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Clinical Medicine Insights: Dermatology

The Prevalence and Pattern of Skin Disorders at a University Teaching Hospital in Ile-Ife and Ilesha, Nigeria

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ABSTRACT

BACKGROUND: The WHO recommends increased priority given to dermatoses in developing countries as they cause high morbidity and impacts quality of life. This study is to determine the prevalence and pattern of skin disorders in adults presenting to dermatologists at OAU Teaching Hospitals' Complex (OAUTHC).

MATERIALS AND METHODS: This is a prospective study based on age, sex, and dermatological condition of new patients at OAUTHC Dermatology Clinics in Ile-Ife and Ilesha, Osun State, from October 2009 to September 2012. The results were compared with other geographical zones in Nigeria and Africa.

RESULTS: A total of 1013 patients were studied, with ages 18–90 years, 55% were women. Prevailing dermatoses were dermatophytes (9.8%), acne (9.5%), pityriasis versicolor (4.6%), warts (3.8%), lichen planus (3.7%), and seborrheic eczema (3.6%).

CONCLUSION: Dermatoses mostly presenting to dermatologists in Nigeria and Africa were skin infections and eczemas. Concerted effort need to be made to control these conditions.

KEYWORDS: skin, disorders, dermatoses, dermatology, prevalence, pattern

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Introduction

A high prevalence of skin diseases (21–87%) has been reported from developing countries all over the world by WHO.[1] Skin diseases thus constitute a major health problem in these countries. They are associated with high morbidity although mortality is low.[2] Many are accompanied by psychological disturbances and produce low quality of life.[3,4] Since, skin problems are a great cause of morbidity and sometimes mortality as well as the cause of a majority of hospital consultations,[5,6] reducing the burden will ensure a high level of health status in the populace and reduced health expenditures.[7]

Dermatological disorders often accompany other medical disorders.[8] Although some can be identified and managed by general physicians (GPs), skill is required in the diagnosis and management of many of these conditions.[9] Hence, dermatologists are important in the management of these conditions. The study period covered all the seasonal periods in the area so that the pattern studied will be inherent in the area and not influenced by seasonal variability.[10–12]

The occurrence of more than one skin disease in nearly 10% of this study population suggests that skin disorders may be very common among the larger populace. Prevalence of skin diseases varies within African communities from 35% to

values as high as 87%.[5,13–15] There is a need to study skin diseases among the general populace in this area. This will ensure good health policy and adequate health delivery to the people concerning skin diseases.

Materials and Methods

Study design and setting. This was a prospective and descriptive cross-sectional study of consecutive patients referred from October 2009 to September 2012 to the Dermatology and Venereology Clinics of Obafemi Awolowo University Teaching Hospitals' Complex in the cities of Ile-Ife and Ilesha, Osun State. This is a tertiary hospital receiving referrals from primary health centers, secondary health care facilities and private practitioners' in peripheral hospitals in surrounding cities and towns. Ethical approval for the study was obtained from Obafemi Awolowo University Teaching Hospitals' Complex (OAUTHC), Ile-Ife, Osun State Ethical and Research Committee. The research was conducted in compliance with the principles of the Declaration of Helsinki.

Clinical evaluation. Information on age, gender, residential address, and presenting complaints were recorded. A thorough physical examination of the patient and the skin lesions presented was carried out. The clinical findings were documented. Dermatological diagnoses were made mainly on clinical grounds and confirmatory laboratory investigations were carried out when necessary. Bacteriological, mycological, parasitological, or histological studies were performed as appropriate.

Data analysis. Data were analyzed using Statistical Package for Social Sciences (SPSS) Statistics version 16.0 (SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.) and presented as numerical data in frequency tables. Classification of disorders was made using International Classification of Diseases (ICD) version 10.

Results

There were a total of 1013 new patients studied within the study period of October 2009–September 2012. This comprises 456 men and 557 women (ratio of 1:1.2) with ages ranging between 18 and 99 years and a mean age of 37 years.

At least one recognizable skin lesion was found in 929 (91.7%) patients, whereas 78 (7.7%) had two disorders each, 5 (0.5%) had three, and 1 (0.1%) had four different skin disorders. Therefore, a total of 1097 different skin lesions were found in all the patients. The skin lesions were grouped according to ICD-10 with little modification.

