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**Original Research Article**

# Epidemiology of skin diseases among children attending the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State: a retrospective observational study

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## ABSTRACT

**Background:** Numerous studies have examined skin disease trends in Nigeria, revealing a shift towards increased allergic dermatoses. This research assessed the patient landscape at a clinic and satellite site in Obukpa, Nigeria.
**Methods:** A retrospective study of patients seen in the skin clinic of the university of Nigeria teaching hospital (UNTH), Ituku Ozalla, and the rural outpost in Obukpa between November 2009 and 2018 was carried out. A total of 1851 patients' data were analyzed. Diagnosis was based on clinical findings.
**Results:** There were more females (n=1007 [54.4%]) than males (n=844 [45.6%]). Most of the patients were of school age (6-12 years), and the most typical skin disease category was infectious disorders (32.5%), another categories/miscellaneous group (27.7%). Nearly all patients that presented to the rural outpost in Obukpa resided in the surrounding area of Nsukka (93.4%).
**Conclusions:** Comparing the study findings with an earlier one from the same center, there is no change in pattern, with infectious disorders being the most common skin disease category. However, these are largely preventable and emphasize the need for public enlightenment campaigns and policies to discourage the over-the-counter purchase of prescription-strength corticosteroid creams and antibiotics by parents and caregivers, a prevalent practice before seeking medical attention for their children. In addition, there is an urgent need to strengthen dermatologic training in primary health care settings, especially among pediatricians in Nigeria, to improve access to care.

**Keywords:** Pediatric dermatology, Infectious skin, Diseases, Fungal infections, Dermatitis/eczema

## INTRODUCTION

Skin diseases occur worldwide and constitute a significant health problem affecting a large segment of the population. Though a worldwide occurrence, the incidence of dermatologic problems differs between developed and developing countries. These patterns may be influenced by climate, socioeconomic status, genetic composition, education, personal hygiene, the patient's desire to seek treatment, and accessible medical care. Dermatologic problems account for 7-15% of visits to family practitioners in developed countries. In contrast, these diseases are prevalent in primary care settings in tropical regions and are among the most frequently encountered.[1,2] Despite the common skin diseases observed in many developing countries, they are often not considered areas of priority in health systems planning, even when specific skin manifestations precede serious skin diseases. This is due, in part, to the low mortality associated with skin diseases, as well as

insufficient knowledge and lack of recognition of the impact of skin diseases in the public health realm of developing countries.[3,4] The latter can only be accomplished by assessing the impact of skin diseases and their manifestation on the population.

Nigeria is a developing tropical country located on the western coast of Sub-Saharan Africa. With an estimated 190 million inhabitants and about 100 specialist dermatologists servicing the most populous country in Africa, the ratio of dermatologists to patients is 1:1,190,000.[4] Studies about dermatologic skin findings within the pediatric population remain scarce.

Since dermatology is still in its formative years in Nigeria, studies are needed to ascertain the dermatologic needs of the populace, especially in children.[4] In Nigeria, skin diseases in children and adults are treated by specialty dermatologists since pediatric dermatology is an evolving subspecialty. Moreover, it has been recognized that the approach to skin disease diagnosis in children requires a different methodology considering the differences in clinical presentation, treatment, and prognosis.[2]

Studies conducted among children and adolescents have shown that infectious disorders are the primary reason for visits to primary care facilities in developing countries. In Sub-Saharan Africa, skin diseases account for 6% to 24% of general pediatric consultations, with infectious diseases being the most frequently diagnosed conditions in this population.[2] Additionally, community studies have reported dermatophytosis as the highest skin burden amongst school children in urban and rural settings in contrast to atopic dermatitis observed in hospital-based settings. [3]

### *Objectives*

This study aimed at determining the epidemiology of skin diseases among children in the Southeast zone of Nigeria and assess the differences in skin diseases amongst children presenting at a general urban center and rural outpost with pediatric care clinics. With mobilization, we also aim to ascertain if certain dermatoses aggregate in a specific geographic location. Finally, it is hoped that this research contributes to the wealth of knowledge of skin diseases in Nigeria.

