

OCCURRENCE OF SKIN AND PSYCHIATRIC DISORDERS AMONG PEOPLE LIVING WITH HIV IN KADUNA METROPOLIS: A CROSS-SECTIONAL STUDY

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ABSTRACT

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 assessed the occurrence and patterns of skin and psychiatric disorders among PLWH in Kaduna metropolis and examined their association with viral load suppression and antiretroviral therapy (ART). A cross-sectional study was conducted among 270 HIV-positive patients attending two HIV treatment centres in Kaduna State. Dermatologic diagnoses were made by a consultant dermatologist, while psychological distress was screened using the 12-item General Health Questionnaire (GHQ-12). Viral load and ART regimen data were extracted from clinical records. Associations were assessed using chi-square tests. Skin disorders were present in 51.5 % of participants. Papulosquamous disorders (13.3 %) were the most common. A significant association was observed between skin disorders and unsuppressed viral load ($p = 0.008$), as well as ART regimen ($p = 0.038$). Psychological distress suggestive of psychiatric morbidity was identified in 12 % of participants and was more frequent among those with skin disorders. Dermatologic manifestations remain common among PLWH in Kaduna and are significantly associated with virological control and ART regimen. Integrating dermatologic and mental health screening into routine HIV care may improve overall patient outcomes.

Keywords: HIV, skin disorders, psychiatric morbidity, viral load, antiretroviral therapy, Nigeria

INTRODUCTION

HIV/AIDS remains a major public health challenge in Nigeria, with over 1.8 million people living with the infection (NACA, 2023). Despite expanded access to antiretroviral therapy (ART), HIV-associated comorbidities, particularly dermatologic and psychiatric conditions, continue to affect quality of life adversely. Cutaneous manifestations are often among the earliest clinical indicators of immune compromise and may reflect disease progression, treatment failure, or adverse drug reactions (Cedeno-Laurent et al., 2011; Bouscarat and Chosidow, 2015).

Nearly all individuals with HIV develop at least one skin or mucosal disorder during the course of illness, ranging from inflammatory and infectious dermatoses to neoplastic and drug-related reactions (Goldstein and Berman, 1997; Cedeno-Laurent et al., 2011; Levy and Jacobson, 2012; Sendrasoa et al., 2023). Kaposi sarcoma, herpes simplex, molluscum contagiosum, and various fungal and bacterial infections (Resneck et al., 2004; Cedeno-Laurent et al.,

2011 and Sendrasoa et al., 2023). These disorders can be disfiguring, recurrent, and stigmatizing. In parallel, psychiatric disorders, particularly depression and anxiety, are more prevalent among people living with HIV than in the general population, often compounded by stigma, chronic disease burden, and visible skin lesions (Ciesla and Roberts, 2001; Adewuyi and Afolabi, 2008). In Nigeria, a growing body of empirical evidence has consistently demonstrated a high burden of HIV-related skin disorders (Shittu et al., 2016; Altraide, Amaewhule, and Otike-Odibi, 2021; Akinkugbe, Balogun, and Ayanlowo, 2022; Yahya, 2022; Yahya, 2023; Ewurum et al., 2025). However, the reported prevalence varies considerably across geographic locations and study populations. Among adults living with HIV, prevalence rates of cutaneous disorders have been reported as 34.6 % in Port Harcourt (Altraide, Amaewhule, and Otike-Odibi, 2021), 33.9 % in Ilorin (Shittu et al., 2016), 33 % in Kaduna (Yahya, 2023), and 27.9 % in Lagos (Akinkugbe, Balogun, and Ayanlowo, 2022). Notably, studies indicate a substantially higher burden of skin disorders among HIV-infected children compared with adults. Yahya (2022) documented a prevalence of 78 % among children in Kano, while Ewurum et al. (2025) reported a prevalence of 55.8 % among pediatric patients in Umuahia, southeastern Nigeria. Collectively, these findings underscore both the widespread nature of HIV-associated skin disorders in Nigeria

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 (Ahmed et al., 2022). Studies show that major depression is twice as prevalent in HIV-infected individuals as in HIV-negative ones (Bernard, Dabis and de Rekeneire, 2017). In Kaduna, a prior study reported that 87.2 % of patients with skin conditions had concurrent psychiatric disorders (Yakasai et al., 2020).

