



Morphological Spectrum of Superficial Mycoses in a Rural Healthcare Setting of Bangladesh



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Abstract

Background: Superficial mycoses or superficial fungal infections are common dermatological conditions worldwide, contributing significantly to morbidity, particularly in rural areas with limited hygiene and healthcare access. Despite their prevalence, data on morphological patterns of superficial fungal infections (SFIs) in rural Bangladesh remain scarce. **Objective:** The purpose of the present study was to determine the morphological patterns and distribution of superficial fungal infections among patients in a rural area of Bangladesh, stratified by age and gender. **Methodology:** This cross-sectional study was carried out in the Department of Dermatology & Venereology at Monno Medical College & Hospital in Manikganj, Bangladesh, from January 2023 to December 2023 for period of one year. The diagnosis of SFIs were done by qualified dermatologist from OPD on the basis of thorough medical history, clinical features and detailed cutaneous examination and some relevant investigations. Data were analyzed descriptively using frequencies and percentages. **Results:** Tinea corporis (30.8%) and tinea cruris (24.23%) were the most prevalent infections. Females showed higher prevalence of tinea corporis, tinea faciei, and candidal intertrigo, whereas males were more affected by tinea cruris and tinea barbae. Age-stratified analysis revealed children had higher rates of pityriasis versicolor and tinea faciei, adults had predominance of tinea corporis and tinea cruris, and elderly patients exhibited higher tinea corporis prevalence. **Conclusion:** SFIs are highly prevalent in rural Bangladesh, with distinct age- and gender-specific patterns. These findings highlight the need for targeted hygiene education, early diagnosis, and timely antifungal treatment to reduce disease burden. [Bangladesh Journal of Infectious Diseases, June 2026;13(1):19-24]

Keywords: Superficial fungal infections; rural Bangladesh; morphological spectrum; dermatology

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Introduction

Many dermatological conditions act as manifestations of internal systemic disorders since the skin represents the body's largest organ. While such diseases are common and contribute

considerably to morbidity, they are generally associated with a low rate of mortality¹. Fungal infections of the skin and nails have become increasingly widespread in recent decades, affecting an estimated 20.0% to 25.0% of the global

population². Superficial fungal infections (SFIs) affect millions of individuals globally, with an estimated lifetime risk ranging between 10.0% and 20.0% cases³. Approximately 30.0 to 40.0% of the population suffers from skin diseases, with approximately 80% of these cases attributed to scabies and pyogenic infections in Bangladesh⁴. This infection can affect both healthy individuals and those with compromised immunity. The estimated lifetime risk of developing a dermatophytic infection ranges from 10.0% to 20.0% of cases⁵.

The distribution and types of fungal isolates are strongly influenced by geographic location and climatic conditions. The warm and humid climate of our region provides a favorable environment for fungal proliferation⁶. Approximately 7.0 to 15.0% of pediatric clinical cases are linked to superficial fungal infections (SFIs), which encompass dermatophytic infections such as tinea capitis, tinea facies, tinea corporis, tinea unguium, tinea manum, and tinea pedis, as well as non-dermatophytic conditions like pityriasis versicolor, cutaneous candidiasis, tinea nigra, black Piedra, and white Piedra⁷.

Tinea capitis is recognized as the most common superficial fungal infection affecting elementary school children⁸. In rural settings, where sanitation and healthcare services are often inadequate, superficial fungal infections tend to be more prevalent. Contributing factors include poor personal hygiene, low awareness of preventive practices, and restricted availability of antifungal treatments⁹.

In urban environments, despite better access to healthcare, superficial fungal infections remain fairly common. Contributing factors include overcrowding, inadequate sanitation in some areas, frequent use of shared spaces such as public pools and gyms, and a higher prevalence of individuals with weakened immune systems due to illness or stress¹⁰. Superficial fungal infections are especially common among school-aged children, causing significant morbidity and negatively affecting quality of life. In low- and middle-income countries such as Bangladesh, these infections frequently lead to reduced school attendance¹¹⁻¹².