## METHODS

The UNTH in Enugu. UNTH is a tertiary hospital serving Enugu and surrounding southeastern states, including Benue, Port Harcourt, and Kogi. It is a retrospective observational study of patients between ages 1 to 17 who received care for dermatologic diseases at the children outpatient (CHOP) department, Skin clinic of UNTH Ituku-Ozalla, and UNTH health outpost at Obukpa Nsukka, all in Enugu state. On average, patients presenting for the first time with self-referrals, referrals from other departments or private institutions within the teaching hospital, or referrals from private clinics of the surrounding area are seen at the dermatology clinic. Skin diseases will be compared to results obtained from a previous study for the same area, considering patients seen at the outpost and the varying degree of development and economic status over the past few years. The study period is from 2009 to 2018. Data extracted from the medical records include age, sex, diagnosis, the outcome of the consultation, state of origin, and residential address. ICD-10 was used for skin disease classification.

Descriptive statistics for age (mean and standard deviation), gender and diseases (count and percentage) were reported for rural and urban clinics. A two-sample t test was performed to compare the age, and a Chi-squared test was performed to compare gender between two locations. All analyses are performed using R 4.3.2.

## RESULTS

In total, 1851 patients were studied, of which 1,685 presented to the tertiary skin clinic (urban) and 166 presented to the rural outpost; 1007 were female (54.4%) and 844 were male (45.6%). There was a significant difference in the gender distribution for the rural versus urban clinic; more male patients presented to the rural clinic (54.8%) and more female patients to the urban clinic (55.3%). Patients were grouped into toddler of ages 1-2 years, preschool of ages 3-5 years, school age of ages 6-12, and adolescents of ages 13-17 years.

The mean age of patients that presented to the rural clinic (Mean=4.11, SD=3.96) was significantly younger compared to the mean age of patients that presented to the urban clinic (Mean=9.31, SD=5.13). The five most frequently diagnosed skin disease categories for the rural and urban clinics were infectious disorders (n=678 [34.3%]), other categories/miscellaneous group (n=528 [26.7%]), dermatitis/eczema (n=460 [23.3%]), hair and nail disorders (n=128 [6.5%]), and papulosquamous disorders (n=104 [5.3%]). Of the 678 (34.3%) participants diagnosed with an infectious disorder, 296 (15%) patients had fungal infections thus making it the most common skin disease in this population followed by parasitic infections (n=163 [8.2%]). Skin diseases with nonspecific dermatologic diagnoses accounted for the other categories/ miscellaneous group (n=528 [26.7%]). The least common skin disease categories were nevi/developmental disorders (n=34 [1.7%]), keratinizing disorders (n=20 [1.0%]), granulomatous disorders (n=17 [0.9%]), connective tissue disorders (n=5 [0.3%]), and bullous disorders (n=3 [0.2%]).

Table 1 depicts the demographic characteristics of study participants. Table 2 shows the disease categories between the two locations. Supplementary information on the skin disease distributions between the two locations can be found in Appendix A.

***Skin clinic***

A total of 1,685 patients presented to CHOP (urban tertiary skin clinic) during the study period. Patients of school age (age 6-12 years) accounted for the majority of the study population (n=662) followed by adolescents (age 13 to 17 years) (n=611). Data collection regarding the place of residence is incomplete for this group and will be discussed in the discussion section. The five most common skin disease categories in this group were infectious disorders (n=571 [31.5%]), other categories/miscellaneous group (n=501 [27.7%]), dermatitis/eczema (n=434 [24.0%]), hair and nail disorders (n=122 [6.7%]), and papulosquamous disorders (n=104 [5.7%]).

Patients in the adolescents age group (n=212 [34.7%]) consisted of many infectious disorder cases, followed by school age (n=204 [30.8%]) and toddlers (n=65 [29.1%]). Fungal infections (n=272 [15.0%]) followed by parasitic infections (n=158 [8.7%]) were the most common infectious disorders observed in patients that presented to the tertiary clinic (Table 2). Scabies was the most commonly diagnosed parasitic infection (n=141 [7.8%]) (Table 3), especially in the Adolescent group (n=78 [12.8%]). Inflammatory eczematous skin disease was the most common skin disease diagnosis under dermatitis/eczema with a cumulative prevalence of 19.4% (n=352) (Appendix A), in which most patients were of preschool age (n=106 [33.8%]). Pityriasis rosea was the most common papulosquamous disorder diagnosed in patients that presented to the tertiary clinic (n=52 [2.9%]) while vitiligo was the most common disorder of pigmentation observed in this group (n=70 [3.9%]).

