

Original article



Prevalence of Skin and Psychiatric Disorders among People Living with HIV in Kaduna: A Cross-Sectional Study

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ABSTRACT

Background: HIV/AIDS remains a major public health challenge in Nigeria. Dermatologic and psychiatric manifestations are common but often under-recognized complications in people living with HIV (PLWH). This study aimed to assess the prevalence and types of skin and psychiatric disorders in HIV-infected individuals and evaluate their relationship with viral load and antiretroviral therapy (ART).

Methods: A cross-sectional study was conducted at two HIV treatment centers in Kaduna State: Barau Dikko Teaching Hospital and 461 Nigerian Air Force Hospital. HIV-positive patients with skin disorders and documented viral load results were recruited through convenience sampling. Dermatological diagnoses were made by a consultant dermatologist, and psychological assessments were conducted using the GHQ-12 screening tool. Statistical analysis included Chi-square testing to determine associations between variables.

Results: Of the 270 patients enrolled, 139 (51.5%) had skin disorders. Papulosquamous disorders were the most frequent (13.3%), followed by pigmentary disorders (7.8%), eczematous dermatitis (6.7%), and fungal infections (5.2%). A significant association was found between skin disorders and viral load suppression ($p = 0.008$), with unsuppressed viral load more common in patients with dermatologic conditions. ART regimen also showed significant association ($p = 0.038$). Analysis of the GHQ scores showed that 12% of all the participants have a high GHQ score, suggestive of a psychological disorder. The corresponding percentage for patients with skin disorders is 15% compared to those without skin disorders, 9.16%.

Conclusion: Skin disorders are prevalent among HIV patients in Kaduna and are associated with viral suppression and ART regimen. Given their psychosocial and clinical implications, routine dermatologic and mental health screening should be integrated into HIV care to improve patient outcomes.

Keywords: HIV, skin disorders, psychiatric comorbidity, ART, viral load, Nigeria

Introduction

HIV/AIDS remains a significant public health concern in Nigeria, with an estimated national prevalence of 1.4% and over 1.8 million people living with HIV (PLWH).¹ Despite advancements in antiretroviral therapy (ART) and policy-level efforts, dermatological and psychological complications continue to affect the quality of life and clinical outcomes in PLWH.

Cutaneous manifestations are among the earliest and most visible signs of HIV infection.² Nearly all patients develop skin or mucosal disorders at some stage, which may be disease-related, ART- induced, or reflective of immune reconstitution inflammatory syndrome (IRIS).³ Common skin conditions in HIV include pruritic papular eruption (PPE), seborrheic dermatitis, Kaposi sarcoma, herpes simplex, molluscum contagiosum, and various fungal and bacterial infections.^{2,4} These disorders can be disfiguring, recurrent, and stigmatizing.

In Nigeria, the prevalence of skin disorders among HIV patients varies by region, from 27% in Ilorin⁵ to 83% among children in Lagos⁶. However, few studies have explored the psychological burden of these conditions. Mental health challenges such as depression and anxiety are common in HIV-infected populations, often exacerbated by stigma and visible symptoms.⁷ Studies show that major depression is twice as prevalent in HIV-infected individuals as in HIV-negative ones.⁸ In Kaduna, a prior study reported that 87.2% of patients with HIV-related skin conditions had concurrent psychiatric disorders.³⁴

Materials and Methods

Study sites

It will be conducted at Barau Dikko Teaching Hospital (BDTH) and 461 Nigerian Air Force Hospital (461 NAFH). Both hospitals are situated within Kaduna metropolis and provide care and treatment for patients with HIV infection. The Barau Dikko Teaching Hospital is a 300 bedded tertiary health care facility located in Kaduna North Local Government Area, while 461 Nigerian Air Force hospital is a secondary health care facility located in Igabi local government area of Kaduna state. BDTH caters for 4695 HIV patients, while 461 NAFH caters for 987 HIV patients as at 26th September 2022.

Study population

All HIV patients accessing care at the two facilities formed the study frame.

Sampling technique

Convenient sampling method was used to choose participants for the study.

Inclusion criteria

HIV patients with skin disorders and a current viral load result.

Exclusion criteria

Non-HIV patients, newly diagnosed patients without a viral load result. Patients with a history of established psychiatric illness.

Consent

All patients attending the HIV clinic were briefed about the study, only those that gave consent and satisfy the inclusion criteria were enrolled into the study.