In rural regions additional risk factors include inadequate personal hygiene, overcrowded living conditions, poor sanitation, frequent skin-to-skin contact, and low socioeconomic status, all of which increase the likelihood of superficial fungal infections among school-aged children¹³.

Superficial fungal infections are a major public

health concern in Bangladesh, particularly in rural areas where poor hygiene, limited healthcare access, and humid climatic conditions favor fungal growth. Despite their high prevalence, data on morphological patterns of these infections remain limited.

Understanding these patterns is essential for developing effective preventive and treatment strategies. The aims of the study to determine the morphological patterns and distribution of superficial fungal infections among patients in a rural area of Bangladesh, providing insight for better diagnosis and management.

Methodology

Study Settings and Population: This cross-sectional study was conducted in a rural area of Bangladesh to evaluate the morphological patterns of superficial fungal infections (SFIs) among different age groups and genders. The study was carried out in the Department of Dermatology & Venereology of Monno Medical College & Hospital in Manikganj, Bangladesh, from January 2023 to December 2023 for period of one year. The patients presenting with suspected superficial fungal infections were enrolled using a convenience sampling method. Participants were stratified by age into three categories: children (0–14 years), adults (15–64 years), and elderly patients (≥ 65 years).

Selection Criteria: Inclusion Criteria were patients of any age and gender presenting with clinical features suggestive of superficial fungal infections and the residents of the rural study area who consented to participate. Exclusion Criteria were patients currently receiving systemic antifungal therapy, individuals with immunocompromising conditions such as HIV or active malignancy and patients with primary dermatologic disorders unrelated to fungal infections.

Study Procedure: Procedure: Demographic data including age, gender, and occupation were recorded. Clinical examination was performed to identify and classify the types of superficial fungal infection. Fungal infections were categorized according to their morphological pattern, including tinea corporis, tinea cruris, tinea faciei, tinea capitis, tinea pedis, tinea manum, tinea barbae, pityriasis versicolor, onychomycosis, chronic paronychia, candidal intertrigo, genital candidiasis, oral thrush, and tinea incognito. Diagnosis was made primarily through clinical evaluation, supported by KOH microscopy when required.

Statistical Analysis: Descriptive statistics were

used to summarize the data. Frequencies (n) and percentages (%) of each type of fungal infection were calculated for the total population, age groups, and gender using Microsoft Excel, and the results were presented in tables to show the distribution patterns clearly.

Ethical Considerations: Informed consent was obtained from all participants or their guardians in the case of minors. The study protocol was approved by the Institutional Ethics Committee, and all procedures followed standard ethical guidelines for research involving human participants. Formal ethics approval was granted by MAG Osmani Medical College, Sylhet; Memo no: IRB/MoMC/2025/012.

Results

A total of 974 patients with superficial fungal infections (SFIs) were analyzed after fulfilling the inclusion and exclusion criteria. Where majority participants aged between 15 to 64 years which was 770 (79.0%) followed by 0 to 14 years and 65 years and more which were 151(15.5%) and 53(5.5%) respectively (Table 1).

Table 1: Distribution of Patients according to Age Group (n=974)

Age Group	Frequency	Percent
0 to 14 years	151	15.5
15 to 64 years	770	79.0
≥65 years	53	5.5
Total	974	100.0

Among 974 patients, female patients were predominant which was 540 (55.44%) and male were 434 (44.56%) (Figure I).

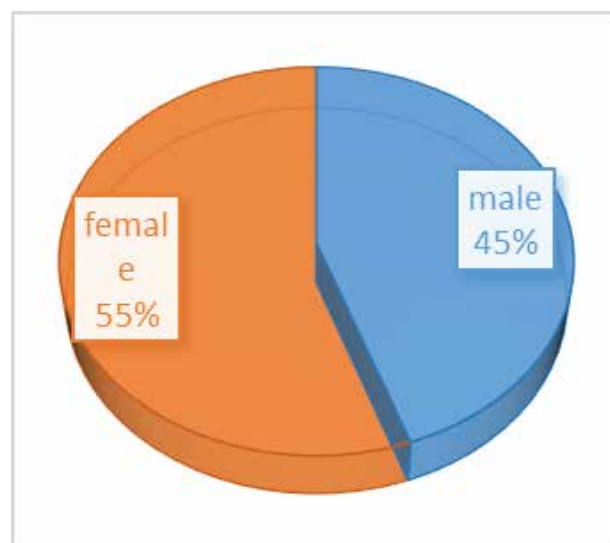


Figure I: Distribution of Participant According to Gender (n= 974)

In this study the most common fungal infection overall was tinea corporis 300(30.8%), followed by tinea cruris 236(24.2%) and pityriasis versicolor 110(11.3%) (Figure II).