Table 3 shows the most common skin diseases in the rural and urban clinics while Tables 4-7 summarize the disease categories for 2 locations by age stratifications: Toddler of age 1-2 years, preschool of age 3-5 years, school age of 6-12 years, and adolescents of age 13-17 years.

***Obukpa***

A total of 166 patients presented to the rural outpost clinic. Compared to urban clinic, carbuncle (n=28 [16.9%]), fungal infection (n=24 [14.5%]), miscellaneous (n=24 [14.5%]), inflammatory eczematous skin disease (n=17 [10.2%]), and furunculosis (n=16 [9.6%]) were 5 most diagnosed skin disease categories of patients between ages of 1-17 years of age that presented to rural clinic. Toddlers accounted for most of patient population (n=90) vs adolescent group (n=6). Most patients resided in surrounding area of Nsukka (93.4%) (Table 8).

For infectious disorders, infections of bacterial origin were the most common in the rural clinic for toddlers (n=31 [34.4%]) and school age (n=14 [37.8%]) while fungal were the most common for preschool (n=10 [30.3%]) and adolescents (n=2 [33.3%]). Hair and nail disorders had higher prevalence for adolescents' group (n=1 [16.7%]) compared to other age groups.

Of the inflammatory eczematous disorders, dermatitis/ eczema was highest in the preschool group (n=11 [33.3%]).

**Table 1: Age and gender for rural and urban clinics.**

| Variables | Rural, (n=166) | Urban, (n=1685) | Overall, (n=1851) | P value |
|---|---|---|---|---|
| **Age (in years) mean (SD)** | 4.11 (3.96) | 9.31 (5.13) | 8.84 (5.25) | <0.0001[1] |
| **Gender** | | | | |
| Female | 75 (45.2%) | 932 (55.3%) | 1007 (54.4%) | 0.0156[2] |
| Male | 91 (54.8%) | 753 (44.7%) | 844 (45.6%) | |

*[1]p value from two-sample t test; [2]p value from Chi-squared test.

**Table 2: Disease categories for rural and urban clinics.**

| Disease categories | Rural, (n=166) | Urban, (n=1811) | Overall, (n=1977) |
|---|---|---|---|
| **Bullous disorders** | 0 (0) | 3 (0.2) | 3 (0.2) |
| **Connective tissue disorders** | 0 (0) | 5 (0.3) | 5 (0.3) |
| **Dermatitis/eczema** | 26 (15.7) | 434 (24.0) | 460 (23.3) |
| **Granulomatous disorders** | 0 (0) | 17 (0.9) | 17 (0.9) |
| **Hair and nail disorders** | 6 (3.6) | 122 (6.7) | 128 (6.5) |
| **Infectious disorders** | 107 (64.5) | 571 (31.5) | 678 (34.3) |
| **Bacterial** | 51 (30.7) | 43 (2.4) | 94 (4.8) |
| **Fungal** | 24 (14.5) | 272 (15.0) | 296 (15.0) |
| **Parasitic** | 5 (3.0) | 158 (8.7) | 163 (8.2) |
| **Viral** | 27 (16.3) | 98 (5.4) | 125 (6.3) |
| **Keratinizing disorders** | 0 (0) | 20 (1.1) | 20 (1.0) |
| **Nevi/developmental disorders** | 0 (0) | 34 (1.9) | 34 (1.7) |
| **Other categories/miscellaneous group** | 27 (16.3) | 501 (27.7) | 528 (26.7) |
| **Papulosquamous disorders** | 0 (0) | 104 (5.7) | 104 (5.3) |

**Table 3: The most common diseases in rural and urban.**

| Top disease in rural clinic | N (%) | Top disease in urban clinic | N (%) |
|---|---|---|---|
| Carbuncle | 28 (16.9) | Inflammatory eczematous skin disease | 343 (18.9) |
| Fungal infection | 24 (14.5) | Fungal infection | 259 (14.3) |
| Miscellaneous | 24 (14.5) | Urticaria | 243 (13.4) |
| Inflammatory eczematous skin disease | 17 (10.2) | Scabies | 141 (7.8) |
| Furunculosis | 16 (9.6) | Vitiligo | 70 (3.9) |
| Varicella zoster | 15 (9.0) | Miscellaneous | 59 (3.3) |
| Measles | 12 (7.2) | Verruca vulgaris | 54 (3.0) |
| | | Acne | 53 (2.9) |
| | | Pityriasis rosea | 52 (2.9%) |