Ethical consideration

Ethical approval was obtained from the health research and ethics committees of BDTH. Permission to collect data from the hospitals was sought from the management of both hospitals.

Study design and procedure

The study was cross sectional. HIV patients with and without skin disorders were enrolled into the study after consenting. A questionnaire was used for data collection. A consultant dermatologist examined the participants to determine the diagnosis of the skin disorder while GHQ 12 questionnaire was used for psychological assessment. Trained interviewers were used for those who cannot read and write. Patients were assessed as they attend the regular follow up visits.

Sample size

Sample size for the study was calculated using the formula below¹⁰

$$N = z^2 pq / d^2$$

N = the desired sample when the population is greater than 10,000.

Z = the desired normal deviate, usually set at 1.96, which corresponds to the 95% confidence level.

P = the prevalence rate of psychiatric disorders among HIV patients in a previous study²⁶

$Q = 1 - P$.

D = degree of accuracy desired, usually set at 0.05. Therefore, the minimal sample size required will be:

$$N = (1.96)^2 \times 0.22 \times 1-0.22$$

$$0.052$$

$$= 3.84 \times 0.22 \times 0.78$$

$$0.0025$$

$$= 263.58 \approx 264$$

Sample size calculation for population < 10,000:

$n_{nf} = 1 + n/N$ n_{nf} = the desired sample size when the population is less than 10,000. n = calculated sample size, which is 263.58.

N = the estimated population size of the HIV clinic.

$$N_{f} = 264$$

$$1 + 264/4695$$

$$= 264$$

$$0.0562$$

$$= 249.95 \approx 250$$

Therefore, the minimum sample size required was 250 participants.

Results

Participant Characteristics

A total of 270 HIV-positive individuals were enrolled in this study. The mean age of the participants was 45.3 years (SD ± 12.5), reflecting a middle-aged cohort typically seen in long-term ART programs. The age distribution further suggested a predominance of adults in the economically active phase of life, with implications for social responsibility and quality of life. The majority of respondents were female (71.9%, $n = 194$) as shown in

Table 1, aligning with national epidemiological patterns that show higher HIV prevalence and clinic attendance among women in Nigeria. Additionally, most participants were married (67.4%), while the remainder were single (14.1%), divorced (9.6%), or widowed (8.9%).

In terms of virological status, 94.8% ($n = 256$) of participants had suppressed viral loads (<1,000 copies/mL), indicative of a generally successful ART response across the cohort. However, 5.2% ($n = 14$) had unsuppressed viral loads, suggesting either recent infection, suboptimal adherence, drug resistance, or regimen failure. Skin disorders were reported in 51.5% ($n = 139$) of the participants, indicating that dermatological issues remain a significant concern in the ongoing management of HIV, even in virologically suppressed populations.

Prevalence and Patterns of Skin Disorders

Among those with skin disorders ($n = 139$), the most frequently encountered category was papulosquamous disorders, comprising 13.3% of the total cohort. These were primarily represented by pruritic papular eruptions (PPE), a hallmark dermatologic finding in immunocompromised individuals. Following closely were pigmentary disorders (7.8%), including generalized hyperpigmentation and vitiligo, which may reflect either post-inflammatory changes or adverse reactions to ART.

Eczematous dermatitis accounted for 6.7%, with xerosis and seborrheic dermatitis being the dominant subtypes. Fungal infections such as tinea corporis, tinea cruris, and pityriasis versicolor made up 5.2%, consistent with the immunosuppressed status of many PLWH. Less commonly reported conditions included bacterial infections (3.7%), viral skin infections (3.3%), and acneiform eruptions (1.5%) as shown in Table 2.

This pattern of dermatological disease is consistent with findings from other low- and middle- income countries, where infections and inflammatory conditions dominate the clinical spectrum. The variety of presentations underscores the need for sustained dermatologic surveillance as part of comprehensive HIV care.

Association with Viral Load

Statistical analysis revealed a significant association between skin disorders and viral load suppression ($\chi^2 =$

6.928, $df = 1$, $p = 0.008$). Among the 139 participants with skin conditions, 127 (91.4%) had suppressed viral loads, whereas the remaining 12 (8.6%) had unsuppressed viral loads. In contrast, among those without skin disorders, 98.5% (129/131) had suppressed viral loads, and only 1.5% (2/131) had unsuppressed viral loads.