Skin infections and infestations were the commonest dermatoses, and their frequency are presented in Table 1A, while the non-infective conditions are listed in Table 1B.

Skin disorders according to groups using modified ICD-10 are shown in Figure 1. The commonest 20 dermatoses making up 68.5% of the total dermatoses are shown in Figure 2.

Disorders grouped together as "others" and occurring with a frequency of 1 are ingrowing toe nails, lymphangioma circumscriptum, pellagra, angular cheilitis, pearly penile papules, proteus syndrome, xanthoma, and xanthogranuloma, whereas those with the frequency of 2 are acanthosis nigricans, callosity, pruritic urticaria papules and plaques of pregnancy, somatoform disorder, striae distensae, and xanthelasma.

Table 1A. Skin and subcutaneous tissue infections/infestations using ICD-10.

INFECTIONS/INFESTATIONS OF THE SKIN AND SUBCUTANEOUS TISSUE			
INFECTIONS/INFESTATIONS		**TOTAL**	**% TOTAL**
Viral	Viral warts	42	3.8
	Viral exanthem	2	0.2
	Chicken pox	4	0.4
	Herpes labialis	2	0.2
	Herpes zoster	15	1.4
	Morbiliform rash	1	0.1
Fungi	Candida intertrigo	22	2.0
	Pityriasis versicolor	50	4.6
	Dermatophytes	107	9.8
	Madura foot	3	0.3
Bacterial	Cellulitis	4	0.4
	Follicullitis/carbunculosis	19	1.7
	Impetigo contagiosum	2	0.2
	Erythrasma	1	0.1
	Hansen's disease	16	1.5
Parasitic	Scabies	5	0.5
	Elephantiasis	13	1.2
	Onchodermatitis	35	3.2
	Loiasis	5	0.5
Total		348	31.7

The various skin infections and infestations making up 32% of the disorders were the commonest group of skin disorders with predominant fungi infections. Eczema and dermatitis constituting 21% are the next group. The third group is disorders of skin appendages with 15%. Dermatophytic infections, pityriasis versicolor, viral warts, onchodermatitis, candidiasis, folliculitis/carbunculosis, Hansen's disease, herpes zoster, and elephantiasis are the top 10 infections and infestations. Of the non-infective disorders, the 10 most frequent disorders are acne vulgaris, lichen planus, seborrheic dermatitis, pruritus, scars, urticaria, pityriasis rosea, fixed drug eruption, vitiligo, and lichen simplex chronicus.

The pattern of skin disease presenting to the dermatologists here was compared with the pattern obtained by dermatologists from four of the six geographical zones of Nigeria in Table 2. Reports were not available from two zones. A similar comparison was also done in Table 3 using research conducted by dermatologists from West, East, North, and South of Africa. These studies presented in Tables 2 and 3 revealed the type of skin diseases presenting to dermatologists in Nigeria and Africa.

Table 1B. Non-infectious disorders of the skin and subcutaneous tissue (using ICD-10).