Among 151(15.50%) pediatric (1-14years) cases, tinea corporis 38(25.17%) was the most common infection, followed by pityriasis versicolor 35(23.18%) and tinea faciei 21(13.61%). Tinea capitis 8(5.30%) was primarily seen in this age group. The age group between 15 to 64 years

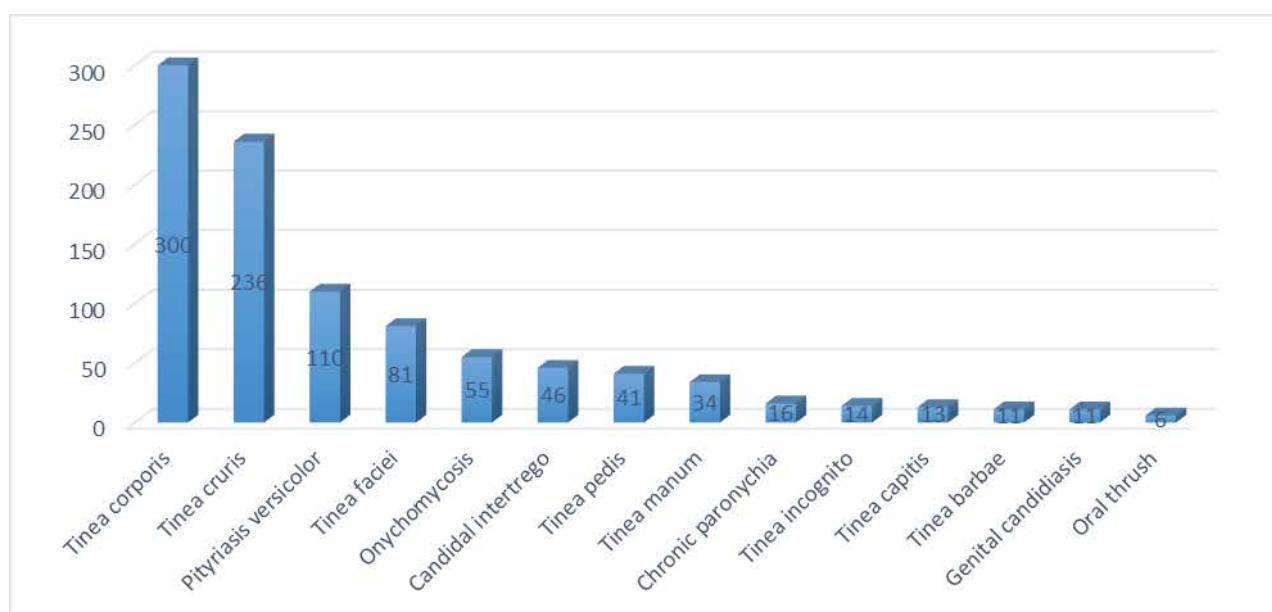


Figure II: Distribution of Participant According to Morphological Pattern of Fungal Disease