However, limited research has simultaneously examined dermatologic manifestations, psychological distress, and virological control in the era of dolutegravir-based ART. This study, therefore, determined the occurrence and pattern of skin and psychiatric disorders among people living with HIV in Kaduna metropolis and the association with viral load status and ART regimen

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study was conducted at Barau Dikko Teaching Hospital and 461 Nigerian Air Force Hospital, both located within the Kaduna metropolis, from April 2023 to September 2024. Barau

Dikko Teaching Hospital is a 300-bed tertiary health care facility located in Kaduna North local government area (LGA), while 461 Nigerian Air Force hospital is a 200-bed secondary health care facility located in Igabi LGA of Kaduna state. These facilities provide comprehensive HIV care services and collectively manage over 5,600 PLWH as of 26th September 2024

Study Population

The study population comprised HIV-positive adults receiving care at the two facilities. Eligible participants were HIV-positive patients with current viral load results, with or without skin disorders. Non-HIV patients, newly diagnosed patients without a viral load result, patients with established psychiatric illness, or those on antipsychotic medications were excluded.

Sample Size Determination

The sample size for the study was calculated using the formula below (Araoye, 2004)

$$N = \frac{(z^2pq)}{d^2}$$

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 study (Kelly et al., 1998)

Q = 1 – P.

D = degree of accuracy desired, usually set at 0.05.

Therefore, the minimal sample size required will be:

$$N = \frac{(1.96)^2 \times 0.22 \times 1-0.22}{0.05^2}$$

$$= 263.58 \Rightarrow 264$$

Sample size calculation for population < 10,000:

$$nf = \frac{n}{1+n/N}$$

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.

$$Nf = \frac{264}{1+264/4695}$$

$$= 249.95 \Rightarrow 250$$

Therefore, the minimum sample size required is 250 participants. The minimum sample size was calculated using standard epidemiological formulae based on a prior prevalence of psychiatric morbidity among HIV patients, adjusted for finite population and attrition, yielding a minimum sample size of 250 participants as shown above. A total of 270 patients were included in the study. Convenient sampling method was used to choose participants for the study.

Data Collection.

Data collection was carried out using a structured, self-administered questionnaire to obtain relevant sociodemographic and clinical information. Participants with skin disorders underwent a comprehensive dermatological examination conducted by a consultant dermatologist. Psychological distress was evaluated using the 12-item General Health Questionnaire (GHQ-12). The GHQ-12 was scored in accordance with standard guidelines, and respondents with scores greater than 2 were classified as having

psychological distress. Information on viral load and antiretroviral therapy (ART) regimens was retrieved from patients' medical records. Participants who were unable to read were assisted by trained research assistants to complete the questionnaire.

Ethical Considerations

Ethical approval for the study was obtained from the Health Research Ethics Committee of Barau Dikko Teaching Hospital (Registration number NHREC/30/11/21A). Before enrolment, all participants were clearly informed about the purpose of the study, what participation would involve, and any potential risks or benefits, after which informed consent was obtained. Participation was completely voluntary, and participants were assured that they could decline or withdraw from the study at any time without affecting the care they received. Privacy and confidentiality were carefully protected, with personal identifiers removed and all information handled strictly for research purposes. The study was conducted in line with established ethical standards, with due respect for participants' dignity, safety, and rights throughout the research process.

Data Analysis

Data were analysed using SPSS version 25, employing descriptive statistics to summarise the variables and chi-square tests to examine associations between categorical variables. Statistical significance was determined at a p-value of less than 0.05. Findings were presented in the form of percentages, alongside chi-square statistics and corresponding p-values.

RESULTS

Sociodemographic and Clinical Characteristics

A total of 270 participants were enrolled in the study. A structured self-administered questionnaire was used for data collection. The mean age of respondents was 45.3 ± 12.5 years, with the majority falling within the 38–47 years age group. Females constituted 71.9 % of the study population. Most participants were on antiretroviral therapy for more than five years, and 94.8 % had achieved viral load suppression at the time of assessment. Skin disorders were identified in 139 participants (51.5 %)- Among those with skin disorders, the majority were female. The baseline sociodemographic and clinical characteristics of the participants are presented in Table 1.