NON-INFECTIOUS DISORDERS		TOTAL	% TOTAL
Bullous	Dermatitis herpetiformis	1	0.1
	Pemphigus vulgaris	5	0.5
	Pemphigoid	1	0.1
Dermatitis and eczema	Seborrhoeic	40	3.6
	Contact dermatitis	27	2.5
	Other eczemas	56	5.1
	Pruritus	34	3.1
	Prurigo nodularis	4	0.4
	Lichen simplex chronicus	23	2.1
	Drug reactions	14	1.3
	Fixed drug eruption	26	2.4
Papulosquamous	Lichen nitidus	6	0.6
	Lichen planus	41	3.8
	Parapsoriasis	1	0.1
	Pityriasis rosea	28	2.6
	Psoriasis	17	1.5
Radiation	Actinic keratosis	1	0.1
Urticaria and erythema	Urticaria	31	2.8
	Angioedema	8	0.7
	Papular urticaria	20	1.8
	Erythema multiforme	2	0.2
Skin appendages	Acne vulgaris	104	9.5
	Alopecia	15	1.4
	Pseudofolliculitis barbae	3	0.3
	Sebaceous cyst	1	0.1
	Acne keloidalis nuchae	17	1.5
	Folliculitis keloidalis nuchae	1	0.1
	Hyperhidrosis	4	0.4
	Miliaria rubra	11	1.0
	Milia	1	0.1
	Steacystoma multiplex	2	0.2
	Dermoid cyst	1	0.1
OTHER DISORDERS			
	Acanthosis nigricans	2	0.2
	Callosity	2	0.2
	Discoid lupus erythematosus	8	0.7
	Mixed connective tissue disease	1	0.1
	Scleroderma	2	0.2
	Systemic lupus erythematosus	2	0.2
	Vasculitis	2	0.2
	Follicular hyperkeratosis	3	0.3
	Icthyosis vulgaris	5	0.5
	Keratodermas	7	0.6
	Leg ulcer	5	0.5
	Epidermal/melanocytic naevus	6	0.6
	Idiopathic hypomelanosis	5	0.5
	Post inflammatory hypo- and hyperpigmentation	17	1.5
	Vitiligo	25	2.3
	Phrynoderma	2	0.2
	Exogenous oochronosis	2	0.2
	Somatoform disorder	2	0.2
	Striae distensae	2	0.2
Tumours	Dermatofibroma	4	0.4
	Malignant melanoma	2	0.2
	Neurofibromatosis	4	0.4
	Basal cell carcinoma	2	0.2
	Squamous cell carcinoma	2	0.2
	Seborrhoeic keratosis	11	1.0
	Skin tags	4	0.4
	Syringoma	8	0.7
	Keloids	28	2.6
	Hypertrophic scar	3	0.3
	Xanthelasma	2	0.2
	Xerosis cutis	11	1.0
	Others	19	1.7
Total		749	68.3

Discussion

The use of ICD[16] for grouping skin disorders allows for comparison of these diseases, which are diverse in different localities and also reported by different researchers in variable patterns.

The commonest group of skin diseases in the dermatology clinic in this area of study, in south west Nigeria, was the skin infection and infestation. The prevalence of 32% was higher than the 21.4% in a similar study also in south west Nigeria (Ibadan).[17] It was the largest dermatoses (44.4%) in north-west (Sokoto), and second largest in both north-central (Kaduna) Nigeria (21.7%) and south-east (Enugu) (19.1%).[18–20] This implies that they affect about one-fifth or more of the study populations in the four different geographical regions. Therefore, skin infections and infestations remains a very common problem among the Nigerian populace.

Of similar relevance to it is eczematous diseases found in 21%. They occurred in 30.2% of patients in Ibadan. Other researches in Sokoto, Enugu, and Kaduna have recorded a high prevalence (14.1%, 24.9%, and 21.7%, respectively). Another study in south eastern Nigeria by dermatologists revealed that

