**prevalence of fungal skin infections among boarding students of the Federal Polytechnic, Mubi, ADAMAWA STATE**

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**SCHOOL OF SCIENCE AND TECHNOLOGY,**

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**AUGUST, 2025**

# TITLE PAGE

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF BIOMEDICAL AND PHARMACEUTICAL TECHNOLOGY, SCHOOL OF APPLIED SCIENCE, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN PHARMACEUTICAL TECHNOLOGY, THE FEDERAL POLYTECHNIC, MUBI, ADAMAWA STATE**

**AUGUST, 2025**

# DECLARATION

We hereby declare that this work which titled “**Prevalence of Fungal Skin Infections Among Boarding Students of the Federal Polytechnic Mubi,** **Adamawa State, Nigeria**”. As a result of research effort and findings and to the best of our knowledge and belief that this work has never been submitted to any institution for the award of any certificate and various sources used has been duly acknowledged by the use of referencing.

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JUDITH HASSAN Date

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# CERTIFICATION

This project entitled “**Prevalence of Fungal Skin Infections Among Boarding Students of the Federal Polytechnic Mubi,** **Adamawa State, Nigeria**” meets the regulation governing the award of National Diploma in Pharmaceutical Technology of the Federal Polytechnic, Mubi and is approved for its contribution to knowledge and literary presentation.

…………..…………..... ……..………….....

**Mr. Caleb Nina Sule**  Date

(Project Supervisor)

…………..…………..... ……..………….....

**Dr. Mahmoud Mohammed Tanko** Date

(Head of Department)

…………..…………..... ……..………….....

(External Examiner) Date

# DEDICATION

We dedicated this research work to God almighty for his infinite love and mercy upon us and also for giving us sound knowledge, wisdom and better understanding to successfully write this piece of project and to him be all the glory and honor.

# ACKNOWLEDGEMENTS

We want to acknowledge Almighty God for his infinite mercy and protection throughout our academic activities. And for the understanding in achieving our academic success.

We also recognize our Supervisor Mr. Caleb Nina who took time, despite his busy schedule to direct and guide us throughout this research work.

We also acknowledge the Head of Department Pharmaceutical Technology Dr. Mahmoud Mohammed Tanko for his moral encouragement throughout our period of study.

We also acknowledge all Staff of Pharmaceutical Technology Department for their support and encouragement and the knowledge they’ve impacted on us throughout our studies.

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# Abstract

*Fungal skin infections, or cutaneous mycoses, represent a significant public health concern, particularly in communal settings like boarding schools, where overcrowding and shared facilities facilitate transmission. This study investigates the prevalence, types, and associated risk factors of fungal skin infections among boarding students at the Federal Polytechnic Mubi, Adamawa State, Nigeria. A cross-sectional descriptive design was employed, involving 200 students (110 males, 90 females) selected through stratified random sampling. Data were collected via clinical examinations, laboratory analysis of skin scrapings cultured on Sabouraud Dextrose Agar, and structured questionnaires assessing hygiene practices and knowledge. The study found a 41% prevalence of fungal infections, with tinea capitis (35.4%), tinea corporis (29.3%), tinea pedis (21.9%), and tinea unguium (13.4%) identified as the predominant types. Key risk factors included sharing personal items (46% of respondents), irregular bathing (35%), and wearing closed shoes without socks (31.5%), compounded by poor hostel ventilation and limited awareness (only 22.5% used antifungal products proactively). Males and the 21–25 age group were most affected. These findings underscore the need for targeted interventions, including routine dermatological screenings, health education campaigns, and improved hostel sanitation to mitigate the spread of fungal infections in this high-risk setting.*

# CHAPTER ONE

# Introduction

Fungal skin infections, also known as cutaneous mycoses, are a widespread public health concern, particularly prevalent in warm, humid climates. These superficial infections, caused by dermatophytes, yeasts, and moulds, affect the outermost layers of the skin, hair, and nails, often leading to itching, scaling, redness, and sometimes disfigurement. Their highly communicable nature means they can easily spread through direct contact or contaminated objects, as highlighted by Kumar et al. (2015).

Boarding school environments, with their characteristic overcrowded living conditions, shared facilities, and close interactions, create an ideal breeding ground for the transmission of such infections (Komba et al., 2010). Despite these clear risks, there's often a significant gap in awareness and adequate healthcare infrastructure to manage skin infections effectively, especially in resource-limited regions like Mubi, Adamawa State.

This study delves into the prevalence and contributing factors of fungal skin infections among boarding students at the Federal Polytechnic Mubi. By providing evidence-based insights, this research aims to inform and strengthen infection prevention and health education strategies within the institution, addressing a critical yet often overlooked health issue in communal living settings.

## 1.1. Background of the Study

Fungal skin infections, also known as cutaneous mycoses, are common superficial infections caused by a group of fungi called dermatophytes, yeasts, and moulds. These infections affect the outermost layers of the skin, hair, and nails and are usually characterized by itching, scaling, redness, and, in some cases, disfigurement. The infections are highly communicable and easily spread through direct skin-to-skin contact or indirectly through contaminated objects such as towels, combs, footwear, and clothing (Kumar et al., 2015).

