaigns, and community outreach programs can foster early recognition, prompt treatment, and effective prevention. Digital platforms, which many young adults rely on for health information, should also be utilized to disseminate scientifically accurate and accessible content on fungal infections.

Furthermore, future research should explore the effectiveness of these educational strategies in improving knowledge and altering health behaviors. Longitudinal studies could assess whether increased awareness leads to reduced infection rates and better treatment compliance. Collaborations between healthcare providers, educational institutions, and government health departments will be essential to address the broader challenge of dermatophytosis control in urban and rural settings across Pakistan.

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