



Distribution of Dermatophyte, Bacterial, Viral, and Parasitic Skin Infections among Children Attending Tertiary Health Institutions in Imo State, Nigeria: A Ten-Year Retrospective Record Review, 2015–2024

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Abstract

The distribution of groups of pathogens in childhood skin diseases can guide diagnostic capabilities, procurement of treatment and priorities in prevention. This study examined dermatophyte, bacterial, viral and parasitic skin illnesses seen among children attending some tertiary health facilities in Imo State, Nigeria. A retrospective cross-sectional audit of paediatric records from three referral centers between January 2015 and December 2024. Cases were eligible if there were records of children 0–15 years old with a proven skin illness. Frequencies and proportions among cases were determined, and hospital prevalence for each category was calculated using 17,200 paediatric attendance data as the basis. Differences from an equal-category distribution were examined with a chi-square goodness of fit test. Among the 391 skin illnesses recorded, the most frequent were dermatophyte infections (161; 41.2%) followed by bacterial (113; 28.9%), viral (75; 19.2%) and parasitic (42; 10.7%) infections. Corresponding prevalence estimates for all 17,200 paediatric attendance records were 0.94%, 0.66%, 0.44% and 0.24%. There was a non-proportional distribution across categories ($\chi^2=80.40$, $df=3$, $p<0.001$; Cohen's $w=0.453$). Dermatophyte infections were the most commonly reported paediatric skin infections, however, bacterial, viral and parasite diseases combined accounted for the majority of the cases. Fungal disease should be a priority in integrated surveillance and prevention, without abandoning antimicrobial stewardship, immunisation and control of transmissible infestations.

Keywords: Bacterial skin infections; children; dermatophytes; Imo State; parasitic infections; viral infections.

Introduction

Infectious skin illnesses are substantial causes of morbidity in children globally, especially in tropical and subtropical regions where environmental, socioeconomic and behavioural factors may contribute to transmission. Many childhood skin infections are not life threatening but can cause significant discomfort, pruritus, pain, inflammation, deformity, sleep disturbance, stigma, school absences and diminished quality of life[1]. Persistent or improperly managed infections may also lead to secondary problems such as bacterial superinfection, scarring, hair loss and recurring disease. Therefore, infectious dermatoses are not only a source of individual morbidity, but also contribute to healthcare usage and the public health burden of childhood illness[2].

Childhood skin infections epidemiology illustrates the combination of pathogen properties with host, environmental and societal variables. Climate is of particular importance in tropical settings, as high warmth and humidity may encourage the establishment and transmission of various fungal species. Crowding in households and schools may enhance person to person transmission. Low sanitation, lack of access to water, low health education and sharing of personal things may increase exposure. Moreover, the diagnosis and reporting of infections in formal health systems are impacted by healthcare-seeking behaviour, socioeconomic determinants, availability of diagnostic services and access to effective treatment. Thus, the prevalence seen in health care institutions may vary significantly from the real burden in the general community[3].

Dermatophytes are one of the primary fungal causes of skin disorders in children. These keratinophilic fungi infect keratin-containing tissue such as skin, hair and nails. The most prevalent dermatophyte infections are caused by the genera *Trichophyton*, *Microsporum* and *Epidermophyton*. Tinea capitis is especially a concern in youngsters affecting the scalp and hair and is easily transferred by intimate contact and sharing of combs, brushes, caps, towels, clothing, bedding, and hair-grooming implements[4]. Children in school and in crowded homes may be particularly vulnerable. Severe or chronic tinea capitis may also be accompanied by an inflammatory reaction leading to alopecia, kerion development, persistent scarring and sometimes inflammatory lesions. Such lesions are also visible, which may add to shame and social stigmatization[5].

Another prominent type of infectious dermatoses in children are bacterial infections of the skin. After the breach of skin barrier or directly transmitted between people, pyogenic diseases, such as impetigo, folliculitis, cellulitis and others, can arise. Poor cleanliness, overcrowding, trauma, insect bites, pre-existing skin illness and restricted access to proper treatment can encourage bacterial transmission or progression. One area of worry is the likelihood of antimicrobial resistance due to misuse of antibiotics or insufficient therapy. Therefore, accurate diagnosis and adequate antibiotic therapy are critical components of paediatric skin-health services[6].

Morbidity in childhood also include viral skin illnesses such as molluscum contagiosum, viral warts, herpesvirus-associated lesions and other viral dermatoses. Transmission may occur by direct skin-to-skin contact, infected items, respiratory or other pathways, depending on the pathogen. Some viral skin diseases are self limiting, but others may be recurring or associated with significant discomfort and psychosocial implications. Vaccination has an essential place in the prevention of certain viral infections with cutaneous symptoms, and is an example of the broader interaction between surveillance of paediatric skin disease and preventive health care[7].