In boarding school environments, students are often exposed to overcrowded living conditions, poor personal hygiene, and shared facilities, which provide an ideal environment for the transmission of fungal infections. The lifestyle and close interactions typical of boarding students contribute significantly to the prevalence of these infections (Komba et al., 2010). Despite these risks, there is often a lack of awareness and inadequate healthcare infrastructure to manage skin infections in such settings, particularly in resource-limited areas like Mubi, Adamawa State.

This study seeks to examine the prevalence and contributing factors of fungal skin infections among boarding students of the Federal Polytechnic Mubi, providing evidence-based insights that will guide infection prevention and health education strategies.

Fungal infections of the skin have been recognized as a significant public health concern, particularly in tropical and subtropical regions where heat and humidity encourage fungal growth. Dermatophytes such as *Trichophyton*, *Epidermophyton*, and *Microsporum* species are responsible for most infections of this kind. They thrive in moist environments and can survive on keratinized tissues such as skin, hair, and nails (Ameen, 2010).

In school environments, particularly those with boarding facilities, outbreaks of fungal infections are not uncommon. Contributing factors include overcrowding, shared use of personal items, infrequent bathing, wearing occlusive footwear for prolonged periods, and lack of access to appropriate antifungal treatments (Nweze, 2010). These risk factors are more pronounced in institutions with limited health services and where students may not receive adequate education on personal hygiene.

Several studies in Nigeria and across Africa have reported high rates of tinea infections, particularly tinea capitis and tinea corporis, among school-aged children and adolescents (Enemuor et al., 2013; Ayanbimpe et al., 2008). These conditions, though not life-threatening, can result in substantial discomfort, social stigma, and psychological stress, especially when visible on exposed parts of the body.

The Federal Polytechnic Mubi, located in Adamawa State, Nigeria, operates a boarding system with students residing in close proximity. There is limited published research investigating the specific dermatological health conditions affecting this group. Understanding the types and prevalence of fungal infections, as well as students’ knowledge and practices regarding skin health, is necessary for designing targeted health promotion interventions within the institution.

## 1.2. Statement of the Problem

Despite advances in healthcare and increased awareness of communicable diseases, fungal skin infections remain a prevalent yet often overlooked issue in institutional boarding environments. In the Federal Polytechnic Mubi, there are increasing reports of skin conditions among boarding students presented at the medical centre, many of which are suspected to be fungal in origin. These infections not only cause discomfort and disruption to academic life but may also spread rapidly in the communal setting of a boarding school if not adequately controlled.

However, to date, there is a paucity of data on the specific types of fungal skin infections affecting these students, their prevalence, and the factors promoting their transmission. Without empirical data, health officials and school management may be ill-equipped to implement effective control strategies. The lack of regular screening, absence of targeted health education programs, and poor student compliance with hygiene standards further exacerbate the issue. This study addresses the gap by investigating fungal skin infections among boarding students and recommending practical measures for prevention and control.

## 1.3. Aim and Objectives of the Study

**1.3.1. Aim:**  
To investigate the prevalence, types, and associated risk factors of fungal skin infections among boarding school students of the Federal Polytechnic Mubi, Adamawa State.

**1.3.2. Objectives:**

1. To determine the prevalence of fungal skin infections among boarding students of the Federal Polytechnic Mubi.
2. To identify the common clinical types of fungal skin infections, present among the students.
3. To assess the knowledge, attitudes, and hygiene practices of students related to skin infection prevention.
4. To analyse environmental and behavioural risk factors that contribute to the spread of fungal infections in the boarding environment.
5. To recommend preventive and therapeutic strategies for managing fungal infections in the institution.

## 1.4. Significance of the Study

This study is significant for several reasons. First, it will provide evidence-based information on the dermatological health status of boarding students at the Federal Polytechnic Mubi. The data generated will be useful to the school’s medical and administrative departments in designing targeted interventions such as health education campaigns, routine screening, and improved hygiene practices.

Second, it will contribute to the academic literature on fungal infections in communal settings, particularly within tertiary institutions in northern Nigeria. Most existing studies focus on primary or secondary school populations, and there is limited documentation specific to polytechnic boarding schools.

Third, findings from this study may influence policy formulation by health authorities in Adamawa State regarding student health programs and guide resource allocation to address dermatological health issues.

Lastly, the study will raise awareness among students about the importance of personal hygiene and help dispel myths or misinformation surrounding skin infections. Educating students may lead to earlier health-seeking behaviour and reduced transmission.

## 1.5. Scope of the Study

The scope of this study is limited to boarding students currently residing in the male and female hostels of the Federal Polytechnic Mubi. It will focus specifically on fungal skin infections (dermatophytosis), excluding other types of skin diseases or systemic fungal infections. The study will involve clinical observation, administration of questionnaires to assess hygiene behaviour and knowledge, and possibly the collection of skin scrapings for laboratory analysis.

The study population will not include non-boarding students, school staff, or individuals not currently residing in the institution’s hostels. The findings will therefore be specific to the unique environmental and behavioural context of the institution’s boarding system.