This inverse relationship suggests that patients with poor virological control are more likely to exhibit dermatologic complications. It supports the hypothesis that certain skin conditions may act as early clinical indicators of immune compromise or virologic failure, particularly in resource-limited settings where routine viral load monitoring may be irregular.

Association with ART Regimen

A statistically significant relationship was observed between ART regimen and the presence of skin disorders ($\chi^2 = 11.777$, $df = 5$, $p = 0.038$). The vast majority of participants (94.7%, $n = 255$) were on the standard first-line regimen of Tenofovir/Lamivudine/Dolutegravir (TDF/3TC/DTG), in accordance with Nigeria's national HIV treatment guidelines. However, alternative regimens such as Abacavir/Lamivudine/Atazanavir-Ritonavir (ABC/3TC/ATVR) and Tenofovir/Lamivudine/Atazanavir-Ritonavir (TDF/3TC/ATVR) were more frequently prescribed among patients with dermatologic complications.

This finding may suggest that skin disorders could either precipitate regimen switching due to side effects or reflect pre-existing treatment failure requiring second-line therapy.

It also raises questions about the dermatologic safety profiles of different ART combinations, particularly those involving protease inhibitors, which have been implicated in cutaneous reactions in previous studies.

Psychological Distress Based on GHQ-12 Screening

The GHQ-12 tool was administered to all participants as a screening measure for psychological distress. Overall, 12% of the study population scored above the threshold suggestive of probable psychiatric morbidity. Notably, psychological distress was more prevalent among those with skin disorders (15%) compared to those without skin disorders (9.16%).

This difference, though not statistically tested here, suggests a potential association between dermatologic disease and psychological well-being in PLWH. The visibility of many skin lesions, especially those involving the face, neck, and arms can have a profound impact on self-esteem, social interactions, and internalized stigma. It may also act as a constant reminder of the underlying illness, thus reinforcing anxiety, depression, or feelings of hopelessness.

While formal psychiatric evaluation was beyond the scope of this study, the elevated GHQ scores suggest a potential burden of psychological distress in this subpopulation. Future research could build on these findings by employing structured diagnostic tools to determine the specific types of psychiatric disorders—such as major depressive disorder, generalized anxiety, adjustment disorder, or somatoform conditions—that may be prevalent among HIV-positive individuals with skin manifestations.

Variable	Frequency (%)
Age group	
18-27	20 (7.4%)
28-37	52 (19.3%)
38-47	93 (34.4%)
48-57	64 (23.7%)
Gender	
Male	76 (28.1%)
Female	194 (71.9%)
Skin Disorder	
Yes	139 (51.5%)
No	131 (48.5%)
Viral Load	
Suppressed	256 (94.8%)
Unsuppressed	14 (5.2%)

Table 1: Baseline Characteristics of Participants (N=270)

Skin Disorder Type	Frequency (%)
Papulosquamous	36 (13.3%)
Pigmentary	21 (7.8%)
Eczematous dermatitis	18 (6.7%)
Fungal infection	14 (5.2%)
Benign neoplastic	13 (4.8%)
Bacterial Infections	10 (3.7%)
Viral Infections	9 (3.3%)
Acne	4 (1.5%)
Hair disorder	3 (1.1%)
Miscellaneous	3 (1.1%)
Infestations	2 (0.7%)
Genetic Disorders	1 (0.4%)
Vascular Disorders	1 (0.4%)
Mucocutaneous Lesions	1 (0.4%)
Urticaria	1 (0.4%)
Autoimmune Disorders	1 (0.4%)
Drug reaction	1 (0.4%)

Table 2: Types of Skin Disorders Observed (N=139)

ART Regimen	Skin Disorder: Yes	Skin Disorder: No
TDF/3TC/DTG	128	127
ABC/3TC/ATVR	3	1
TDF/3TC/LPVr	1	0
TDF/3TC/ATVR	6	0
AZT/3TC/ATVR	1	0
TDF/3TC/DRV	0	3

Table 3: Skin Disorders vs. ART Regimens

DISCUSSION

This study reaffirms that skin disorders are still a common challenge among people living with HIV, despite the progress made with antiretroviral therapy (ART). The prevalence of 51.5% observed in this cohort is consistent with findings from other regions of Nigeria, including Osun and Lagos states, where similar or even higher rates have been reported. For example, previous studies recorded skin disorder rates of 53% in Osun and up to 83% among children living with HIV in Lagos 11,12. These figures highlight that dermatologic complications remain a persistent issue, even in patients with virologic suppression.