Parasitic infestations, especially scabies, are another key component of infectious skin illness in children. Scabies is caused by *Sarcoptes scabiei* var. *hominis* and is usually transmitted by prolonged close contact. Transmission may be facilitated in crowded houses, schools, institutions and other environments where people come into frequent physical contact. Severe pruritus might interrupt sleep and cause excoriation. Scratching can predispose the affected youngster to subsequent bacterial infection. Effective control consequently needs not only treatment of individual patients but also adequate management of close relationships and attention to household and environmental factors[8].

Data from Nigeria show that infectious skin disorders are still frequent among children, however the published prevalence estimates vary widely according to the geographical region, study design, population characteristics, case definitions and diagnostic procedures. High loads of tinea capitis and other infectious dermatoses have been found in studies among kids in various sections of the country. For example, infectious dermatoses have been documented in elementary school students in South-Eastern Nigeria and studies from other parts of Nigeria have shown high prevalence of tinea capitis and dermatophytosis[9]. These findings indicate that childhood skin diseases are still significant to Nigerian public health but also indicate the need for generation of location-specific epidemiological data.

This distinction between community- and hospital-based prevalence is particularly essential in evaluating such information. The surveys actively screen children in schools and communities and can discover mild, untreated, or previously undiagnosed infections. Hospital records, by contrast, include children who have come into care and whose condition has been diagnosed and documented clinically. Children treated in the home, pharmacies, primary healthcare centers, private clinics or other healthcare settings may not appear in tertiary hospital records. Referral patterns may also result in tertiary institutions receiving a disproportionate percentage of severe, recurrent, unusual or treatment resistant cases. Hence, the rate of hospital attendance should be taken as a marker of recorded healthcare burden and not as a population prevalence estimate[10].

The relative importance of different categories of pathogen is very helpful when organising health services. A high fungal burden would underscore the necessity for adequate mycological diagnostic capacity and consistent supply of antifungal medications. A large bacterial load would underline the need for effective diagnosis, infection prevention and antibiotic stewardship. Viral skin diseases may be an opportunity for improving preventive measures and health education relating to vaccination where applicable while parasitic infestations need attention to early diagnosis, treatment of cases and contacts and household or environmental interventions. Thus, grouping of infectious skin disorders into main an etiological category might give useful information for clinical management, laboratory planning, surveillance and public health intervention [11].

Long-term evaluations of hospital records can add to our understanding of childhood skin infections by detailing the cumulative burden of reported disease over several years. Such information can help health care administrators and doctors plan for diagnostic services, drugs, staffing, health education and referral pathways. However, retrospective data should be interpreted in light of the constraints of existing documentation including missing records, alterations in diagnostic practice, changes in referral patterns and differences in record keeping systems across time [12].

Infectious skin illnesses are of great relevance among children. There is limited long-term hospital-based research on the distribution of dermatophyte, bacterial, viral and parasite skin infections in Imo State. The pattern of recorded infections in selected referral facilities can be a valuable foundation for healthcare planning and future epidemiological investigations.

Hence, this study examined the distribution of dermatophyte, bacterial, viral and parasitic skin illnesses observed among children attending selected tertiary health institutions in Imo State, Nigeria between January 2015 and December 2024. It also computed the hospital attendance-based prevalence of each category of infection during the ten year period of research, thereby providing a service-level estimate of the documented burden of childhood infectious skin disorders in the study environment.

Materials and Methods

Study Design and Setting

A retrospective cross-sectional record-review study was conducted in three referral healthcare facilities in Imo State, South-East Nigeria: Federal University Teaching Hospital, Owerri; Imo State University Teaching Hospital, Orlu; and a selected federal health facility in Okigwe. The study involved a review of eligible paediatric hospital records generated between 1 January 2015 and 31 December 2024, covering a ten-year period.

The participating facilities provide paediatric and other specialist healthcare services to residents of their respective catchment areas and receive referrals from primary and secondary healthcare facilities. The multicentre design was adopted to provide a broader assessment of documented childhood skin infections across different healthcare settings within the state.

Study Population and Case Eligibility

The source population comprised children aged 0–15 years with documented hospital attendances during the study period. A record was considered an eligible case if it contained a clearly documented diagnosis of a dermatophyte, bacterial, viral, or parasitic skin infection, together with sufficient demographic and diagnostic information for classification.