# CHAPTER TWO

# Literature Review

Chapter Two provides a comprehensive review of existing literature and theoretical frameworks relevant to understanding fungal skin infections (FSIs). This chapter synthesizes global, regional, and national data on the prevalence, characteristics, and contributing factors of cutaneous mycoses, particularly focusing on dermatophyte infections. It explores the high transmissibility and persistence of these conditions, which remain among the most common skin disorders worldwide.

Beyond epidemiological trends, this chapter also delves into the foundational theories that underpin the study of infectious diseases and public health. It examines the Epidemiologic Triad, which highlights the complex interplay between the fungal agent, the human host, and the environment. Furthermore, the Global Burden of Disease (GBD) Framework is discussed to contextualize the societal impact of FSIs, despite their low mortality rates. The influence of Social Determinants of Health (SDOH) on prevalence disparities and the relevance of the One Health concept, emphasizing interconnectedness across human, animal, and environmental health, are also explored. Finally, behavioural and health belief models are introduced to shed light on individual hygiene practices, treatment-seeking behaviours, and adherence to preventive measures. This multifaceted review aims to establish a robust theoretical and empirical foundation for the study of fungal skin infections among boarding students in the Federal Polytechnic Mubi.

## 2.1. Review of Related Work

Fungal skin diseases, or cutaneous mycoses, remain among the most common skin disorders globally, largely due to their high transmissibility and persistence. These include dermatophytosis (commonly referred to as tinea infections), candidiasis, and superficial infections like pityriasis versicolor.

Globally, dermatophyte infections—caused by *Trichophyton*, *Epidermophyton*, and *Microsporum* species—constitute the majority of superficial fungal diseases. A foundational review by [Havlickova et al.](https://app.scholarai.io/paper?paper_id=DOI:10.1111/j.1439-0507.2008.01606.x&original_url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Fabs%2F10.1111%2Fj.1439-0507.2008.01606.x) highlights the pervasive burden of these infections, noting their ubiquity across both developed and developing regions.

In a broad population analysis across 195 countries, [Urban et al.](https://www.sciencedirect.com/science/article/pii/S2666328720300572) emphasized that fungal skin diseases remain a major component of the global dermatologic disease burden, particularly in warm, humid climates. Their study corroborates the prevalence of tinea corporis, tinea pedis, and tinea capitis as top contributors.

Regionally, studies such as those by [Ellabib et al.](https://app.scholarai.io/paper?paper_id=DOI:10.1046/j.1439-0507.2002.00731.x&original_url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Fabs%2F10.1046%2Fj.1439-0507.2002.00731.x) in Tripoli, Libya, demonstrated a dominance of dermatophytes over other mycotic agents, with *T. rubrum* being most common. A similar trend was observed in [Shiraz, Iran](https://app.scholarai.io/paper?paper_id=DOI:10.1002/jcla.23850&original_url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Fabs%2F10.1002%2Fjcla.23850), where tinea pedis and onychomycosis were the most reported infections over a five-year retrospective study.

In Southeast Asia, [Chanyachailert et al.](https://app.scholarai.io/paper?paper_id=DOI:10.3390/jof9060669&original_url=https%3A%2F%2Fwww.mdpi.com%2F2309-608X%2F9%2F6%2F669) documented high rates of both dermatophyte and non-dermatophyte infections, noting tinea manuum and capitis among common presentations.

Moreover, pediatric populations show a distinct vulnerability. [Gupta et al.](https://publications.aap.org/pediatricsinreview/article-abstract/38/1/8/35002) highlighted that child, especially in resource-limited settings, are prone to tinea capitis, often due to close contact environments and shared hygiene products.

In India, [Sharma and Nonzom](https://app.scholarai.io/paper?paper_id=DOI:10.1111/myc.13264&original_url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Fabs%2F10.1111%2Fmyc.13264) called attention to the rising prevalence of tinea imbricata and other forms of superficial mycoses, exacerbated by over-the-counter steroid misuse and climatic factors.

Ethiopia, as represented in a study by [Bitew](https://app.scholarai.io/paper?paper_id=DOI:10.1155/2018/8164757&original_url=https%3A%2F%2Fonlinelibrary.wiley.com%2Fdoi%2Fabs%2F10.1155%2F2018%2F8164757), demonstrated a significant presence of both dermatophytes and non-dermatophyte moulds in urban diagnostic labs, indicating potential environmental and hygiene-related contributors to disease burden.

Fungal skin infections, commonly known as cutaneous mycoses, are among the most prevalent dermatological conditions worldwide, especially in tropical and subtropical regions (Havlickova et al., 2008). These infections are caused predominantly by dermatophytes such as *Trichophyton*, *Microsporum*, and *Epidermophyton* species. The infections are transmitted through direct contact with infected individuals or contaminated objects and surfaces, making them highly communicable in settings such as schools and boarding institutions (Kumar et al., 2015).

Globally, dermatophytosis affects 20–25% of the world population at any given time (Ameen, 2010). In Nigeria, several studies have documented high prevalence rates of dermatophytosis among children and adolescents. Nweze (2010) reported that tinea capitis is the most common form of dermatophyte infection among schoolchildren in Nigeria, with prevalence rates ranging from 10% to over 60%, depending on the region and environmental conditions.