**Table 4: Toddler (age 1-2 years) disease categories for rural and urban clinics.**

| Disease categories | Rural, (n=90) (%) | Urban, (n=223) (%) | Overall, (n=313) (%) |
|---|---|---|---|
| **Bullous disorders** | 0 (0) | 1 (0.4) | 1 (0.3) |
| **Dermatitis/eczema** | 9 (10) | 62 (27.8) | 71 (22.7) |
| **Granulomatous disorders** | 0 (0) | 4 (1.8) | 4 (1.3) |
| **Hair and nail disorders** | 5 (5.6) | 11 (4.9) | 16 (5.1) |
| **Infectious disorders** | 52 (57.8) | 65 (29.1) | 117 (37.4) |
| **Bacterial** | 31 (34.4) | 4 (1.8) | 35 (11.2) |
| **Fungal** | 7 (7.8) | 39 (17.5) | 46 (14.7) |
| **Parasitic** | 2 (2.2) | 12 (5.4) | 14 (4.5) |
| **Viral** | 12 (13.3) | 10 (4.5) | 22 (7.0) |
| **Keratinizing disorders** | 0 (0) | 1 (0.4) | 1 (0.3) |
| **Nevi/developmental disorders** | 0 (0) | 7 (3.1) | 7 (2.2) |
| **Other categories/miscellaneous group** | 24 (26.7) | 67 (30) | 91 (29.1) |
| **Papulosquamous disorders** | 0 (0) | 5 (2.2) | 5 (1.6) |

**Table 5: Preschool (age 3-5 years) disease categories for rural and urban clinics.**

| Disease categories | Rural, (n=33) (%) | Urban, (n=314) (%) | Overall, (n=347) (%) |
|---|---|---|---|
| **Dermatitis/eczema** | 11 (33.3) | 106 (33.8) | 117 (33.7) |
| **Granulomatous disorders** | 0 (0) | 3 (1.0) | 3 (0.9) |
| **Hair and nail disorders** | 0 (0) | 10 (3.2) | 10 (2.9) |
| **Infectious disorders** | 20 (60.6) | 90 (28.7) | 110 (31.7) |
| **Bacterial** | 5 (15.2) | 10 (3.2) | 15 (4.3) |
| **Fungal** | 10 (30.3) | 53 (16.9) | 63 (18.2) |
| **Parasitic** | 1 (3.0) | 6 (1.9) | 7 (2.0) |
| **Viral** | 4 (12.1) | 21 (6.7) | 25 (7.2) |
| **Keratinizing disorders** | 0 (0) | 5 (1.6) | 5 (1.4) |
| **Nevi/developmental disorders** | 0 (0) | 7 (2.2) | 7 (2.0) |
| **Other categories/miscellaneous group** | 2 (6.1) | 78 (24.8) | 80 (23.1) |
| **Papulosquamous disorders** | 0 (0) | 15 (4.8) | 15 (4.3) |

**Table 6: School age (age 6-12) disease categories for rural and urban clinics.**

| Disease categories | Rural, (n=37) (%) | Urban, (n=662) (%) | Overall, (n=699) (%) |
|---|---|---|---|
| **Bullous disorders** | 0 (0) | 1 (0.2) | 1 (0.1) |
| **Connective tissue disorders** | 0 (0) | 2 (0.3) | 2 (0.3) |
| **Dermatitis/eczema** | 5 (13.5) | 156 (23.6) | 161 (23.0) |
| **Granulomatous disorders** | 0 (0) | 7 (1.1) | 7 (1.0) |
| **Hair and nail disorders** | 0 (0) | 23 (3.5) | 23 (3.3) |
| **Infectious disorders** | 31 (83.8) | 204 (30.8) | 235 (33.6) |
| **Bacterial** | 14 (37.8) | 14 (2.1) | 28 (4.0) |
| **Fungal** | 5 (13.5) | 93 (14.0) | 98 (14.0) |
| **Parasitic** | 1 (2.7) | 62 (9.4) | 63 (9.0) |

