JPHTD
Journal of Public Health and Tropical Diseases

Volume 2 Issue 1 (2026) March
Email: jphtd@unimus.ac.id
https://jurnalnew.unimus.ac.id/index.php/jphtd

ORIGINAL ARTICLE

Determinants of Superficial Dermatophytosis: The Role of Knowledge, Attitudes, and Personal Hygiene in a Cross-Sectional Study

Winda Yulia[1], Aulia Zalsabila Rosadi[2], Reno Keumalazia Kamarlis[3], Nanda Earlia[4], RM. Agung Pranata Kusuma Atmaja[5], Iflan Nauval[6]

[1] Department of Microbiology, Faculty of Medicine, Universitas Syiah Kuala, Indonesia
[2] Graduated Program of Faculty of Medicine, Universitas Syiah Kuala, Indonesia
[3] Department of Anatomical Pathology, Faculty of Medicine, Universitas Syiah Kuala, Indonesia
[4] Department of Dermatology and Venerology, Faculty of Medicine, Universitas Syiah Kuala, Indonesia
[5] Department of Parasitology, Faculty of Medicine, Universitas Syiah Kuala, Indonesia
[6] Department of Clinical Nutrition, Faculty of Medicine, Universitas Syiah Kuala, Indonesia

Corresponding author: **Winda Yulia**; email: winda@usk.ac.id

Submitted: November 26, 2025

Accepted: March 9, 2026

Published: March 31, 2026

Abstract

Background: Superficial dermatophytosis is a common fungal infection that remains a public health concern, particularly in communal living environments such as Islamic boarding schools where close contact and suboptimal hygiene practices facilitate transmission. Behavioral factors, including knowledge, attitudes, and personal hygiene, play an important role in influencing individual susceptibility to dermatophytosis. **Method**: This study aimed to examine the relationship between knowledge, attitudes, and personal hygiene and the incidence of superficial dermatophytosis among students in Islamic boarding schools in Darussalam District, Aceh Besar. **Results**: Knowledge (p= 0.023; OR= 2.424; 95% CI: 1.124–5.229), attitudes (p= 0.007; OR= 5.453; 95% CI: 1.428–20.816), and personal hygiene (p< 0.001; OR= 40.000; 95% CI: 5.120–312.470) were significantly associated with superficial dermatophytosis. Poor personal hygiene demonstrated the strongest association with disease occurrence. **Discussion**: These findings highlight that inadequate knowledge and unfavorable attitudes may lead to poor hygiene behaviors, increasing the risk of dermatophytosis transmission in densely populated educational settings. **Conclusion**: Behavioral factors, particularly personal hygiene, are key determinants of superficial dermatophytosis among Islamic boarding school students. Strengthening health education, hygiene promotion, and preventive interventions within boarding school settings is essential to reduce the burden of dermatophytosis.

Keywords: dermatophytosis, tropical disease, personal hygiene, health behavior, attitude

INTRODUCTION

Dermatophytosis is a prevalent cutaneous infection caused by a group of keratinophilic fungi known as dermatophytes. These organisms utilize keratin, a structural protein present in the skin, hair, and nails, as a nutrient source, thereby facilitating infection in keratinized tissues [1–3]. Clinically, dermatophytosis is commonly referred to as ringworm or tinea, depending on the affected anatomical site [4,5]. Globally, it represents the most widespread form of superficial fungal infection, with a growing incidence reported in recent years. Notably, an increasing proportion of cases are characterized by recurrence and resistance to conventional treatment, posing significant challenges for effective management [6,7].

On a global scale, the World Health Organization (WHO) estimates that approximately 25% of the world's population is affected by dermatophytosis [4]. The prevalence is notably higher in Asia, reaching 35.6%. In Indonesia, dermatophytosis accounts for more than half (52%) of all superficial fungal skin infections [8]. Specifically, in Aceh, epidemiological data indicate a high burden among adolescents, particularly those residing in crowded environments such as Islamic boarding schools (dayah), where transmission is more likely to occur [9].