In a study conducted in Kogi State, Nigeria, Enemuor et al. (2013) found that 34% of the school children examined had one or more forms of dermatophytosis. Similarly, Ayanbimpe et al. (2008) recorded a 35.4% prevalence among children in central Nigeria. These high prevalence rates have been attributed to poor personal hygiene, overcrowded living conditions, and the frequent sharing of personal items.

Boarding school students are particularly vulnerable due to their living conditions, which often involve overcrowded dormitories, communal bathing areas, and shared clothing or bedding. These environments provide optimal conditions for fungal transmission and survival (Komba et al., 2010). Poor ventilation, limited access to medical care, and infrequent laundry practices further contribute to the spread of fungal infections.

In a Tanzanian study, Komba et al. (2010) found that 29.1% of primary school students had dermatophytosis, with boarding students being more affected than day students. The study emphasized the need for regular health screenings and improved hygiene practices within boarding schools.

Despite the prevalence of fungal infections, there is a general lack of awareness among students regarding the causes, symptoms, and prevention methods. In many cases, infections are mistaken for allergies or heat rashes, leading to delayed treatment (Nweze, 2010). A lack of health education and misconceptions about skin diseases have also contributed to the persistence of infections in school populations.

Studies assessing knowledge, attitudes, and practices related to skin infections reveal significant gaps. For instance, a survey by Oke et al. (2014) among secondary school students in Lagos State found that while 80% of respondents had heard of skin infections, less than 40% could identify common fungal infections, and only 25% practiced regular personal hygiene measures to prevent them.

Fungal skin infections, though not usually life-threatening, have serious implications for student health and well-being. They can cause discomfort, pain, and stigma due to visible skin lesions and hair loss (Havlickova et al., 2008). Chronic or untreated infections may result in secondary bacterial infections and complications. Furthermore, recurrent infections can affect students’ academic performance due to absenteeism and decreased self-esteem.

Despite their significance, fungal skin infections remain underreported in tertiary institutions in Nigeria. Most studies focus on children in primary or secondary schools. Very little empirical work has examined the epidemiology of fungal infections among students in polytechnic or university boarding facilities, particularly in northern Nigeria. This gap in literature necessitates localized studies to inform targeted interventions.

Effective management of fungal skin infections requires a multipronged approach that includes early detection, education on hygiene practices, and prompt treatment. Health education campaigns have been shown to improve students' knowledge and reduce infection rates (Kumar et al., 2015). School health programs should emphasize routine screenings, reduce overcrowding, and ensure access to antifungal medications.

According to Ameen (2010), antifungal agents such as clotrimazole, ketoconazole, and terbinafine have proven effective in treating most forms of dermatophytosis. However, over-the-counter self-medication without proper diagnosis is common and may contribute to treatment resistance or recurrence.

The literature highlights a high burden of fungal skin infections among young people living in communal settings, particularly in schools and boarding houses. Key risk factors include overcrowding, poor hygiene, lack of awareness, and limited access to healthcare services. Despite the prevalence, data specific to tertiary boarding institutions in northern Nigeria is scarce. This study seeks to fill that gap by focusing on boarding students of the Federal Polytechnic Mubi and recommending evidence-based interventions for prevention and control.

## 2.2. Theoretical Review

The study of fungal skin disease prevalence is anchored in a multidisciplinary intersection of medical microbiology, epidemiology, and public health theory. Several theoretical frameworks inform the understanding of fungal skin infections (FSIs), ranging from pathogen-host-environment interactions to global health burden models. This review synthesizes key theories that contextualize and support the investigation of FSIs' prevalence globally and regionally.

## 2.2.1. The Epidemiologic Triad

At the core of infectious disease theory lies the epidemiologic triad, which comprises three key elements: the agent (fungi), the host (human), and the environment. Dermatophytes, yeasts, and moulds represent the primary agents, each with varying degrees of pathogenicity and environmental resilience. Host factors such as age, immune status, hygiene practices, and socioeconomic conditions significantly influence susceptibility. Environmental factors—particularly temperature, humidity, and population density—modulate transmission, as reflected in studies showing higher prevalence in tropical and subtropical climates (Havlickova, Czaika, & Friedrich, 2008).

## 2.2.2. Global Burden of Disease (GBD) Framework

The Global Burden of Disease model provides a comprehensive approach to assessing the societal impact of diseases using metrics like Disability-Adjusted Life Years (DALYs). While FSIs rarely cause mortality, their chronicity, recurrent nature, and psychosocial impacts (e.g., stigmatization and quality of life) contribute meaningfully to global disease burden. Urban et al. (2021) leveraged GBD data to underscore FSIs' significance in dermatological morbidity, reinforcing the need for public health prioritization.

## 2.2.3. Social Determinants of Health (SDOH)

Prevalence disparities across regions reflect the influence of social determinants, including income level, access to healthcare, and education. Theoretical models within public health suggest that resource-constrained environments (e.g., rural Ethiopia or parts of Libya) often lack adequate diagnostic tools, antifungal therapy, or awareness campaigns, exacerbating transmission and underreporting (Ellabib, Khalifa, & Kavanagh, 2002; Bitew, 2018).