Table 2: Morphological Pattern of Fungal Disease in Different Age Group

Name of the fungal infections	1 to 14 years	15 to 64 years	≥65 years
Tinea corporis	38(25.2%)	238(30.1%)	24(45.3%)
Tinea cruris	18(11.9%)	202 (26.2%)	16(30.2%)
Pityriasis versicolor	35(23.2%)	75 (9.7%)	0(0.0%)
Tinea faciei	21(13.6%)	59(7.7%)	1(1.9%)
Onychomycosis	5(3.3%)	46 (6.0%)	4(7.6%)
Candidal intertregio	7(4.6%)	34(4.4%)	5(9.4%)
Tinea pedis	2(1.3%)	37 (4.8%)	2(3.8%)
Tinea manum	1(0.7%)	33(4.3%)	0(0.0%)
Chronic paronychia	3(2.0%)	13 (1.7%)	0(0.0%)
Tinea incognito	5(3.3%)	9(1.2%)	0(0.0%)
Tinea capitis	8(5.3%)	5 (0.7%)	0(0.0%)
Tinea barbae	0(0.0%)	11 (1.4%)	0(0.0%)
Genital candidiasis	5(3.3%)	5 (0.7%)	0(0.0%)
Oral thrush	3(2.0%)	3 (0.4%)	1(1.9%)
Total	151(15.5%)	770(79.0%)	53(5.5%)

showed the highest burden with 770 cases (79.01%), predominantly. Tinea corporis 238 (30.09%) and tinea cruris 202 (26.23%) were the most frequent infections. Pityriasis versicolor 75 (9.74%), tinea faciei 59 (7.66%), and onychomycosis 46 (5.98%) were also commonly observed. Tinea barbae 11 (1.43%) was reported in this age group. Out of 53 elderly (≥65 years) cases, tinea corporis 24 (45.28%) and tinea cruris 16 (30.19%) were the predominant infections. Candidal intertrigo 5 (9.43%) and onychomycosis 4 (7.55%) were also noted. No cases of tinea manuum, tinea capitis, tinea barbae, tinea incognito, or pityriasis versicolor were found in this age group (Table 2).

Table 3: Morphological Pattern of Different Fungal Disease According to Gender

Fungal Infections	Male	Female
Tinea corporis	114(11.7%)	186(19.1%)
Tinea cruris	128(13.1%)	108(11.1%)
Pityriasis versicolor	55(5.6%)	55(5.6%)
Tinea faciei	36(3.7%)	45(4.6%)
Onychomycosis	26(2.7%)	29(3.0%)
Candidal intertregio	21(2.2%)	25(2.6%)
Tinea pedis	14(1.4%)	27(2.8%)
Tinea manum	8(0.8%)	26(2.7%)
Chronic paronychia	4(0.4%)	12(1.2%)
Tinea incognito	2(0.2%)	12(1.2%)
Tinea capitis	8(0.8%)	5(0.5%)
Tinea barbae	11(1.1%)	0(0.0%)
Genital candidiasis	4(0.4%)	7(0.7%)
Oral thrush	3(0.3%)	3(0.3%)
Total	434(44.6%)	540(55.4%)

Tinea corporis was more prevalent in females (19.10%) than males (11.70%), whereas tinea cruris was slightly higher in males (13.14%) compared to females (11.09%). Tinea barbae was exclusively seen in males (1.13%), while genital candidiasis was more frequent in females (0.72%). Pityriasis versicolor showed equal distribution between both sexes (5.64%) (Table 3).

Discussion

Superficial fungal infections encompass a diverse group of dermatological conditions affecting keratinized tissues such as skin, hair, and nails, each with distinct morphological patterns that vary across populations and geographical settings¹⁴. This study comprehensively investigated the morphological patterns of superficial fungal infections (SFIs) across various age groups and between genders attending the dermatology outpatient department of Monno Medical College and Hospital, 974 patients has been selected according to inclusion and exclusion criteria. The analysis revealed that tinea corporis was the most prevalent infection overall, accounting for 30.8% of cases, followed by tinea cruris, which constituted 24.23% of the infections. These findings are consistent with prior research conducted in Nepal, where dermatophytosis were similarly identified as the predominant type of fungal infection in rural populations, indicating the common occurrence of these infections in comparable geographic and socioeconomic settings.