Records were excluded when they involved children outside the specified age range, presentations occurring outside the study period, duplicate records relating to the same clinical episode, or records that were illegible or materially incomplete such that the diagnosis or essential demographic information could not be reliably determined.

Ethical Considerations

Institutional permission to access the relevant records was obtained from the Ministry of Health Imo State. Because the study involved a retrospective, non-contact review of existing hospital records, a waiver of individual informed consent was sought from the appropriate institutional authorities/ethics committee.

Confidentiality of patient information was maintained throughout the study. Direct personal identifiers were excluded from the analytical dataset, and extracted information was used solely for the purposes of the research.

Data Collection and Classification

Data were abstracted by trained data collectors using a structured data-extraction form. Information was obtained from available outpatient registers, admission records, laboratory registers, clinical case records, and electronic medical records.

Variables extracted included healthcare facility, study identification code, age, sex, date of presentation, documented diagnosis, and causative organism where available. Direct personal identifiers were not entered into the analytical dataset.

For analysis, documented skin infections were classified into four mutually exclusive aetiological categories: dermatophyte, bacterial, viral, and parasitic infections. Each eligible case was assigned to the category corresponding to the documented diagnosis. Where a specific organism was recorded, this information was retained for descriptive purposes.

Statistical Analysis

Data were analysed using descriptive and inferential statistical approaches based on the aggregate records available for the study. Prevalence was expressed as the number of cases in each infection category divided by the total number of paediatric attendance records, multiplied by 100. Corresponding 95% confidence intervals (CIs) were calculated using the Wilson score method. All statistical tests were two-sided, and statistical significance was assessed at $p < 0.05$, where applicable.

Results

The dataset contained 391 documented paediatric skin-infection cases among 17,200 attendance records. Dermatophyte infections accounted for 41.2% of cases, bacterial infections 28.9%, viral infections 19.2%, and parasitic infections 10.7%. Although dermatophytes were the single largest category, the three non-dermatophyte categories together represented 58.8% of all cases.

Category	Cases, n	Share of cases, %	Hospital prevalence, %	95% CI
Dermatophyte infections	161	41.2	0.94	0.80–1.09
Bacterial infections	113	28.9	0.66	0.55–0.79
Viral infections	75	19.2	0.44	0.35–0.55
Parasitic infections	42	10.7	0.24	0.18–0.33
Total	391	100.0	2.27	2.06–2.51

Table 1. Distribution and hospital attendance-based prevalence of paediatric skin-infection categories, 2015–2024.

Under an equal-frequency descriptive null hypothesis (97.75 cases per category), the observed distribution differed significantly ($\chi^2=80.40$, $df=3$, $p<0.001$). Cohen's w was 0.453, conventionally a large departure from equal proportions. This analysis does not establish causation or compare category-specific population risks.

Discussion

Dermatophyte infections were the commonest single type of paediatric skin infections recorded in this investigation, comprising 41.2% of all cases detected. Their dominance is epidemiologically conceivable in a tropical setting such as Southeast Nigeria where moderate temperatures and relatively high humidity may create optimal circumstances for fungal development and transmission. Furthermore, close human contact and the sharing of personal things, including combs, towels, caps, clothing, bedding, and hair-cutting equipment, might promote the spread of dermatophytes. Close physical contact during play and school activities, establishment of personal hygiene habits, close interactions within the household, and delayed recognition or incomplete treatment of infection, may put children at increased risk of infection. Similarly previous Nigerian and African research have shown that dermatophytosis especially tinea capitis is a major source of childhood skin illness [14]

The high prevalence of dermatophyte infections has serious consequences for paediatric and laboratory services. Accurate diagnosis of superficial fungal infections is important, as many inflammatory or scaling skin disorders may share overlapping clinical characteristics. Where necessary, adequate mycological investigations can help to increase diagnostic certainty and guide judicious antifungal medication. There are powerful antifungal drugs and health education on personal hygiene and avoidance of shared grooming equipment may help to reduce transmission. However, because the present study is retrospective, it is not possible to evaluate whether environmental factors, hygiene practices, household congestion, or specific contact behaviours were responsible for the observed predominance[15].

The second largest group was bacterial infections, accounting for 28.9% of reported cases. Bacterial skin infections in childhood may be transmitted directly or following breakdown of the skin barrier. Minor trauma, insect bites, scratching of pruritic lesions and secondary infection of pre-existing dermatoses may offer opportunity for bacterial invasion. The relatively high number of bacterial infections found in this study emphasises the importance of adequate clinical assessment and when indicated microbiological examination particularly in severe, recurring, widespread or treatment-resistant infections. Antimicrobial selection is also crucial to avoid needless antibiotic exposure and support antimicrobial stewardship[16].