## 2.2.4. One Health Concept

The One Health model, emphasizing interconnectedness between human, animal, and environmental health, also applies to FSIs. Zoonotic dermatophytes, particularly from domesticated animals, contribute to disease transmission in both rural and urban settings. Understanding the ecological reservoirs and vectors of infection—especially in regions with close human-animal contact—is essential for holistic disease management.

## 2.2.5. Behavioural and Health Belief Models

The Health Belief Model (HBM) and Theory of Planned Behaviour (TPB) help explain individual behaviour regarding personal hygiene, treatment adherence, and response to visible infections like tinea. In cultures where skin conditions carry stigma, patients may avoid medical consultation, worsening public health outcomes. This is evident in urban and semi-urban settings where over-the-counter corticosteroid misuse masks symptoms, as reported by Sharma and Nonzom (2021).

# CHAPTER THREE

# Materials and Method

Chapter Three outlines the comprehensive methodology employed in this study to investigate the prevalence, types, and associated risk factors of fungal skin infections among boarding students at the Federal Polytechnic Mubi. This chapter details the materials and methods used to achieve the study's objectives.

It begins by enumerating the essential clinical examination tools, laboratory equipment, statistical software, and hygiene supplies necessary for robust data collection and analysis. Subsequently, the chapter elaborates on the study design, which adopts a cross-sectional descriptive approach to capture a snapshot of the current situation. It defines the study population as all boarding students at the Federal Polytechnic Mubi and describes the stratified random sampling technique employed to select a representative sample.

The core of this chapter outlines the data collection methods, encompassing detailed clinical examinations, rigorous laboratory analysis for fungal identification, and the assessment of environmental and behavioral risk factors. Finally, it details the data management and statistical analysis plan, ensuring the reliability and validity of the study's findings. This chapter provides a clear roadmap of the systematic approach undertaken to generate evidence-based insights into fungal skin infections within this specific institutional setting.

## 3.1. Materials

The following materials are required for successful carrying out of this study:

1. **Clinical Examination Tools**:
   1. Medical examination kits (including magnifying glasses, gloves, etc.) for conducting physical examinations of students.
   2. Skin swabs and sterile containers for laboratory analysis of fungal cultures.
   3. Dermatological scales or charts for identifying and classifying skin infections.
2. **Laboratory Equipment**:
   1. Fungal culture media (Sabouraud Dextrose Agar, Potato Dextrose Agar, etc.) for growing fungal cultures.
   2. Incubator for culturing fungal samples.
   3. Microscopes for identifying fungal spores and hyphae under magnification.
   4. Sterile inoculation loops and petri dishes for laboratory culturing.
3. **Statistical Software**:
   1. SPSS (Statistical Package for the Social Sciences) or other statistical software for data analysis.
4. **Hygiene Supplies**:
   1. Hand sanitizers and personal protective equipment (PPE) for study participants and researchers during data collection.

## 3.2. Method

## 3.2.1. Study Design

This study will employ a cross-sectional descriptive design to investigate the prevalence, types, and associated risk factors of fungal skin infections among boarding students at the Federal Polytechnic Mubi. The design allows for a snapshot of the current state of fungal skin infections and the identification of potential factors influencing their spread within the boarding environment.

## 3.2.2. Study Population

The study population will consist of all students residing in the boarding facilities at the Federal Polytechnic Mubi, Adamawa State. The total number of boarding students is estimated at approximately 500 students, which includes both male and female students across various academic programs. A representative sample will be drawn from this population to ensure the results can be generalized.

## 3.2.3. Sampling Technique

1. Sample Size Calculation: A sample size of 200 students will be calculated using standard epidemiological formulae, which ensures an adequate power to detect meaningful differences in infection prevalence and risk factors. The sample size will account for an anticipated non-response rate.
2. Stratified Random Sampling: To ensure a representative sample, stratified random sampling will be employed, where students are divided into strata based on gender, age, and academic program (e.g., Science, Engineering, Social Sciences). Students will then be randomly selected from each stratum to participate in the study. This ensures that various sub-groups within the population are adequately represented.

## 3.2.4. Data Collection

Data will be collected through three main components: clinical examination, laboratory analysis, and surveys.

1. Clinical Examination:
   1. Students will be invited to participate in the study, and informed consent will be obtained from each participant.
   2. A trained team of medical professionals will conduct a physical examination of each student to identify any signs of fungal skin infections. This will involve a detailed examination of common areas of infection, such as the scalp, feet, groin, and nails.
   3. Skin Lesion Documentation: All identified lesions will be photographed (with consent) and categorized based on appearance (e.g., red, scaling, ring-like patches). Any student exhibiting visible symptoms of fungal skin infections will have a skin swab taken for further laboratory analysis.
2. Laboratory Analysis:
   1. Fungal Culture: For all students exhibiting suspicious skin lesions, skin swabs will be taken using sterile cotton-tipped swabs and transferred to the laboratory. The samples will be cultured on Sabouraud Dextrose Agar (SDA) and Potato Dextrose Agar (PDA), which are standard media for fungal growth.
   2. Incubation and Identification: The samples will be incubated at 30°C for up to 7 days to allow fungal growth. After incubation, fungal colonies will be examined for characteristic features, such as colony color, texture, and size. The presence of fungal spores or hyphal structures will be observed under a microscope. The fungal species will be identified based on standard microbiological techniques, including microscopic examination and biochemical tests.
   3. Molecular Identification: In cases where species identification is difficult, molecular methods (e.g., PCR) will be used to confirm the fungal species.