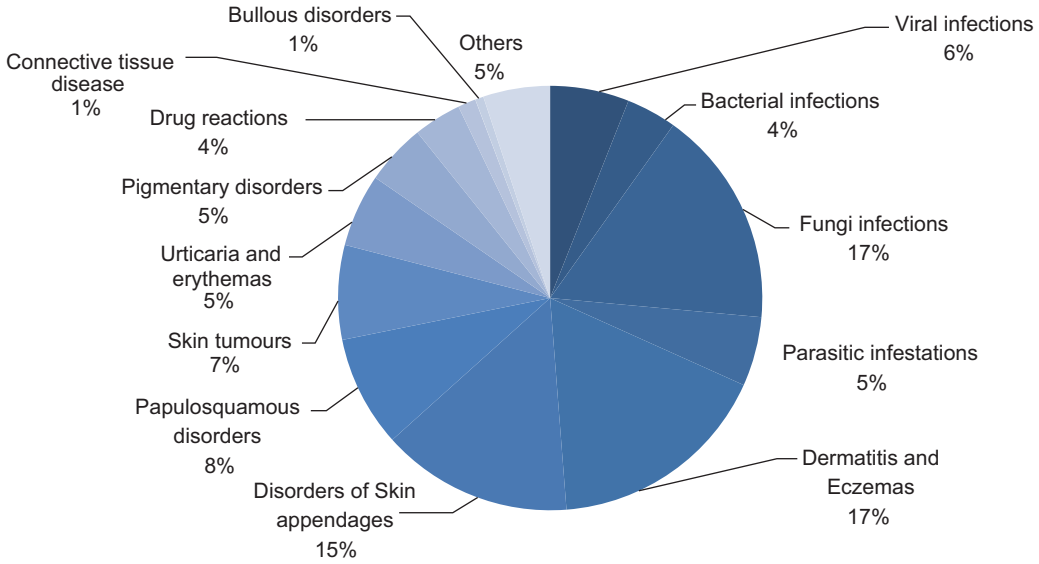

Figure 1. Pattern of dermatoses by categorical type.

infective dermatoses (67% were fungi infections) and eczemas accounted for more than half (57.5%) of all diagnosis.[21] This group of dermatoses also affects more than one-fifth of the patients with skin problems. Therefore, skin infections and infestations, and eczematous diseases constitute the largest number of skin diseases in Nigeria as reported by different dermatologists from all over the country. Skin infections and infestations are easily treatable, whereas most eczema will totally resolve the treatment.

The most frequent disorder by disease category was dermatophyte infection (9.8%). It was the commonest cause of skin infections in all previous studies in Nigeria mentioned above (4.5%, 8.3%, 13.4%, and 6% in Ibadan, Enugu, Sokoto, and Kaduna, respectively). This suggests that the climatic condition in a tropical country such as Nigeria favors the growth of dermatophytes. Acne vulgaris was next in frequency (9.5%). The finding here represents the highest frequency of acneiform eruptions documented in Nigeria. Reported frequencies were 2.8%, 6.9%, 6.7%, and 4.3% in Ibadan, Enugu, Kaduna, and Sokoto, respectively. This can be explained by the fact that students of many tertiary institutions within the same town access physician care in this hospital.

Pityriasis versicolor was next in sequence (4.6%). Occurrence was similar to the finding at Ibadan (4.5%), and more