Continued.

| Disease categories | Rural, (n=37) (%) | Urban, (n=662) (%) | Overall, (n=699) (%) |
|---|---|---|---|
| **Viral** | 11 (29.7) | 35 (5.3) | 46 (6.6) |
| **Keratinizing disorders** | 0 (0) | 9 (1.4) | 9 (1.3) |
| **Nevi/developmental disorders** | 0 (0) | 10 (1.5) | 10 (1.4) |
| **Other categories/miscellaneous group** | 1 (2.7) | 205 (31.0) | 206 (29.5) |
| **Papulosquamous disorders** | 0 (0) | 45 (6.8) | 45 (6.4) |

**Table 7: Adolescents (age 13-17 years) disease categories for rural and urban clinics.**

| Disease categories | Rural, (n=6) (%) | Urban, (n=611) (%) | Overall (n=617) (%) |
|---|---|---|---|
| **Bullous disorders** | 0 (0) | 1 (0.2) | 1 (0.2) |
| **Connective tissue disorders** | 0 (0) | 3 (0.5) | 3 (0.5) |
| **Dermatitis/eczema** | 1 (16.7) | 109 (17.8) | 110 (17.8) |
| **Granulomatous disorders** | 0 (0) | 3 (0.5) | 3 (0.5) |
| **Hair and nail disorders** | 1 (16.7) | 78 (12.8) | 79 (12.8) |
| **Infectious disorders** | 4 (66.7) | 212 (34.7) | 216 (35.0) |
| **Bacterial** | 1 (16.7) | 15 (2.5) | 16 (2.6) |
| **Fungal** | 2 (33.3) | 87 (14.2) | 89 (14.4) |
| **Parasitic** | 1 (16.7) | 78 (12.8) | 79 (12.8) |
| **Viral** | 0 (0) | 32 (5.2) | 32 (5.2) |
| **Keratinizing disorders** | 0 (0) | 5 (0.8) | 5 (0.8) |
| **Nevi/developmental disorders** | 0 (0) | 10 (1.6) | 10 (1.6) |
| **Other categories/miscellaneous group** | 0 (0) | 151 (24.7) | 151 (24.5) |
| **Papulosquamous disorders** | 0 (0) | 39 (6.4) | 39 (6.3) |

**Table 8: Pediatric patients place of residence in rural clinic.**

| Variable | Nsukka | Igbo-eze | Ekete | Unknown | Overall |
|---|---|---|---|---|---|
| **Prevalence** | 155 (93.4%) | 9 (5.4%) | 1 (0.6%) | 1 (0.6%) | 166 (4.3%) |

## DISCUSSION

Various factors, including socioeconomic and ecological factors, are used to determine the pattern of skin diseases. This study revealed that most patients seen at the general dermatology clinic and rural outpost were of school age (n=699), followed by adolescents (n=617). The study population groups displayed various skin disorders that were consistent with the results of previous surveys conducted on outpatient clinics in Nigeria.[1,5-10] Overall, the most frequently observed skin conditions in descending order were infectious disorders, dermatitis/ eczema, hair and nail disorders, and papulosquamous disorders. This is concordant with previous community and hospital-based studies in Nigeria including Onyekonwu et al in Ituku-Ozalla, Enugu State, and Amoran et al Sagamu Kano, Nigeria.[1,3,7,9-11] This contrasts with developed countries, including the United States, which reported higher rates of inflammatory dermatoses, specifically atopic dermatitis.[11] Infections/infestations were the most observed group of skin disorders observed in Toddlers, followed by Adolescents. Infections/infestation prevalence is not implausible given the abuse of antibiotics and other topical steroids containing anti-infective and super potent steroids, as frequently occurs in Nigeria, where drug recruitment remains unregulated.[5] Thus, such practices may suppress skin immunity and the resurgence of infectious skin diseases. In addition, poor personal hygiene, low socioeconomic status, humidity and poor sanitation are known contributors of skin infections amongst children and adolescents in Nigeria.[1,8]

Infections of fungal origin remained the most common for the urban clinic in all age groups and was the commonest in the rural outpost in Obukpa for preschool and adolescents. This is not surprising as Nigeria is a tropical country with high humidity in which fungal organisms flourish.[2] Additionally, inadequate personal hygiene and sanitation create conducive conditions for fungal skin infections to thrive.[1,2] To prevent the infection from spreading, it is crucial to enhance health education and promote good personal hygiene and sanitation practices, especially among caregivers of young children. This is particularly important as the infection is known to spread rapidly in schools during outbreaks.[2] However, it is essential to note that although fungal infections were the most observed infection/infestation overall, bacterial infections topped the list in the rural clinic for toddler and school age.