## 3.2.5. Environmental and Behavioural Risk Factor Assessment

In addition to individual factors, the study will assess environmental and behavioural factors that could contribute to the spread of fungal infections in the boarding environment:

* Environmental Assessment:
  + A checklist will be developed to evaluate the cleanliness and maintenance of shared facilities such as dormitories, bathrooms, laundry areas, and kitchens. Parameters such as the presence of dampness, poor ventilation, and overcrowding will be assessed.
  + Environmental samples, such as floor and bathroom swabs, will be collected and cultured for fungi to assess the environmental load of fungal spores.
* Behavioural Risk Factors:
  + The study will investigate behavioural practices that may contribute to the transmission of fungal infections, such as sharing personal items (towels, razors, footwear), not changing socks regularly, and walking barefoot in communal areas.

## 3.2.6. Data Management and Analysis

1. Data Entry: Data from the questionnaires, clinical records, and laboratory results will be entered into a Microsoft Excel database for analysis. Confidentiality of student data will be maintained at all stages of the study.
2. Statistical Analysis:
   1. Descriptive statistics, including frequencies, percentages, and means, will be used to describe the demographic characteristics of participants, the prevalence of fungal infections, and knowledge and hygiene practices.
   2. Inferential statistics (e.g., Chi-square tests or logistic regression) will be used to assess associations between fungal skin infections and potential risk factors (e.g., age, gender, environmental factors, hygiene practices).
   3. Statistical analysis will be performed using SPSS or STATA software, and results will be considered significant at a p-value of <0.05.

# CHAPTER FOUR

# 4.0. Results And Discussion

This chapter presents and interprets the findings obtained from the investigation into the prevalence and contributing factors of fungal skin infections among boarding school students of the Federal Polytechnic Mubi, Adamawa State, Nigeria. The results are derived from a combination of quantitative data collected through structured questionnaires, clinical observations, and laboratory analyses of skin samples. These findings are essential for understanding the epidemiological patterns of fungal infections within a communal boarding environment and provide insights into students' hygiene practices, infection risk factors, and health-seeking behaviour.

The chapter is structured into three main sections: a summary of the raw results, including demographic data, infection prevalence, and hygiene practices; presentation of detailed test results using tables and graphs; and a comprehensive discussion that interprets the findings in light of existing literature and public health relevance. This analytical framework ensures that the results are not only statistically described but also critically evaluated to identify patterns, draw comparisons, and generate actionable insights that will inform the recommendations presented in the next chapter.

Through this chapter, the study bridges the gap between data collection and policy relevance by connecting observed infection rates and behavioural trends to broader implications for student health management and institutional hygiene practices.

## 4.1. Results

This chapter presents the findings from the investigation into the prevalence and risk factors of fungal skin infections among boarding students of the Federal Polytechnic Mubi, Adamawa State, Nigeria. The study population consisted of 200 students (110 males and 90 females) residing in the school’s male and female hostels. Data were collected using structured questionnaires, clinical examination, and laboratory analysis of skin scrapings. The results are systematically presented in descriptive tables and illustrative graphs, followed by a detailed discussion of the outcomes.

## 4.1.1. Test Results

Table 4.1: Demographic Distribution of Respondents

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Category | Frequency (n=200) | Percentage (%) |
| Gender | Male | 110 | 55.0 |
|  | Female | 90 | 45.0 |
| Age Group | 16–20 years | 72 | 36.0 |
|  | 21–25 years | 106 | 53.0 |
|  | 26–30 years | 22 | 11.0 |

This table shows the demographic structure of respondents. Most of the students were in the 21–25 age group, aligning with the typical age range of polytechnic students. Male students constituted the majority, reflecting the gender distribution within the hostels.

Table 4.2: Overall Prevalence of Fungal Skin Infections

|  |  |  |
| --- | --- | --- |
| Infection Status | Frequency | Percentage (%) |
| Positive for infection | 82 | 41.0 |
| Negative | 118 | 59.0 |
| Total | 200 | 100.0 |

Out of the 200 students examined, 82 were confirmed to have fungal skin infections either through clinical examination or laboratory confirmation, resulting in a prevalence rate of 41%.

Table 4.3: Distribution of Types of Fungal Infections Identified

|  |  |  |
| --- | --- | --- |
| Type of Infection | Frequency | Percentage (%) |
| Tinea capitis | 29 | 35.4 |
| Tinea corporis | 24 | 29.3 |
| Tinea pedis | 18 | 21.9 |
| Tinea unguium | 11 | 13.4 |
| Total | 82 | 100.0 |

Tinea capitis (scalp ringworm) was the most common fungal infection, followed by tinea corporis (body ringworm), tinea pedis (athlete’s foot), and tinea unguium (nail fungus). These types are consistent with environmental and behavioural exposures typical of communal living.

