



## Gender Differences in Dermatoses at Obafemi Awolowo University Teaching Hospitals' Complex, Ile-Ife

Olumayowa Abimbola Oninla<sup>1\*</sup>, Samuel Olorunyomi Oninla<sup>2</sup>,  
Olaide Olutoyin Oke<sup>3</sup>, Mufutau Muphy Oripelaye<sup>1</sup>, Fatai Olatunde Olarewaju<sup>1</sup>  
and Olufikemi Titilola Fabusuyi<sup>1</sup>

<sup>1</sup>Department of Dermatology and Venereology, OAU, Ile-Ife, Osun State, Nigeria.

<sup>2</sup>Department of Paediatrics and Child Health, Ladoke Akintola University of Technology, Osogbo, Osun State, Nigeria.

<sup>3</sup>Department of Internal Medicine, Dermatology Unit, Federal Medical Centre, Abeokuta 110222, Nigeria.

### Authors' contributions

*This work was carried out in collaboration between all authors. Author OAO conceived and designed the study, analyzed the data and wrote the first draft of the manuscript. Author SOO contributed to the writing of the manuscript and analysis of the data. Authors OOO, MMO, FOO and OTF were involved in the collection of data and contributed to the writing up of the manuscript. Authors OAO, SOO and OOO agreed with manuscript results and conclusions and jointly developed the structure and arguments for the paper. All authors read and approved the final manuscript.*

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### ABSTRACT

**Aims:** The aim of this study was to determine the dermatoses associated with gender in this geographical area.

**Study Design:** A descriptive cross-sectional survey.

**Place and Duration of Study:** Dermatology Clinics of OAU Teaching Hospitals' Complex (OAUTHC), Ile-Ife, Osun State, Nigeria between October 2009 and September 2012.

\*Corresponding author: E-mail: mayooni@yahoo.com;

**Methodology:** Recruitment of consecutive patients presenting with skin diseases was done on two days in a week during the study period. Demographic data on age, gender and symptoms were taken, and the diagnosis of presenting skin conditions documented. The results were analyzed using Statistical Package for Social sciences (SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc). The Odds ratio of dermatological diseases for both genders was obtained using WINPEPI 11.0 with 95% confidence interval and p value of 0.5 signifying a significant relationship between the dermatosis and gender type.

**Results:** Patients studied were 1013, aged 18-90 years, and 55% females. The male gender was significantly associated with acne keloidalis nuchae, folliculitis/carbunculosus, seborrhoeic eczema, lichen simplex chronicus, and Hansen's disease. Drug reactions, seborrhoeic keratosis, miliaria rubra, and papular urticaria were, however, the only significant diseases in females.

**Conclusion:** Certain skin diseases are indeed significantly associated with gender. For some of these diseases, differences in the biophysical profile of the male and female have been found responsible. Other factors such as occupation predisposing to gender predilection will need to be further elucidated.

*Keywords: Gender differences; dermatoses; skin problems; Ile-Ife and Ilesha.*

## 1. INTRODUCTION

Gender predilection is known for many skin diseases while many do not have any known relationship with it [1]. The study of skin diseases is often related to age groups and environmental factors while a gap remains for some skin diseases as to their relationship to gender. A dearth of information exists in this country about gender differences in dermatoses. Many prevalent studies in this country report the proportion of male and female in the study population but do not present the skin diseases found with gender.

Differences in the structures and functions of the skin in both genders underline the gender differences observed in many skin diseases [1-5]. Gender-related differences in human skin begin at puberty as a result of hormonal changes most especially increased androgen secretions, and in particular, testosterone. The hormonal changes results in structural changes found in the male skin, such as, an increase in collagen fibres in the dermis [6]. The physiological properties of the skin also remains the same in both genders until hormonal secretions begins, with changes in trans epidermal water loss (TEWL), stratum corneum hydration (SC hydration), sebum content, and pH value being noted to be associated with gender [7-10].