The significant association between skin conditions and unsuppressed viral load in this study adds to existing evidence that skin manifestations can serve as a clinical warning sign. Several studies have noted that when HIV is poorly controlled—either due to treatment failure or non-adherence—there tends to be a resurgence of skin-related symptoms such as pruritic papular eruptions and opportunistic infections like candidiasis and herpes simplex 11,13,14. In situations where viral load testing is limited or delayed, the presence of new or worsening skin lesions could prompt clinicians to reassess a patient's immune status or treatment adherence.

We also found that patients on second-line ART regimens, especially those involving protease inhibitors like atazanavir/ritonavir, were more likely to present with dermatological complaints. While this observation does not establish a direct cause-effect relationship, it does raise important questions about drug tolerability and potential side effects associated with long-term ART use. Prior studies have documented dermatologic adverse effects with

certain regimens, including drug-induced rashes, hypersensitivity reactions, and pigmentary changes 12,15. These findings underscore the need for routine dermatologic evaluation in HIV care, especially when initiating or modifying ART regimens.

In addition to the physical health implications, this study draws attention to the psychological dimension of living with visible skin disorders. Even though our assessment was limited to screening using the GHQ-12 questionnaire, the results revealed that psychological distress was more commonly reported among participants with skin disorders compared to those without. This finding aligns with previous research showing that HIV patients with visible lesions often experience higher rates of anxiety, depression, and social withdrawal^{16,17}.

Stigma remains at the heart of this psychological burden. In many communities, certain skin conditions are strongly associated with HIV and may unintentionally expose a person's serostatus. This can lead to discrimination in the workplace, rejection within families, or avoidance by peers, even when the individual is otherwise clinically stable. Such experiences can erode self-esteem and affect treatment adherence, creating a cycle of worsening outcomes. As such, the presence of skin disorders is not just a cosmetic or clinical issue—it has real emotional and social consequences for the patient^{18,19}.

These findings speak to the need for a more integrated approach to HIV care, one that goes beyond managing viral load and CD4 count. Routine screening for mental health, using simple and validated tools like the GHQ-12 or PHQ-9, could be incorporated into follow-up visits. Where possible, access to mental health professionals and dermatology

services should be included in HIV treatment centers. Even brief counselling sessions or peer support groups could go a long way in helping patients manage both the visible and invisible burdens of the disease.

Importantly, this study adds to the growing body of evidence suggesting that a holistic, person- centred approach is essential for HIV care in Nigeria and similar settings. By recognizing and responding to the dermatologic and psychological needs of patients, not just the virologic metrics— we can enhance treatment outcomes, reduce stigma, and improve overall quality of life.

Limitations

This study has several limitations. Its cross-sectional design precludes causal inferences between ART, viral load, and skin disorders. The single-center recruitment may limit generalizability, and the small subgroup sizes for non-DTG regimens reduce statistical power. Additionally, the absence of CD4+ cell count data restricts the ability to correlate immune status with dermatological manifestations. Prospective studies incorporating immunological markers and longitudinal follow- up are needed to validate these findings.

Conclusion

This study highlights the continuing burden of skin disorders among people living with HIV in Kaduna, even in the context of widespread ART use and high levels of viral suppression. The prevalence of dermatologic conditions over 50% in this cohort confirms that cutaneous manifestations remain a relevant and often distressing aspect of HIV, with clinical and psychosocial implications. The significant association between unsuppressed viral load and skin disorders reinforces the importance of routine skin examinations as part of HIV care, potentially serving as early indicators of treatment failure or poor adherence. Furthermore, the observed link between certain ART regimens and skin conditions calls for closer monitoring of drug tolerability, particularly with second-line therapies. Notably, psychological distress was more common among patients with skin disorders, pointing to the need for integrated mental health support. Although formal psychiatric diagnoses were beyond the scope of this study, the findings suggest that visible HIV-related conditions may contribute to stigma, low self-esteem, and poor treatment

outcomes.

In light of these findings, we recommend incorporating both dermatologic and mental health assessments into routine HIV services. Such an approach will help ensure a more holistic, person- centered model of care, one that improves not just viral suppression, but also the overall well-being and dignity of those affected by HIV.

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Authors' contributions: HS, HBY and BAY conceived the study and led the data collection. All authors contributed to the study design, data analysis, and manuscript drafting. All authors read and approved the final manuscript.

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