Parasitic skin infections were the second most common cause of infections, which reflects a similar trend reported by Onayemi et al in north-western Nigeria but contrasts the study in Lagos, Nigeria, where viral skin infections accounted for the second most prevalent skin infection.[2,7] Scabies was low in frequency (1.6%) in the

study conducted by Onayemi et al but accounted for 8.2% of parasitic skin infections observed in this study.

Under inflammatory eczematous dermatoses, dermatitis/eczema was the second most frequently encountered category (18.9%). This is similar to observations by Onyekonwu and Onayemi et al.[1,7] Worldwide, atopic dermatitis (AD) significantly contributes to the overall burden of skin-related diseases. Although the incidence of atopic dermatitis is decreasing in developed countries, it is increasing in developing countries, including Africa, as evidenced by a prevalence rate of 2.6% reported in 1989.[1,2,12] This persistent rise may be attributable to urbanization, the adoption of westernized lifestyles, lack of consistent diagnostic criteria and consistent treatment guidelines, treatment with medicinal medicines, and factors endemic to developing countries, including cost, lack of specialists, and access to care amongst a plethora of other factors.[1,12]

Most skin diseases in this study population occurred in children 6 years and above. A Nigerian study conducted by Amoran et al demonstrated a similar prevalence. It has been hypothesized that the prevalence could be attributed to this age group not seeking treatment secondary to their perception that skin diseases are insignificant cosmetic issues rather than serious health concerns.[9] It was observed that there were more females (n=1007) than males (n=844) in this study population and that females were more affected across most diseases. This may be explained by the abuse of steroid creams due to greater parental care, thus resulting in unintentional skin infections.[7]

The skin clinic and health outpost in Obukpa relies on dermatology residents for patient treatment. However, inconsistent coverage since 2015 may have impacted the breadth of pediatric dermatoses presenting to the outpost within the last three years. Additionally, due to unclear diagnosis, many unnamed conditions subsumed under the 'miscellaneous' group contribute to the underestimation of the distribution of skin diseases presenting to the rural outpost.

### *Limitations*

There are several limitations to this study. The use of paper medical records presented specific challenges. Illegible handwriting and the quality of nursing documentation presented errors in data interpretation and accuracy. In addition, the need for chart reviews by the chief medical officer in Obukpa lends to the issue of data reliability. Since medical records of dermatological patients of UNTH presenting after one year are stored in a collective space with medical records of other teaching hospital departments, accessing data within the 9-year timeline presented additional difficulties in data collection. In addition, the advent of the COVID-19 pandemic posed an unprecedented challenge, severely impacting health systems worldwide. As a result, non-COVID clinical research was suspended and, ultimately, attributed to the incomplete data retrieval regarding the place of residence from the skin clinic of UNTH Ituku-Ozalla and thus its exclusion from the study.

Factors that may contribute to determining patterns of diagnosis or different presentations of skin dermatoses were not sought in this study. Such factors include caregiver sociodemographic characteristics, which were not collected during initial and recurring visits. Since this is a retrospective study, the hygienic practices of this pediatric population were not collected at the time of the study. Lastly, certain skin diseases, mostly dermatitis, overlapped in multiple categories of the ICD-10 classification system used in this study.

## CONCLUSION

In conclusion, this study demonstrates that infections and infestations such as tinea capitis are still the most common skin infection among children attending the dermatology clinic, followed by inflammatory dermatoses, specifically atopic dermatitis, and urticaria. The findings of this study offer detailed insights that could inform future epidemiological and clinical research, as well as aid in evaluating evolving patterns in pediatric dermatological conditions in Nigeria. Increasing the training of pediatric residents and primary care physicians can enhance the effectiveness of first-line treatment, leading to more accurate diagnoses and better outcomes. Teledermatology is also pertinent to litigate the distance to receiving care. These factors are especially important considering the vast array of diseases encountered and the limited number of healthcare professionals with specialized expertise in Nigeria.