Table 1: Baseline characteristics of study participants (n = 270)

Variable	Category	n (%)
Age group (years)	18–27	20 (7.4)
	28–37	52 (19.3)
	38–47	93 (34.4)
	48–57	64 (23.7)

Variable	Category	n (%)
Gender	Male	76 (28.1)
	Female	194 (71.9)
Skin disorder	Yes	139 (51.5)
	No	131 (48.5)
Viral load status	Suppressed	256 (94.8)
	Unsuppressed	14 (5.2)

Pattern of Skin Disorders

A wide range of dermatologic conditions was observed among participants with skin disorders. Papulosquamous disorders were the most prevalent category, accounting for 25.9 % of all dermatologic diagnoses. Pigmentary disorders (15.1 %) and eczematous dermatitis (12.9 %) were also commonly identified. Infectious dermatoses, including fungal, bacterial, and viral infections, collectively accounted for a substantial proportion of cases (33 %). Less common conditions included acne, hair disorders, infestations, benign neoplasms, and a small number of autoimmune, drug-related, and mucocutaneous disorders. The detailed distribution of skin disorder types is summarised in Table 2.

Table 2: Distribution of skin disorder types among participants with dermatologic manifestations (n = 139)

Skin disorder type	n (%)
Papulosquamous disorders	36 (25.9)
Pigmentary disorders	21 (15.1)
Eczematous dermatitis	18 (12.9)
Fungal infections	14 (10.1)
Benign neoplasms	13 (9.4)
Bacterial infections	10 (7.2)
Viral infections	9 (6.5)
Acne	4 (2.9)
Hair disorders	3 (2.2)
Miscellaneous	3 (2.2)
Infestations	2 (1.4)
Other disorders†	3 (2.2)

†Includes genetic, vascular, mucocutaneous, urticarial, autoimmune and drug-related disorders.

Association with Viral Load and ART Regimen

The presence of skin disorders was significantly associated with viral load status. Participants with unsuppressed viral loads were more likely to have skin disorders compared with those who were virologically suppressed ($\chi^2 = 6.928$, $df = 1$, $p = 0.008$). 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. A statistically significant association was also observed between antiretroviral therapy 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. Skin disorders were more frequently observed among participants receiving protease inhibitor-based regimens compared with those on dolutegravir-based therapy. The distribution of skin disorders according to the ART regimen is presented in Table 3.

Table 3: Association between antiretroviral therapy regimen and presence of skin disorders

ART Regimen	Skin disorder		Total n (%)
	Present n (%)	Absent n (%)	
TDF/3TC/DTG	128 (50.2)	127 (49.8)	255 (94.7)
ABC/3TC/ATVr	3 (75.0)	1 (25.0)	4 (1.5)
TDF/3TC/LPVr	1 (100.0)	0 (0.0)	1 (0.4)
TDF/3TC/ATVr	6 (100.0)	0 (0.0)	6 (2.2)
AZT/3TC/ATVr	1 (100.0)	0 (0.0)	1 (0.4)
TDF/3TC/DRV	0 (0.0)	3 (100.0)	3 (1.1)
Total	139 (51.7)	131 (48.3)	270 (100.0)

TDF = tenofovir disoproxil fumarate; 3TC = lamivudine; DTG = dolutegravir; ABC = abacavir; ATVr = atazanavir/ritonavir; LPVr = lopinavir/ritonavir; DRV = darunavir.

$$\chi^2 = 11.777, df = 5, p = 0.038$$

Psychological Distress

Psychological distress, as assessed by a GHQ-12 score of 3 or more, was identified in 32 participants, representing 12.0 % of the study population, as shown in Table 4. Among participants with dermatologic manifestations, psychological distress was more frequently observed compared with those without skin disorders, the association was not statistically significant ($\chi^2 = 1.70$, $df = 1$, $p = 0.192$).

Table 4: Association between psychological stress and presence of skin disorders (n=270)

Psychological distress	Skin disorder		
	Present n (%)	Absent n (%)	Total n (%)
Present	21 (15)	12 (9)	33 (12)
Absent	118 (85)	119 (91)	237 (88)
Total	139 (51.7)	131 (48.3)	270 (100.0)

DISCUSSION

This study reaffirms that skin disorders remain a significant and persistent clinical challenge among people living with HIV, notwithstanding the substantial advances achieved with the widespread availability and use of antiretroviral therapy (ART). While ART has markedly reduced the incidence of many opportunistic infections and improved overall immune function, dermatological conditions continue to represent an important source of morbidity, discomfort, and reduced quality of life for affected individuals.