Dermatophytosis is readily transmitted through direct skin-to-skin contact, contact with infected animals, or the sharing of personal items such as towels and clothing [10–12]. Previous studies have identified several behavioral and environmental determinants that contribute to its transmission, including poor personal hygiene, limited knowledge, and negative attitudes toward skin health [1,8,12,13]. In boarding school settings, the risk of infection is significantly elevated due to overcrowded living conditions and the frequent sharing of facilities among students [14].

Adolescents are at increased risk of dermatophytosis due to their high levels of physical activity, which often result in excessive sweating and create a favorable environment for fungal growth [15,16]. Beyond the associated physical discomfort, such as pruritus, the infection may adversely affect students' quality of life, as well as impair academic performance and psychological well-being [17].

Even though this is a major health problem, there are not many studies in Aceh that look at how knowledge, attitude, and hygiene work together to cause this infection. Therefore, this study was conducted to analyze how these three factors are linked to the occurrence of dermatophytosis among students in an Islamic boarding school in the Darussalam District.

METHOD

This study employed an observational analytic design with a cross-sectional approach. The research was conducted at Dayah Darul Ihsan Abu Krueng Kalee, Darussalam District, Aceh Besar, from August to September 2025. The study population consisted of all students residing at the dayah. A total of 111 respondents were included using non-probability consecutive sampling based on predefined inclusion and exclusion criteria. Inclusion criteria were students aged 10–19 years who resided at the dayah and consented to participate. Students with communication or cognitive impairments or those who withdrew during data collection were excluded.

The independent variables included the level of

knowledge, attitudes toward the prevention of dermatophytosis, and personal hygiene practices. These variables were assessed using a structured questionnaire adapted from previously validated instruments. Knowledge and attitude scores were categorized as good (>4) or poor (≤4), whereas personal hygiene practices were classified as good (>7) or poor (≤7). The dependent variable was the occurrence of superficial dermatophytosis, which was determined through clinical examination and physician diagnosis based on the presence of characteristic dermatophytic lesions.

Data were collected through interviewer-assisted questionnaires and clinical examinations. Statistical analysis was performed using IBM SPSS version 21. Descriptive statistics were presented as frequencies and percentages. Bivariate analysis was conducted using the Chi-square test, and associations were quantified using Odds Ratios (OR) with 95% confidence intervals. A p-value < 0.05 was considered statistically significant.

RESULTS

Superficial dermatophytosis diagnosed for almost half of respondents (45%). The most common clinical type was tinea corporis (22.5%), followed by tinea cruris (11.7%), tinea pedis (6.3%), and tinea capitis (4.5%) (Figure 1).

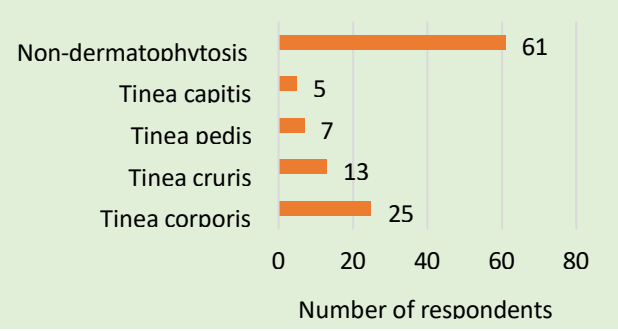

Figure 1. Superficial dermatophytosis findings (n= 111)