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## APPENDIX

### Table 1: Skin diseases distributions for the rural and urban clinics (Appendix A).

| Disease | Rural, (n=166) | Urban, (n=1811) | Overall, (n=1977) |
|---|---|---|---|
| **Bullous disorders** | | | |
| Bullous pemphigus | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Pemphigus foliaceus | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| **Connective tissue disorders** | | | |
| Progressive systemic sclerosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Subcutaneous lupus erythematosus | 0 (0%) | 4 (0.2%) | 4 (0.2%) |
| **Dermatitis/eczema** | | | |
| Allergic contact dermatitis | 6 (3.6%) | 0 (0%) | 6 (0.3%) |
| Atopy | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Dermatitis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Dermatitis cruris pustulosa et atrophicans | 0 (0%) | 4 (0.2%) | 4 (0.2%) |
| Discoid eczema | 0 (0%) | 3 (0.2%) | 3 (0.2%) |
| Eczema | 0 (0%) | 9 (0.5%) | 9 (0.5%) |
| Eczema herpeticum | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Exfoliative dermatitis | 0 (0%) | 3 (0.2%) | 3 (0.2%) |
| Fixed drug reaction | 3 (1.8%) | 22 (1.2%) | 25 (1.3%) |
| Inflammatory eczematous skin disease | 17 (10.2%) | 352 (19.4%) | 369 (18.7%) |
| Irritant diaper dermatitis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Lichen simplex chronicus | 0 (0%) | 11 (0.6%) | 11 (0.6%) |
| Perioral dermatitis | 0 (0%) | 4 (0.2%) | 4 (0.2%) |
| Pityriasis alba | 0 (0%) | 17 (0.9%) | 17 (0.9%) |
| Prurigo nodularis | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Seborrhoea | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Seborroeic dermatitis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| **Granulomatous disorders** | | | |
| Foreign body granuloma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Granuloma annulare | 0 (0%) | 13 (0.7%) | 13 (0.7%) |
| Pyogenic granuloma | 0 (0%) | 3 (0.2%) | 3 (0.2%) |
| **Hair and nail disorders** | | | |
| Acne | 1 (0.6%) | 53 (2.9%) | 54 (2.7%) |
| Acne keloidalis nuchae | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Acne vulgaris | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Alopecia | 0 (0%) | 8 (0.4%) | 8 (0.4%) |
| Alopecia areata | 0 (0%) | 8 (0.4%) | 8 (0.4%) |
| Alopecia areata totalis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Folliculitis | 5 (3.0%) | 12 (0.7%) | 17 (0.9%) |
| Ingrowing toenail | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Keloid | 0 (0%) | 19 (1.0%) | 19 (1.0%) |
| Keloidalis nuchae | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Miliaria rubra | 0 (0%) | 6 (0.3%) | 6 (0.3%) |
| Nail dystrophy | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Paronychia | 0 (0%) | 6 (0.3%) | 6 (0.3%) |
| Rosacea | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Trachyonychia | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| **Infectious disorders** | | | |
| Carbuncle | 28 (16.9%) | 2 (0.1%) | 30 (1.5%) |
| Cellulitis | 5 (3.0%) | 3 (0.2%) | 8 (0.4%) |
| Cutaneous larva migrans | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Fungal infection | 24 (14.5%) | 259 (14.3%) | 283 (14.3%) |
| Furunculosis | 16 (9.6%) | 2 (0.1%) | 18 (0.9%) |
| Genital warts | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Impetigo | 2 (1.2%) | 29 (1.6%) | 31 (1.6%) |
| Inflammatory linear verruca | 0 (0%) | 1 (0.1%) | 1 (0.1%) |

Continued.