The knowledge and understanding of the physiological, chemical, and biophysical properties of the skin in both genders are necessary for appropriate diagnoses and management of skin diseases. Gender susceptibility to various skin diseases, such as acne, rosacea, pseudofolliculitis barbae, and

seborrhoeic eczema, had been documented in developed countries but not adequately in this environment. The relationship of these skin diseases to the differences in skin physiology in both genders has also not been investigated.

The aim of this study was to determine the association between gender and dermatoses in this geographical area.

### 1.1 Objectives

- i.) To identify the dermatoses occurring in each gender.
- ii.) To determine the association between gender and dermatoses.

## 2. METHODOLOGY

### 2.1 Study Design and Setting

Consecutive patients with skin diseases presenting to the Dermatology and Venereology Clinics of Obafemi Awolowo University Teaching Hospitals' Complex (OAUTHC) in Ile-Ife and Ilesha, Osun State, were recruited into a descriptive cross-sectional study of their skin diseases.

The teaching hospital sub-serves surrounding cities, towns, and states for specialist care in Dermatology and Venereology as well as primary health centers, secondary health care facilities and private practitioners' in the state. The study was conducted in some of the patients who presented to the dermatology clinics which run on two different days in a week at each of the Hospitals (Ile-Ife and Ilesha) from October 2009 to September 2012.

### 3. MATERIALS AND METHODS

Demographic data on age, gender, symptoms of skin diseases, skin examination findings, and diagnoses was documented. Laboratory investigations such as bacteriological, mycological, parasitological or histological studies were carried out for confirmation when necessary. HIV seropositive patients were excluded from the study.

International Classification of Diseases (ICD) version 10 was used in categorizing the skin disorders observed. Results were tabulated, and frequency calculated using statistical package for social sciences (SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.).

The Odds ratio of the proportion of each dermatological diagnosis for both genders was obtained using WINPEPI (Abramson, J.H. WINPEPI updated: computer programs for epidemiologists, and their teaching potential. *Epidemiologic Perspectives & Innovations* 2011, 8:1), and 95% confidence interval with P value = .05 were used to obtain diseases significant with each gender.

### 4. RESULTS

The number of patients studied was 1013 with their age ranging from 18 to 90 years. There were 456 males (45%) and 557 (55%) females. There were 1097 dermatoses in all the patients; 502 (45.8%) in male gender group and 595 (54.2%) in the female group. Non-infectious dermatoses (749; 69.3%) accounted for majority of the type of skin diseases found while about one-third were skin infections (348; 31.7%) with 178 (51%) occurring in females. The non-infectious dermatoses were also more common in the female gender (417; 55.7%)

The dermatoses found in the males were mostly fungal infections (most commonly dermatophytes then pityriasis versicolor), dermatitis (most commonly seborrheic then contact), acne vulgaris, viral warts, and pruritus. However, only acne keloidalis nuchae, viral warts, folliculitis/carbunculus, Hansen's disease, elephantiasis, seborrheic eczema, and lichen simplex chronicus (neurodermatitis), were significantly more among the male gender.

The most common diseases seen in females were fungal infections, dermatitis, acne vulgaris, lichen planus, onchodermatitis. Infections such

as herpes zoster, candida intertrigo/paronychia, onchodermatitis were more frequent though not significantly so in females (with 67%, 68% and 63% respectively occurring in them).

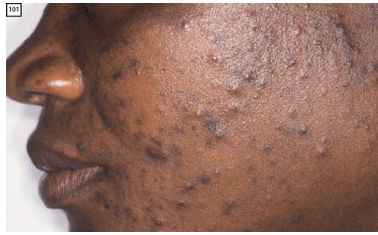
Drug reactions, seborrheic keratosis, miliaria rubra, papular urticaria were, however, the only diseases significantly associated with the female gender. Table 1 shows skin and subcutaneous tissue infections/infestations according to gender. Tables 2A, and 2B shows non-infectious disorders of the skin and subcutaneous tissue according to gender. Pictures 1-10 show the different types of dermatoses in both genders.