Most respondents demonstrated a satisfactory level of knowledge regarding dermatophytosis, with 55.9% classified as having good knowledge. This indicates that more than half of the participants possessed an adequate understanding of the causes, transmission, and prevention of this fungal infection. In addition, a substantial proportion of respondents (87.4%) exhibited positive attitudes toward the prevention of dermatophytosis, reflecting a generally favorable perception of the importance of preventive measures and health-promoting behaviors. Furthermore, 81.1% of participants reported good personal hygiene practices, suggesting that the majority were actively engaging in behaviors that could reduce the risk of infection. Collectively, these findings highlight that while knowledge levels were moderate, attitudes and practices related to dermatophytosis prevention were predominantly positive among the respondents (Table 1)

Table 1. Characteristics of Respondents (n= 111)

Variable	Frequency (n)	Percentage (%)
Knowledge Level		
Good	62	55,9
Poor	49	44,1
Attitude		
Good	97	87.4
Poor	14	12.6
Personal Hygiene		
Good	90	81.1
Poor	21	18.9
Superficial Dermatophytosis incidence		
Yes	50	45.0
No	61	55.0

A significant association was observed between knowledge level and superficial dermatophytosis (p= 0.023). Respondents with poor knowledge had a 2.42-fold higher risk of infection compared to those with good knowledge (OR= 2.42; 95% CI: 1.12–5.22). Attitudes toward prevention were also significantly associated with dermatophytosis occurrence (p=0.007). Students with poor attitudes were 5.45 times more likely to develop superficial dermatophytosis compared to those with good attitudes (OR= 5.45; 95% CI: 1.42–20.81). Personal hygiene showed the strongest association with dermatophytosis (p= 0.001). Respondents with poor hygiene practices had a 40-fold increased risk of infection compared to those with good hygiene (OR= 40.00; 95% CI: 5.12–312.47) (Table 2).

Table 2. Association between Knowledge, Attitude, Personal Hygiene, and Superficial Dermatophytosis

Variable	OR	95% CI	p-value
Poor Knowledge	2.42	1.12 – 5.22	0.023
Poor Attitude	5.45	1.42 – 20.81	0.007
Poor Personal Hygiene	40.00	5.12 – 312.47	0.001

OR = Odds Ratio; CI = Confidence Interval

DISCUSSION

This study shows that fungal skin infections are still a major health issue for students living in boarding schools. We found that 45% of students had the infection. This is similar to other studies of people living in crowded places where sharing rooms and bathrooms makes it easy for the fungus to spread [14,18].

Knowledge plays a critical role in the prevention of dermatophytosis. Individuals who lack an adequate understanding of transmission mechanisms are more likely to engage in behaviors that increase the risk of infection [19]. The findings of this study demonstrate a significant association between low levels of knowledge and the occurrence of infection, which is consistent with previous research [8,12,20]. Furthermore, other studies have reported that individuals with limited knowledge of the disease are significantly more susceptible to infection, thereby underscoring the importance of effective health education interventions [12].

Attitude also plays a crucial role in the prevention of dermatophytosis. Students who do not perceive personal hygiene as important are more likely to develop the infection. Consistent with these findings, studies conducted in both hospital and community settings have demonstrated that individuals with negative attitudes toward preventive measures are at a higher risk of infection [13]. Fundamentally, an individual's perception of health significantly influences daily behaviors and practices, which in turn affect disease risk [21].

Personal hygiene was the most important factor in this study. Poor habits—like not showering enough, sharing towels or clothes, and leaving the skin damp—create the perfect environment for fungus to grow [1,7]. The very high risk found in our data shows that hygiene is the most critical part of staying healthy. This is especially true in humid and crowded places like a boarding school [22,23].

From a biological standpoint, poor hygiene keeps the skin wet and covered. This allows the

fungus to use special enzymes to break down the skin and stay there [24-26]. Because of this, the best way to stop the spread of infection in schools is to focus on better hygiene.

CONCLUSION

There is a statistically significant association between knowledge level, attitudes, and personal hygiene practices and the occurrence of superficial dermatophytosis among students at Dayah Darul Ihsan Abu Krueng Kalee. Among these factors, poor personal hygiene practices constitute the most influential risk factor for infection.