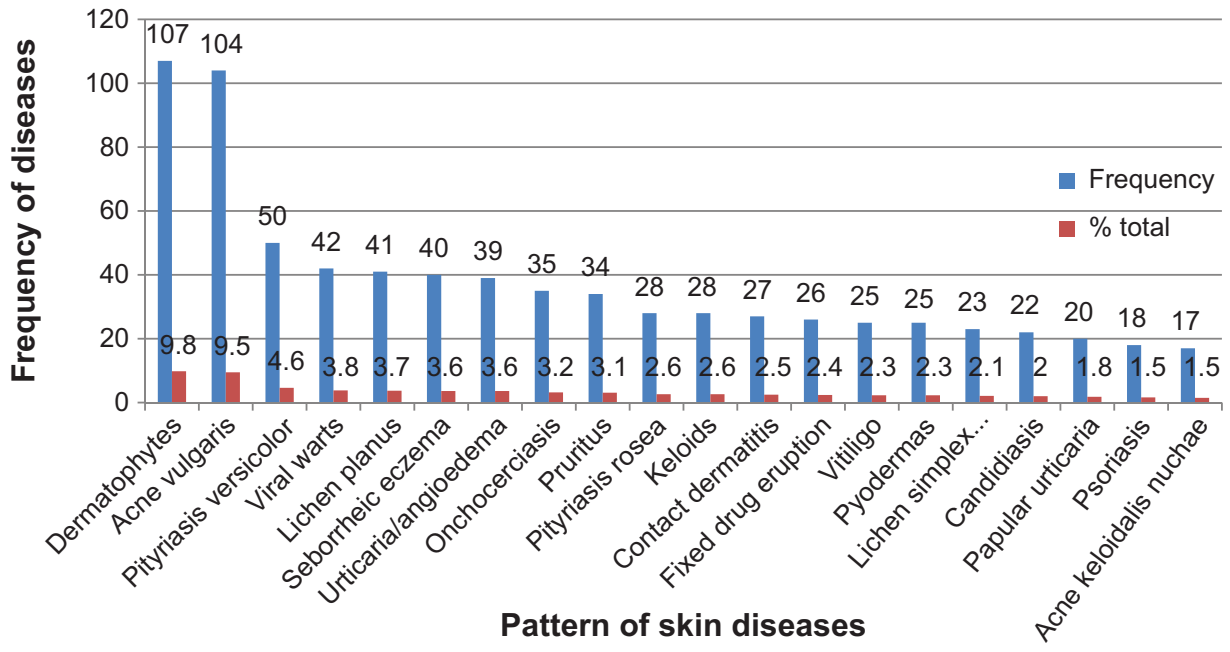

Figure 2. Frequency and pattern of skin disorders according to diagnoses.

Table 2. Comparison of first 20 dermatoses reported by dermatologists in different geographical zones in Nigeria.

PRESENT STUDY ILE-IFE/ILESHA 2009–2012 (*n* = 1013)		OGUNBIYI ET AL IBADAN 1994–1998 (*n* = 1091)		NNORUKA ENUGU 1999–2001 (*n* = 2871)		YAHYA KADUNA 2000–2005 (*n* = 5982)		ONAYEMI ET AL SOKOTO 1999–2001 (*n* = 900)	
DERMATOSES	**%**	**DERMATOSES**	**%**	**DERMATOSES**	**%**	**DERMATOSES**	**%**	**DERMATOSES**	**%**
Dermatophytes	9.8	Atopic eczema	5.8	Dermatophytes	8.3	Atopic dermatitis	13.8	Pityriasis versicolor	6.7
Acne	9.5	Vitiligo	5.7	Contact dermatitis	5.3	Acne vulgaris	6.7	Scabies	5.2
Pityriasis versicolor	4.6	Urticaria	4.6	Atopic dermatitis	4.8	Dermatophytes	6.0	Tinea corporis	5.0
Viral warts	3.8	Tinea versicolor	4.5	Lichen planus	4.8	Contact dermatitis	5.8	Candidiasis	4.9
Lichen planus	3.7	Ring-worm	4.5	Acne vulgaris	4.3	Urticaria	3.6	Acne vulgaris	4.3
Seborrhoeic eczema	3.6	Pruritus	4.2	Pityriasis rosea	4.1	Papular urticaria	3.5	Seborrheic eczema	4.0
Urticaria/ Angioedema	3.6	Scabies	4.2	Acne keloidalis nuchae	3.7	Lichen simplex chronicus	3.0	Lichen simplex	3.9
Onchocerciasis	3.2	Alopecia	3.4	Pseudofolliculitis barbae	3.4	Viral wart	2.9	Urticaria	3.7
Pruritus	3.1	Lichen planus	3.4	Seborrhoeic dermatitis	3.3	Candidiasis	2.8	Bacterial folliculitis	3.1
Pityriasis rosea	2.6	Seborrheic dermatitis	2.9	Vitiligo	3.2	Pityriaisis versicolor	2.4	Viral warts	2.9
Keloids	2.6	Acne keloidalis	2.9	Lichen simplex chronicus	2.7	Palmo-plantar hyperkeratosis	2.2	Vitiligo	2.8
Contact dermatitis	2.5	Acne vulgaris	2.8	Urticaria	2.3	Seborrheic dermatitis	2.1	Tinea capitis	2.7
Fixed drug eruption	2.4	Connective tissue disease	2.5	Pyodermas	2.3	Pityriasis rosea	2.1	Tinea pedis	2.7
Vitiligo	2.3	Fixed drug eruption	2.2	Scabies	1.9	Vitiligo	2.0	Allergic contact dermatitis	2.2
Pyodermas	2.3	Drug eruption	2.2	Connective tissue diseases	1.9	Discoid eczema	1.4	Chicken pox/ herpes zoster	2.1
Lichen simplex chronicus	2.1	Warts	2.0	Pityriasis versicolor	1.7	Scalp folliculitis	1.4	Lichen planus	1.9
Candidiasis	2.0	Candidiasis	1.9	Discoid eczema	1.5	Psoriasis	1.2	Acne keloidalis nuchae	1.9
Papular urticaria	1.8	Palmoplantar hyperkeratosis	1.9	Onchocerciasis	1.4	Lichen planus	1.2	Molluscum contagiosum	1.6
Acne keloidalis	1.5	Pityriasis rosea	1.6	Pruritic papular eruptions	1.4	Molluscum contagiosum	0.8	Pityriasis rosea	1.6
Psoriasis	1.5	Keloids	1.5	Papular urticaria	1.3	Pityriasis alba	0.8	Psoriasis	1.2
Total	68.5	Total	62.7	Total	63.6	Total	65.7	Total	64.4
Others	31.5	Others	37.3	Others	36.4	Others	34.3	Others	35.6