Viral infections comprised 19.2% of reported cases. Among the viral diagnoses, the accessible records identified illnesses such as chickenpox and measles. The occurrence of these disorders indicates the ongoing value of surveillance for childhood illness with fever or vesicular rash presentations. Routine immunisation, early detection of suspected vaccine preventable diseases, proper isolation where necessary and timely public health reporting are critical components of preventive and outbreak control. However, the study did not measure individual vaccination histories or immunisation coverage and hence the results cannot be used to predict vaccine uptake, vaccine effectiveness or immunisation gaps in a study population[17].

The least common of the four main groups was parasitic infections, which made up 10.7% of the recorded cases. Parasitic skin infections (scabies, pediculosis) are transmitted efficiently by contact, particularly in crowded houses,

schools and other collective settings. The intense pruritus associated with these situations may cause sleep disturbance, decreased concentration, excoriation and subsequent bacterial infection[18]. Tertiary hospitals reported considerably lesser proportion of parasitic infections which need not always be regarded as indication of low population burden. Some of the affected children may be treated at home, pharmacies, primary healthcare centers or other health care settings and hence may not be recorded in the tertiary hospital records[19].

The distribution described in this study favours an integrated approach to the control of the paediatric skin illness. "Dermatophyte infections are the most important, as this was the largest single category, meaning there is a huge need for proper fungal diagnosis, treatment, prevention and health education. Dermatophytes however, accounted for 41.2% of the cases. Hence, the total burden of bacterial, viral and parasite diseases was higher (58.8%). Therefore, a comprehensive control strategy should not be limited to fungal disease[20].

In the occurrence of bacterial infections emphasis should be given to proper antibiotic prescribing, infection prevention and microbiological examination of selected patients. Routine immunisation, early identification of probable vaccine preventable diseases and epidemic surveillance remain critical for viral infections[21]. Control programs should include early treatment of parasite infestations, management of close contacts, household level interventions and health education. Health education in schools and increased parental awareness might enable an earlier recognition and healthcare-seeking in all categories[22].

The findings further underscore the need for more routine reporting of paediatric skin disorders. Improved quality of future surveillance will be achieved through consistent diagnostic nomenclature and distinction between clinically suspected and laboratory-confirmed illnesses. Integration of hospital-based surveillance with periodic school- and community-based evaluations could provide a more full picture of illness burden, while preserving the critical distinction between prevalence based on hospital attendance and population prevalence.

Conclusion

Dermatophyte infections (41.2%) were the most common single category of paediatric skin illness in the selected tertiary healthcare facilities followed by bacterial infections (28.9%), viral infections (19.2%) and parasitic infections (10.7%). Hospital-based prevalence estimates of 0.94%, 0.66%, 0.44% and 0.24% for dermatophyte, bacterial, viral and parasitic infections respectively were derived from the study of 17,200 paediatric attendance data.

These data indicate that fungal infections are an important component of recorded paediatric skin disease in the study context, while the substantial combined burden of bacterial, viral and parasite infections point to the need for a wide and integrated public health response. Therefore control strategies should include improved fungal diagnosis and access to antifungals, antimicrobial stewardship, routine immunisation and rash-illness surveillance, management of parasitic infestations, school health education, contact management and promotion of adequate hygiene practices.

The study used retrospective tertiary-facility records; thus, the findings indicate documented hospital attendance-based burden rather than community prevalence. Further prospective school and community based research is necessary to determine the wider epidemiological burden, identify particular risk variables and guide targeted preventative and control intervention among children in Imo State.