RECOMMENDATIONS

Health education programs emphasizing personal hygiene and dermatophytosis prevention should be strengthened in boarding school environments. Regular skin examinations and continuous health promotion involving students and administrators are recommended to reduce disease transmission.

ACKNOWLEDGEMENTS

The authors would like to thank the management of Dayah Darul Ihsan Abu Krueng Kalee, all participating students, and health professionals who contributed to this study.

REFERENCES

[1] Riyadi E, Batubara DE, Pratiwi Lingga FD. Association between personal hygiene and dermatophytosis incidence. *J Pandu Husada*. 2020; 1(4): 204. https://jurnal.umsu.ac.id/index.php/JPH/article/view/5307/4818

[2] de Hoog GS, Dukik K, Monod M, Packeu A, Stubbe D, Hendrickx M, et al. Toward a novel multilocus phylogenetic taxonomy for the dermatophytes. *Mycopathologia*. 2017; 182(1–2): 5–31. https://doi.org/10.1007/s11046-016-0073-9

[3] Moskaluk AE, VandeWoude S. Current topics in dermatophyte classification and clinical diagnosis. *Pathogens*. 2022; 11(9). https://doi.org/10.3390/pathogens11090957

[4] World Health Organization. Ringworm (tinea). 2025. Available from: https://www.who.int/news-room/fact-sheets/detail/ringworm-(tinea)

[5] Sharma B, Nonzom S. Superficial mycoses, a matter of concern: global and Indian scenario—an updated analysis. *Mycoses*. 2021; 64(8): 890–908. https://doi.org/10.1111/myc.13309

[6] Belmiloud B, Shahar HK, Abdulrahman H. Determinants of risk factors for dermatophyte infections related to patients' knowledge, attitude, and hygiene practices among patients attending a dermatology department in a government hospital in Setif Province, Algeria. *Malays J Med Health Sci*. 2022; 18(1): 206–213. https://mjmhs.msj.org.my/

[7] Gnat S, Łagowski D, Nowakiewicz A, Osińska M, Kopińskił. Population differentiation, antifungal susceptibility, and host range of *Trichophyton mentagrophytes*. *Eur J Clin Microbiol Infect Dis*. 2020; 39(11): 2099–2113. https://link.springer.com/article/10.1007/s10096-020-03952-2

[8] Arifaa K, Zuleikha T, Hatta S. Management of a 23-year-old female patient with tinea pedis through a family doctor approach. *J Health Agromedicine*. 2025; 12(1): 215–228. https://juke.kedokteran.unila.ac.id/index.php/agro/search/authors/view?givenName=Arifaa%20Thalitha%20Zuleikha&familyName=&affiliation=FK%20UNILA&country=ID&authorName=Arifaa%20Thalitha%20Zuleikha

[9] Prabowo DA, Anggraini MT, Ratnaningrum K, et al. Knowledge level, personal hygiene, and home environment associated with tinea incidence among fishermen in Kalianda District, Indonesia. *J Anestesi J Ilmu Kesehatan dan Kedokteran*. 2025; 3. https://jurnal.stikeskesdam4dip.ac.id/index.php/Anestesi/article/view/1614

[10] Gnat S, Łagowski D, Dyląg M, Nowakiewicz A. European hedgehogs (*Erinaceus europaeus* L.) as a reservoir of dermatophytes in Poland. *Microb Ecol*. 2022; 84(2): 363–375. https://doi.org/10.1007/s00248-021-01866-w

[11] Patel NH, Padhiyar JK, Patel AP, Chhebber AS, Patel BR. Psychosocial and financial impact of dermatophytosis: a questionnaire-based observational study. *Indian Dermatol Online J*. 2020; 10(4): 481–485.

https://link.springer.com/article/10.1007/s10096-020-03952-2

[12] Segal E, Elad D. Human and zoonotic dermatophytoses: epidemiological aspects. *Front Microbiol*. 2021; 12(August):1–10. https://doi.org/10.3389/fmicb.2021.713532