The observed distribution of SFIs also reflects the influence of environmental factors, personal hygiene practices, and cultural habits on the prevalence and presentation of these infections¹⁵. The noticeably

higher burden of tinea corporis observed among females (19.1%) in comparison to males (11.7%) may be explained by several contributing factors, including increased engagement in household activities, the habitual use of occlusive or tight-fitting clothing, and prolonged exposure to humid or damp working environments. These factors create conditions favorable for fungal growth and infection. Such gender-specific differences in the prevalence of tinea corporis are consistent with previous findings reported by Ahmed et al¹⁶ and Shah et al¹⁷, who also noted a higher susceptibility among women in similar community settings. In adults aged 15 to 64 years, tinea corporis (30.1%) and tinea cruris (26.2%) remained most prevalent, which corresponds to findings by Verma and Madhu¹⁸, who reported increased incidence among individuals engaged in outdoor labor and frequent sweating. In contrast, children (0 to 14 years) showed a higher proportion of tinea corporis (25.2%) and pityriasis versicolor (23.2%), consistent with studies from tertiary care centers in Central India, suggesting immature immunity and close physical contact as contributing factors¹⁹.

Among the elderly population (more than 65 years), tinea corporis (45.3%) was the leading infection, followed by tinea cruris (30.2%), supporting previous findings by Strbo et al²⁰, who noted a higher prevalence of dermatophytosis in elderly individuals due to immunosenescence, chronic diseases, poor hygiene, and reduced skin barrier function. Notably, onychomycosis (5.7%) overall and 7.6% cases in the elderly was less common compared to Western studies, where prevalence exceeds 20% cases²¹. This may reflect occupational habits such as barefoot walking and lower cosmetic concern, leading to underreporting. Additionally, tinea barbae (1.13%) was observed exclusively in males, similar to earlier studies by Kuruvella et al²² due to beard-shaving practices and animal exposure.

Clear gender-specific differences were observed in the distribution of superficial fungal infections, with females exhibiting a higher prevalence of tinea manuum, tinea faciei, and candidal intertrigo, whereas males demonstrated a greater occurrence of tinea cruris and tinea barbae. These patterns reflect differences in occupational exposure, personal hygiene practices, and clothing habits between genders. Similar gender-related disparities have been consistently reported in previous studies, supporting the notion that biological, behavioral, and environmental factors collectively influence the susceptibility to specific fungal infections^{23,24}. The high prevalence of SFIs in adults and females

underscores socio-environmental factors such as humidity, overcrowding, use of synthetic clothing, and inadequate health-seeking behavior.

This study has several limitations. Being a single-center, cross-sectional study in a rural area, the findings may not be generalizable to urban or other regional populations. Diagnosis relied primarily on clinical evaluation, with limited use of confirmatory laboratory tests such as fungal culture or PCR, which may have affected diagnostic accuracy. Seasonal variations were not accounted for, potentially influencing the prevalence of certain infections. Additionally, socioeconomic and environmental factors were not analyzed in depth, limiting understanding of their impact on infection patterns.

Conclusion

This study provides a comprehensive overview of the morphological patterns of superficial fungal infections (SFIs) in a rural population of Bangladesh, revealing that tinea corporis and tinea cruris were the most prevalent infections, followed by pityriasis versicolor and tinea faciei. Gender-specific differences were evident, with females more affected by tinea corporis, tinea faciei, and candidal intertrigo, while males showed higher prevalence of tinea cruris and tinea barbae. Age-stratified analysis demonstrated higher burdens of tinea corporis and tinea cruris among adults and the elderly, whereas children were more affected by pityriasis versicolor and tinea faciei. These findings underscore the need for targeted public health interventions, improved hygiene awareness, and timely antifungal treatment in rural communities to reduce morbidity associated with SFIs.

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Conflict of interest:

The authors declared no conflict of interest.

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Authors' contributions

Islam MI, Islam K, Jahan T had involved in protocol preparation, data & sample collection and literature search and manuscript writing. Jahan T, Haque MS, Bhuiyan IA, Zohora FT were involved in manuscript preparation and revision. All the authors have read and approved the final version of the manuscript.

Data Availability

The datasets used and analyzed during the present study are derived from hospital surveillance systems and DGHS databases. Data are available from the corresponding author upon reasonable request and subject to approval by the relevant institutional authorities.

Ethics Approval and Consent to Participate

Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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