References

1. Bongomin, F., Olum, R., Nsenga, L., Namusoby, M., Russell, L., de Sousa, E., Osaigbovo, I.I., Kwizera, R. & Baluku, J.B. (2021). Estimation of the burden of tinea capitis among children in Africa. *Mycoses*, 64(4), 349–363.
2. Muhammad, Y.A. (2022). Prevalence and pattern of paediatric dermatoses among children in Aminu Kano Teaching Hospital, Kano, Nigeria. *Acta Biomedica*, 93(1), e2022015.
3. Ewurum, O., Ibeneme, C.A., Nnaji, T.O., Ikefuna, A.N., et al. (2022). Spectrum of skin disorders among primary school children in Umuahia, South-East Nigeria. *Nigerian Journal of Clinical Practice*, 25(7), 1076–1082.
4. Gibbs, S. (1996). Skin disease and socioeconomic conditions in rural Africa. *Tropical Doctor*, 26(1), 15–20.
5. Oduko, O.M., Onayemi, O. & Oyediji, G.A. (2001). A prevalence survey of skin diseases in Nigerian children. *Nigerian Journal of Medicine*, 10(2), 64–67.
6. Sladden, M.J. & Johnston, G.A. (2005). More common skin infections in children. *BMJ*, 330(7501), 1194–1198.
7. Altraide, D.D., George, I.O. & Frank-Briggs, A.I. (2008). Prevalence of skin diseases in Nigerian children—the University of Port Harcourt Teaching Hospital experience. *Nigerian Journal of Medicine*, 17(4), 417–419. <https://doi.org/10.4314/njm.v17i4.37424>
8. Ngwogu, A.C. & Otokunfor, T.V. (2007). Epidemiology of dermatophytoses in a rural community in Eastern Nigeria and review of literature from Africa. *Mycopathologia*, 164(4), 149–158. <https://doi.org/10.1007/s11046-007-9038-3>
9. Ogunbiyi, A.O., Owoaje, E.T. & Ndahi, A. (2005). Prevalence of skin disorders in school children in Ibadan, Nigeria. *Pediatric Dermatology*, 22(1), 6–10.

10. Nweze, E.I. & Okafor, J.I. (2005). Prevalence of dermatophytic fungal infections in children: a recent study in Anambra State, Nigeria. *Mycopathologia*, 160(3), 239–243.
11. Popoola, T.O.S., Ojo, D.A. & Alabi, R.O. (2006). Prevalence of dermatophytosis in junior secondary schoolchildren in Ogun State, Nigeria. *Mycoses*, 49(6), 499–503.
12. Hogewoning, A.A., Adegnika, A.A., Bouwes Bavinck, J.N., Yazdanbakhsh, M., Kremsner, P.G., van der Raaij-Helmer, E.M.H., Staats, C.C.G., Willemze, R. & Lavrijsen, A.P.M. (2011). Prevalence and causative fungal species of tinea capitis among schoolchildren in Gabon. *Mycoses*, 54(5), e354–e359.
13. Ayanlowo, O., Akinkugbe, A., Oladele, R. & Balogun, M. (2014). Prevalence of tinea capitis infection among primary school children in a rural setting in south-west Nigeria. *Journal of Public Health in Africa*, 5(1), 349.
14. Kalu, E.I., Wabatsoma, V., Ogbaini-Emovon, E., Nwadike, V.U. & Ojide, C.K. (2015). Age and sex prevalence of infectious dermatoses among primary school children in a rural South-Eastern Nigerian community. *Pan African Medical Journal*, 20, 182.
15. Oninla, O.A., Oninla, S.O., Onayemi, O. & Olasode, O.A. (2016). Pattern of paediatric dermatoses at dermatology clinics in Ile-Ife and Ilesha, Nigeria. *Paediatrics and International Child Health*, 36(2), 106–112.
16. Hogewoning, A., Amoah, A., Bavinck, J.N.B., Boakye, D., Yazdanbakhsh, M., Adegnika, A., De Smedt, S., Fonteyne, Y., Willemze, R. & Lavrijsen, A. (2013). Skin diseases among schoolchildren in Ghana, Gabon, and Rwanda. *International Journal of Dermatology*, 52(5), 589–600.
17. Olsen, J.R., Gallacher, J., Piguet, V. & Francis, N.A. (2014). Epidemiology of molluscum contagiosum in children: a systematic review. *Family Practice*, 31(2), 130–136.
18. Altraide, D.D. & Alex-Hart, B.A. (2020). Prevalence and pattern of skin diseases among school age children at the University of Port Harcourt Teaching Hospital, Nigeria: a hospital based study. *Asian Journal of Research in Infectious Diseases*, 3(4), 29–36.
19. Alex-Hart, B.A. & Altraide, D.D. (2020). Prevalence of skin diseases among primary school children in three semi-urban communities in Rivers State, Nigeria: a community based study. *Asian Journal of Medicine and Health*, 18(2), 58–65.
20. Otiike-Odibi, B. & Azubogu, U.S. (2021). Infectious skin disorders encountered in children attending the dermatology clinic in a tertiary care hospital in Southern Nigeria. *Asian Journal of Research in Dermatological Science*, 4(1), 43–48.
21. Coulibaly, O., L'Ollivier, C., Piarroux, R. & Ranque, S. (2018). Epidemiology of human dermatophytoses in Africa. *Medical Mycology*, 56(2), 145–161.
22. Bagayoko, C.O., Coulibaly, O., Traoré, A.K. (2016). Dermatophytosis among schoolchildren in three eco-climatic zones of Mali. *PLoS Neglected Tropical Diseases*, 10(4), e0004675.

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