[13] Leung AKC, Lam JM, Leong KF, Hon KL. Tinea corporis: an updated review. *Drugs Context*. 2020; 9: 1–12. https://doi.org/10.7573/dic.2020-5-6

[14] Tang C, Kong X, Ahmed SA, Thakur R, Chowdhary A, Nenoff P, et al. Taxonomy of the *Trichophyton mentagrophytes/T. interdigitale* species complex harboring the multiresistant genotype *T. indotineae*. *Mycopathologia*. 2021; 186(3): 315–326. https://doi.org/10.1007/s11046-021-00544-2.

[15] Al Aboud AM, Crane JS. Tinea capitis. Treasure Island (FL): StatPearls Publishing; 2025. https://www.ncbi.nlm.nih.gov/books/NBK536909/

[16] Tria F, Sari A, Angraini DI. Management of tinea corporis in cracker makers using a family medicine approach. 2020; 9: 12–18. http://repository.lppm.unila.ac.id/25221/1/2020_Juli_Majority_fauzia_DIA.pdf

[17] Keshwania P, Kaur N, Chauhan J, Sharma G, Afzal O, Alfawaz Altamimi AS, et al. Superficial dermatophytosis across the world's populations. *ACS Omega*. 2023; 8(35): 31575–31599. https://pubs.acs.org/doi/10.1021/acsomega.3c01988

[18] Vazheva G, Zisova L. Tinea barbae profunda caused by *Trichophyton rubrum*: an autoinoculation from primary tinea pedis. 2021; 63(2): 292–296. https://pubmed.ncbi.nlm.nih.gov/33932023

[19] Supenah P. Dermatophyte fungal infection among natural stone workers' toenails in Bobos Village, Dukupuntang District, Cirebon Regency. *Health Information Journal*. 2020; 12(1): 38–45. https://doi.org/10.36990/hijp.vi.166

[20] Zhan P, Ge YP, Lu XL, She XD, Li ZH, Liu WD. Two feet–one hand syndrome: a case–control analysis and laboratory study in two dermatology hospitals in China. *Clin Exp Dermatol*. 2024. DOI 10.1111/j.1365-2230.2009.03458.x

[21] Sidabalok F, Nababan KA, Nababan ES. Knowledge, attitudes, and practices of grade XI science students regarding tinea cruris at SMA Negeri 1 Kutalimbaru, academic year 2016/2017. 2022; 12(2): 106–112. https://ojs.lppmmethodistmedan.net

[22] Dhakal B, Shrestha BL, Shah S, Rijal S, Karki BB, Pangeni PM, et al. Knowledge, practice, and infection status of prisoners toward dermatomycosis in Nepal. *Front Public Health*. 2024; 12(July): 1–7. https://doi.org/10.3389/fpubh.2024.1406346

[23] Sukmawati S, Ahmad H, Islam F, Akbar F. Risk factors for scabies incidence among students at Islamic boarding schools in Mamuju Regency, Indonesia. *J Med Health*. 2025; 7(2). https://doi.org/10.28932/jmh.v7i2.9245

[24] Jartarkar SR, Patil A, Goldust Y, Cockerell CJ, Schwartz RA, Grabbe S, et al. Pathogenesis, immunology, and management of dermatophytosis. *J Fungi*. 2022; 8(1): 1–15. https://doi.org/10.3390/jof8010039

[25] Deng R, Wang X, Li R. Dermatophyte infection: from fungal pathogenicity to host immune responses. 2023; (November): 1–15. https://doi.org/10.3389/fimmu.2023.1285887

[26] Zorah VB. Association between personal hygiene and obesity with tinea cruris incidence among patients at Amanda Medika Clinic. 2024; 2(3). https://journal.arikesi.or.id/index.php/Vitamin/article/view/463/552