| Disease | Rural, (n=166) | Urban, (n=1811) | Overall, (n=1977) |
|---|---|---|---|
| **Infectious disorders** | | | |
| Leprosy | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Lymphatic filariasis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Measles | 12 (7.2%) | 0 (0%) | 12 (0.6%) |
| Molluscum contagiosum | 0 (0%) | 35 (1.9%) | 35 (1.8%) |
| Onchocerciasis | 0 (0%) | 11 (0.6%) | 11 (0.6%) |
| Pityriasis versicolor | 0 (0%) | 11 (0.6%) | 11 (0.6%) |
| Scabies | 5 (3.0%) | 141 (7.8%) | 146 (7.4%) |
| Shingles | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Syphilis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| T. Unguium | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Trichomycosis pubis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Varicella zoster | 15 (9.0%) | 2 (0.1%) | 17 (0.9%) |
| Verruca plana | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Verruca vulgaris | 0 (0%) | 54 (3.0%) | 54 (2.7%) |
| **Keratinizing disorders** | | | |
| Ichthyosis vulgaris | 0 (0%) | 11 (0.6%) | 2 (0.6%) |
| Keratosis pilaris | 0 (0%) | 9 (0.5%) | 9 (0.5%) |
| **Nevi/developmental disorders** | | | |
| Haemangioma | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Nevi | 0 (0%) | 29 (1.6%) | 29 (1.5%) |
| **Other categories/miscellaneous group** | | | |
| Acanthosis nigricans | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Actinic keratosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Albinism | 0 (0%) | 6 (0.3%) | 6 (0.3%) |
| Allergic conjunctivitis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Angular stomatitis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Bacillary angioma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Callus | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Cheilitis | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Chronic urticaria | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Cutaneous mastocytosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Dermatitis papulosa nigra | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Dermatofibrosarcoma protuberans | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Dermatographism | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Drug allergy | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Elephantiasis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Ephelides | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Epidermodysplasia verruciformis | 0 (0%) | 22 (1.2%) | 22 (1.1%) |
| Erythema | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Erythema multiforme | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Erythematosus | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Histiocytosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Hypertrophic scar | 0 (0%) | 3 (0.2%) | 3 (0.2%) |
| Hypomelanosis | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Hypovitaminosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Kaposis sarcoma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Keratosis plantaris | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Lentigenes | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Lymphoedema | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Melanoma | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Melasma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Miscellaneous | 24 (14.5%) | 59 (3.3%) | 83 (4.2%) |
| Neurofibromatosis | 0 (0%) | 14 (0.8%) | 14 (0.7%) |
| Oculocutaneous albinism | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Palmoplantar keratoderma | 0 (0%) | 4 (0.2%) | 4 (0.2%) |
| Papular urticaria | 0 (0%) | 4 (0.2%) | 4 (0.2%) |

Continued.

| Disease | Rural, (n=166) | Urban, (n=1811) | Overall, (n=1977) |
|---|---|---|---|
| **Other categories/miscellaneous group** | | | |
| Phrynoderma | 0 (0%) | 10 (0.6%) | 10 (0.5%) |
| Piebaldism | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Post inflammatory hyperpigmentation | 0 (0%) | 10 (0.6%) | 10 (0.5%) |
| Post steroid syndrome | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Rhabdomyosarcoma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Rosai–dorfman disease | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Sebeceous adenoma | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Somatization disorder | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Syringoma | 0 (0%) | 7 (0.4%) | 7 (0.4%) |
| Thermal burn | 1 (0.6%) | 0 (0%) | 1 (0.1%) |
| Toxic epidermal necrolysis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Tuberous sclerosis | 0 (0%) | 2 (0.1%) | 2 (0.1%) |
| Urticaria | 0 (0%) | 243 (13.4%) | 243 (12.3%) |
| Varicose veins | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Vitiligo | 2 (1.2%) | 70 (3.9%) | 72 (3.6%) |
| Xerosis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| **Papulosquamous disorders** | | | |
| Gianotti-crosti syndrome | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Guttate psoriasis | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Lichen nitidus | 0 (0%) | 6 (0.3%) | 6 (0.3%) |
| Lichen planus | 0 (0%) | 17 (0.9%) | 17 (0.9%) |
| Lichen striatus | 0 (0%) | 5 (0.3%) | 5 (0.3%) |
| Pityriasis lichenoides | 0 (0%) | 1 (0.1%) | 1 (0.1%) |
| Pityriasis rosea | 0 (0%) | 52 (2.9%) | 52 (2.6%) |
| Psoriasis | 0 (0%) | 21 (1.2%) | 21 (1.1%) |