In this cohort, the occurrence of skin disorders was 51.5 %, a figure that is notably higher than those reported in several other studies conducted within Kaduna and in other regions of Nigeria, including Ilorin, Umuahia, and Lagos. Previous reports from these settings have documented prevalence rates ranging from approximately 27.9 % in Lagos (Akinkugbe, Balogun, and Ayanlowo, 2022) to 33.9 % in Ilorin (Shittu et al., 2016). The comparatively higher burden observed in the present study suggests that, despite therapeutic progress, skin infections and other dermatological manifestations remain highly prevalent among adults living with HIV in this environment.

This finding underscores the need for deliberate and sustained efforts to strengthen the identification, prevention, and management of skin disorders within HIV care programmes. Routine dermatological assessment, early recognition of skin conditions, and timely referral or treatment should be integrated more effectively into comprehensive HIV care, particularly in resource-limited settings where specialist dermatological services may be scarce.

It is important to note that this study was conducted exclusively among adults living with HIV. Consequently, the prevalence observed cannot be directly compared with the substantially higher rates reported in earlier studies that included children or mixed-age populations, such as the 78% prevalence documented in Kano (Yahya, 2022). Differences in study populations, age distribution, immune status, and healthcare access may partly account for these variations. Nonetheless, the findings highlight that skin disorders continue to pose a considerable clinical burden among adults living with HIV and warrant focused attention within ongoing HIV treatment and care strategies.

The predominance of females in this study, who constituted 71.9 % of the study population, reflects the gender distribution commonly observed in HIV care programmes in Nigeria and across much of sub-Saharan Africa. This pattern has been consistently attributed to a combination of epidemiological, social, and health-system factors. Women are biologically more susceptible to HIV infection, particularly in heterosexual transmission, and are often

more likely to engage with healthcare services due to reproductive health needs, antenatal care attendance, and prevention of mother-to-child transmission (PMTCT) programmes. Consequently, women are more frequently diagnosed, enrolled, and retained in HIV care, which may partly explain their higher representation in facility-based studies such as this one.

The very high proportion of participants who had achieved viral load suppression (94.8 %) is an important and encouraging finding. It suggests effective ART delivery, good treatment adherence, and robust programme performance within the study setting. This level of viral suppression aligns with global and national targets for HIV control and indicates that the majority of participants were benefiting optimally from therapy at the time of assessment. From a clinical and public health perspective, sustained viral suppression is associated with reduced HIV-related morbidity, improved survival, and decreased risk of onward transmission.

Among participants with skin disorders, the majority were female, a finding that mirrors the overall gender distribution of the study population rather than suggesting a clear gender-specific excess risk. This observation implies that the higher number of females with skin disorders is likely driven by their numerical predominance in the cohort rather than by sex alone as an independent determinant of dermatological morbidity. Nevertheless, it is also plausible that gender-related factors, such as differences in health-seeking behaviour, occupational exposures, cosmetic practices, or hormonal influences on skin physiology, may contribute to variations in the presentation and reporting of skin conditions among women.

Importantly, the coexistence of a high rate of viral load suppression with a substantial burden of skin disorders highlights that dermatological manifestations can persist even in the context of effective virological control. This underscores the multifactorial nature of skin conditions in people living with HIV, which may be influenced by past immunosuppression, chronic inflammation, ART-related effects, environmental factors, and co-existing infections. Overall, these findings reinforce the need for gender-responsive and comprehensive HIV care that not only prioritises viral suppression but also systematically addresses non-life-threatening yet clinically significant conditions such as skin disorders, which can adversely affect comfort, self-esteem, and quality of life. 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 (Oninla and Olasode, 2014; Khondker, 2019; Mohseni et al., 2023; Morrone, 2024; Elwan et al., 2025).

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-and-effect relationship, it does raise important questions about drug tolerability and potential side effects associated with long-term ART use. Studies have documented dermatologic adverse effects with certain ART regimens, including drug-induced rashes, hypersensitivity reactions, and pigmentary changes (Borrás-Blasco, 2008; Vellaisamy, 2023; Jarang, 2024). 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 (Freeman et al., 2007).

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 (Kelly et al., 1998; Guan et al., 2022). These findings emphasize 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 cross-sectional study is limited by its inability to establish causal or temporal relationships between HIV-related factors and skin disorders. The single time-point assessment may not fully capture the fluctuating nature of dermatological conditions over time. As a facility-based survey, the findings may be affected by selection bias and may not be generalisable to people living with HIV who are not engaged in care. Reliance on self-reported data introduces the potential for recall and social desirability bias. At the same time, unmeasured factors such as environmental influences, comorbidities, and cumulative ART exposure may have contributed to residual confounding.

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 occurrence 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.

Declarations

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