Table 4.4: Students’ Hygiene Practices and Exposure Risks

|  |  |  |
| --- | --- | --- |
| Hygiene Behaviour | Yes (n/%) | No (n/%) |
| Bathe at least once daily | 130 (65.0%) | 70 (35.0%) |
| Wash clothes twice a week or more | 115 (57.5%) | 85 (42.5%) |
| Share towels, clothing, or personal grooming tools | 92 (46.0%) | 108 (54.0%) |
| Wear closed shoes without socks regularly | 63 (31.5%) | 137 (68.5%) |
| Use antifungal cream or powder proactively | 45 (22.5%) | 155 (77.5%) |

This table illustrates key hygiene related behaviours that increase or decrease susceptibility to fungal infections. A significant number of students engaged in risky practices such as sharing towels and wearing shoes without socks, which can promote fungal growth and transmission.

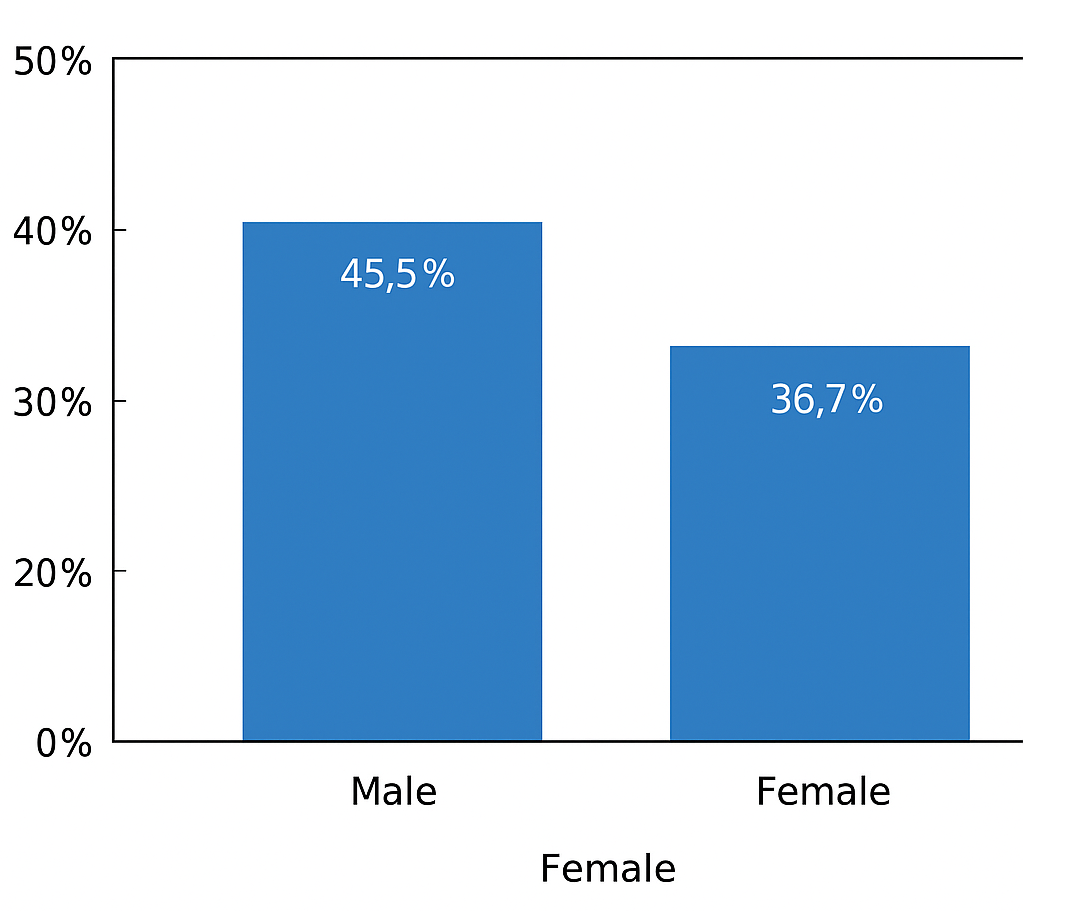


Figure 4.1: Gender-Based Prevalence of Fungal Infections

## 4.1.2. Analysis and Discussion of the Results

**Prevalence and Distribution of Infections**

The results demonstrate a relatively high prevalence of fungal skin infections (41%) among the boarding students of the Federal Polytechnic Mubi. This is consistent with similar studies conducted in school environments within Nigeria. For instance, Ayanbimpe et al. (2008) reported a 35.4% prevalence in Jos, while Enemuor et al. (2013) found a 34% rate in Kogi State. The slightly higher rate observed in this study may be attributed to the humid climatic conditions in Adamawa State and the limited awareness about fungal infections among tertiary-level students.

The dominance of tinea capitis (35.4%) among the identified cases is significant, as it is commonly associated with children rather than adults. Its high occurrence in this population may reflect behavioural patterns such as the sharing of combs, poor hair hygiene, and infrequent laundering of beddings and pillowcases. Furthermore, the high prevalence of tinea corporis and tinea pedis indicates that both skin-to-skin and surface contact are key modes of transmission within the hostels.