common than that in Enugu (1.7%) and Kaduna (2.4%). It was most common in Sokoto (6.7%). Sokoto is a city close to the Sahara desert with very high temperature and humidity, and this may explain the high rate of fungi infections such as pityriasis versicolor and dermatophytes.

The finding of skin infections as the most common group of skin disorders was similar to reports from dermatologists in Ghana, South Africa, and Tunisia, and was next to eczema in Ethiopia.[22–25] Skin infections made up 22–46% of the dermatoses seen by these dermatologists. The frequency of 32% obtained in this study was within this range. This implies that skin infections are rampart in many African countries. As they are treatable, appropriate health policy in their prevention and management need to be put in place.

Eczematous skin conditions were the next most common diseases with the exception of the study at Ethiopia where they were only slightly more common than infections (a difference of only 0.1%). This group of disorders has been reported to be on the rise in developing countries due

Table 3. Comparison of pattern of skin disorders at dermatology clinics in four regions of Africa.

PRESENT STUDY	%	GHANA	%	TUNISIA	%	ETHIOPIA	%	SOUTH AFRICA	%
Infections	31.7	Infections	46.3	Infections	38.60	Infections	25.4	Eczema	31.2
Eczemas	17.0	Dermatitis	18.4	Hair/sebaceous gland disorders	14.30	Photo-dermatoses	22.9	Infections	22.1
Disorders of Skin appendages	14.6	Generalized pruritus	10.5	Allergic disorders	13.60	Dermatitis (excluding seborrhoeic)	22.1	Acne	16.0
Papulo-squamous disorders	8.5	Autoimmune	5.0	Tumors	7.80	Acne/rosacea/ perioral dermatitis	5.8	Benign tumours	5.9
Skin tumours	7.2	Acne and acne rosacea	4.6	Keratinization disorders	5.40	Seborrhoeic dermatitis	3.4	Psoriasis	2.9
Urticaria/erythemas	5.6	Urticaria	4.4	Pigmentary disorders	4.70	Pruritus	3.2	Malignant tumours	2.8
Pigmentary disorders	4.6	Drug reactions	3.6	Vascular disorders	1.70	Lichen planus/ psoriasis	2.2	Urticaria	1.8
Drug reactions	3.6	Hair disorders	1.2	Drug reactions	0.70	Urticaria	1.9	Vitiligo	1.2
Connective tissue disease	1.4	Pigmentary disorders	1.0	Auto-immune disorders	0.50	Drug reaction	1.5	Chloasma	1.2
Bullous disorders	0.6	Skin tumors	1.0	Genodermatoses	0.22	Collagenoses	0.1	Lupus erythematosus	1.1
Others	5.1	Others	4.0	Others	12.48	Others	10.8	Others	13.8

to increasing urbanization.[26,27] Acne and other disorders of skin appendages were the third to fifth most common dermatoses in this study and all the other countries. Acne (due to increase in androgen levels and the resultant increase in sebaceous activity) is known to have a high prevalence worldwide affecting 90% of teenagers with symptoms continuing till adulthood with 1% of men and 5% of women affected by the age of 40 years.[28,29]