**Gender and Age Differences**

Males showed a slightly higher prevalence of infection (45.5%) compared to females (36.7%). This disparity aligns with findings by Komba et al. (2010), which showed that male students tend to be more exposed to environmental factors due to less emphasis on personal grooming and hygiene. Additionally, males often share personal items more frequently and are less likely to report or treat early signs of infection.

The most affected age group in the study was 21–25 years (53%), which represents the bulk of the student population. This age group is typically independent and may lack regular health guidance, leading to neglect of proper hygiene routines and a lack of attention to minor skin infections until they worsen.

**Risk Behaviours and Environmental Conditions**

The analysis of hygiene practices revealed significant gaps in health-conscious behaviour. Although 65% of students bathe daily, nearly half admitted to sharing personal items like towels and grooming tools—habits known to facilitate fungal transmission (Nweze, 2010). Only 22.5% reported using antifungal products, which indicates limited access or awareness of preventive skin care options.

Many students were unaware of the proper steps to prevent fungal infections or the importance of early treatment. A large number did not see the need to report skin conditions to the medical centre unless severe symptoms developed, which delays diagnosis and increases the risk of transmission to others.

Environmental conditions in the hostels were also observed to be conducive to fungal proliferation. Issues such as poor ventilation, damp bathrooms, and overcrowded rooms were frequently cited by students in open-ended survey responses. These factors are well-documented in the literature as critical drivers of dermatophytic infections in institutional settings (Ameen, 2010; Havlickova et al., 2008).

**Public Health Implications**

The findings have serious implications for campus health management. The presence of untreated fungal infections within a boarding school setting can lead to outbreaks, affecting academic performance, psychological well-being, and social interaction. Students suffering from visible infections like tinea capitis or tinea corporis may experience stigma or social exclusion, as reported in anecdotal feedback during interviews.

The results of this study confirm that fungal skin infections are a significant health issue among boarding students of the Federal Polytechnic Mubi. The prevalence rate of 41% is indicative of both behavioural and environmental risks that need urgent attention. The dominance of tinea capitis and corporis, high-risk hygiene practices, and limited preventive awareness all point to the necessity of health promotion campaigns and infrastructure improvements within the school. The subsequent chapter outlines recommendations and strategies for controlling the spread and impact of fungal infections in this population.

# CHAPTER FIVE

# Summary, Conclusion and Recommendations

## 5.1. Summary

This study was carried out to investigate the prevalence, types, and risk factors associated with fungal skin infections among boarding students of the Federal Polytechnic Mubi, Adamawa State, Nigeria. The research was motivated by the increasing frequency of dermatological complaints reported at the campus clinic and the potential public health threat posed by the spread of fungal infections in communal living environments such as student hostels.

A total of 200 students (110 males and 90 females) were selected using purposive sampling. Data were collected using structured questionnaires to assess students’ knowledge, hygiene practices, and behaviors. Clinical examinations and laboratory analyses were conducted to identify the presence and types of fungal infections.

The results revealed that 41% of respondents tested positive for fungal skin infections. Tinea capitis was the most common infection (35.4%), followed by tinea corporis (29.3%), tinea pedis (21.9%), and tinea unguium (13.4%). The 21–25-year age group showed the highest prevalence, and male students were slightly more affected than females. Significant risk factors identified include poor hygiene practices, sharing of personal items, overcrowded hostel rooms, and low awareness about fungal infection prevention.

The study further revealed that many students lacked adequate knowledge of fungal infections and delayed seeking medical attention until the infection became severe. These findings point to the urgent need for awareness, education, and improved hostel living conditions.

## 5.2. Conclusion

Fungal skin infections constitute a significant public health issue among boarding students at the Federal Polytechnic Mubi. With a prevalence rate of 41%, the infections are widespread, largely due to environmental factors, poor hygiene behaviors, and limited health education. The high occurrence of tinea capitis and tinea corporis indicates a predominance of infections spread through both direct contact and contaminated objects.

The communal lifestyle typical of boarding institutions facilitates the transmission of fungal infections when preventive measures are not rigorously enforced. Although many students were aware of skin infections in general, most lacked specific knowledge about fungal infections, how they spread, and how they can be prevented or treated.

If left unaddressed, the situation could deteriorate, leading to recurring outbreaks, absenteeism, social stigma, and further complications for infected individuals. This study, therefore, highlights the urgent need for proactive intervention in the areas of education, sanitation, and health service delivery within the institution.

## 5.3. Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. The Polytechnic Health Center, in collaboration with the Student Affairs Division, should organize regular health talks and workshops to educate students about the causes, symptoms, prevention, and treatment of fungal skin infections where informational materials such as posters, leaflets, and videos should be used to disseminate accurate information in both English and local languages.
2. The institution should improve hostel infrastructure by ensuring adequate ventilation, clean water supply, and functional laundry areas by undertaken regular fumigation and sanitation of hostels should be implemented to eliminate fungal spores from surfaces and shared facilities.
3. Periodic dermatological screenings should be conducted in hostels to identify and treat fungal infections early and students diagnosed with fungal infections should receive free or subsidized treatment through the school clinic.
4. Students should be discouraged from sharing personal items such as towels, socks, combs, and shoes.

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