Although papulosquamous diseases were present in 8.5% in this study, it was relatively less common in the first 10 group of dermatoses in reports from other African countries. Only 0.4% of psoriasis alone, 2.2% lichen planus/psoriasis, 3.4% psoriasis, and 2.9% psoriasis were reported in the Ghanaian, Tunisian, Ethiopian, and South African researches, respectively. The frequencies in Sokoto (1999–2001), Kaduna (2000–2005), Enugu (1999–2001), and Ibadan (1994–1998) were 6.4%, 4.5%, 10.7%, and 10.6%, respectively. Lichen planus was found in 3.7% of patients. It was also the most common papulosquamous disease in almost all geographical zones in Nigeria. However, it was uncommon in dermatology clinics of the other African countries. Pityriasis rosea was next with a frequency ranging from 1.6 to 4.1% of dermatological conditions seen. Psoriasis was much less in this country—a tropical country than what obtains in Tunisia and Southern Africa which are temperate countries. It has been reported to affect less people in the tropics (particularly West Africans) than temperate regions.[30] Hence, papulosquamous diseases (predominantly lichen planus) are more common in Nigeria than other African countries. Further study will be required to determine the factors responsible for this.

Skin tumors, mostly benign, were high in occurrence in this study (7.2%). This is similar to findings in the Tunisia and South Africa research. Most (41.2%) of the swellings were keloidal scar which also constituted 2.6% of all the dermatoses. Frequency was between 0.7 and 3.5% of skin diseases at other dermatology centers' in Nigeria. In the South African study, most (88.6%) of the keloids seen occurred in the black patients. Blacks form keloids 15 times more frequently than light-skinned individuals.[31] Malignant tumors were of low frequency. They have been reported as being of low prevalence in Africans.[32,33]

Urticaria, allergic reactions, and drug reactions occurred uniformly in all these studied countries within the first 10 dermatoses. This implies that skin sensitization by various chemical or environmental pollutants are rampart within the continent. This most probably could be a result of urbanization with increasing chemical or biologic pollutants.

Regulatory policies will need to be in place for effective monitoring and control of drugs, cosmetics, food additives, and chemicals used in household products such as detergents, soaps, and cleansing fluids in order to reduce eczemas, allergies, and drug reactions. Many of these products abound in the Nigerian markets without certification by the National Agency for Food and Drug Administration and Control (NAFDAC).

For the control of skin infection and infestations, personal and environmental hygiene needs to be improved. This can be achieved through health education in schools, commercial centers, workplaces, and better environmental sanitation practices. Provision of affordable housing to reduce overcrowding, portable water, and waste disposal systems is of priority in controlling skin infections and infestations as these have been reported as factors contributing to these diseases.[34,35] Achieving these has been an uphill task for many developing countries. Nigeria needs to pursue the millennium development goals

with appropriate monitoring and evaluation policies. These will go a long way in reducing skin infections and infestations that are rampart in different parts of the country.

A limitation of this study is that most common dermatological conditions are treated by the GPs. Referrals may be cases that are recalcitrant to treatment, difficult to diagnose, or recurring. Hence, the study may not reflect the exact pattern in the general populace. Survey of the burden of skin diseases in the community is, therefore, necessary to ascertain the true prevalence of these diseases. Also, definitive diagnoses could not be confirmed due to lack of specialized dermatology laboratories for tests such as antinuclear antibody tests for connective tissues diseases, genetic studies of genodermatoses, and immunofluorescent studies of blistering disorders.

Conclusion

Skin disorders are very common and diverse in different geographical locations. However, this study revealed that skin infections particularly fungi diseases (dermatophytosis and pityriasis versicolor) and eczematous disorders were rampart in Ile-Ife/Ilesha, in Nigeria and other African countries. The finding of similar diseases implies that there are similar prevailing conditions which need to be changed or modified to reduce their prevalence. Dermatological education through training of health care workers about these conditions will also help in their control.

Author Contributions

Conceived and designed the experiments, analyzed the data, and wrote the first draft of the manuscript: OA Oninla. Contributed to the writing of the manuscript: OA Oninla, OA Olasode, AAA, and OO. Agree with manuscript results and conclusions: OA Oninla, OA Olasode, OO, and AAA. Jointly developed the structure and arguments for the paper: OA Oninla, OA Olasode, AAA, and OO. Made critical revisions and approved final version: OA Oninla, OA Olasode, OO, and AAA. All authors reviewed and approved of the final manuscript.

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