### 5. DISCUSSION

Only one study [11] among prevalent studies of dermatoses by dermatologists (also in the Southern part of Nigeria) documented the prevalence of dermatoses according to gender. Comparison of the dermatoses was carried out using frequencies. In this study, the most common skin diseases among men were fungal infections, dermatitis, pigmentary disorders, pruritus, urticaria, acne vulgaris, viral warts, lichen planus, drug eruptions, sycosis/folliculitis, and psoriasis. Dermatoses in females according to their frequencies were dermatitis, fungal infections, pruritus, urticaria, pigmentary disorders, lichen planus, viral warts, pityriasis rosea, papular urticaria, acneiform eruptions and connective tissue disease.

Analysis of the study by Altraide et al. showed that pigmentary disorders (P = 0.014, OR=1.69; 95% CI=1.12 to 2.55), sycosis/folliculitis (P = 0.001, OR = 4.99; 95% C.I. = 1.82 to 13.69) and viral warts (P = 0.016; OR= 2.34; 95% CI= 1.20-4.56) were significantly associated with the male gender. However, only lichen planus (P=0.043; OR= 0.54; 95% CI= 0.30-0.97), connective tissue diseases (P = 0.027; OR= 0.41; 95% CI= 0.19-0.89), and pityriasis rosea (P= 0.023 OR= 0.46; 95% CI=0.23-0.90) were of significance in females. Similarities in both studies are folliculitis/sycosis, and viral warts being significant in males while findings in females were dissimilar.

Though study reports on gender differences in dermatoses are few and far between, some still document the prevalence according to gender. Females were slightly more than males in this study (51.1%). In many studies of skin diseases presenting to dermatologists in Nigeria, there is usually a female preponderance [12,13].



**1. Acne vulgaris (female)**



**2. Acne vulgaris (male)**



**3. Herpes zoster (male)**



**4. Contact dermatitis (male)**



**5. Vitiligo (female)**



**6. Alopecia areata (male)**



**7. Psoriasis- chronic plaque (female)**



**8. Pemphigus vulgaris (male)**



**9. Discoid lupus erythematosus (female)**



**10. Large Keloid (female)**

**Pictures 1-10. Pictures of skin diseases in both genders**

**Table 1. Skin and subcutaneous tissue infections/infestations according to gender and using ICD-10**

Infections/infestations of the skin and subcutaneous tissue	Gender		Total	Odds ratio	95% CI*	P value
	Male	Female				
<b>Viral:</b>						
viral warts	26	16	42	2.04	1.08 to 3.86	.03*
viral exanthem	0	2	2	0.24	0.01 to 5.07	.50
chicken pox	1	3	4	0.41	0.04 to 3.91	.63
herpes labialis	2	0	2	6.13	0.29 to 27.71	.20
herpes zoster	5	10	15	0.61	0.21 to 1.79	.44
morbiliform rash	0	1	1	0.41	0.02 to 9.97	.99
<b>Bacterial:</b>						
cellulitis	1	3	4	0.41	0.04 to 3.91	.63
folliculitis/carbunculosus	15	4	19	4.70	1.55 to 14.25	.0001*
impetigo contagiosum	0	2	2	0.24	0.01 to 5.07	.50
erythrasma	0	1	1	0.41	0.02 to 9.97	.99
Hansen's disease	12	4	16	3.74	1.20 to 11.65	.02*
candida intertrigo	7	15	22	0.56	0.23 to 1.39	.28
pityriasis versicolor	24	26	50	1.13	0.64 to 2.00	.67
dermatophytic infections	46	61	107	0.91	0.61 to 1.37	.68
madura foot	2	1	3	2.45	0.22 to 27.04	.59
<b>Parasitic:</b>						
scabies	3	2	5	1.84	0.31 to 11.03	.66
elephantiasis	10	3	13	4.14	1.13 to 15.12	.02*
onchodermatitis	13	22	35	0.71	0.36 to 1.43	.35
loiasis	3	2	5	1.84	0.31 to 11.03	.66
Total	170	178	348			

\*CI = 95% Confidence interval

However, in a few dermatology centers, a slightly higher ratio of male to female cases was seen [14,15]. Several studies across different regions of Africa (Tunis, South Africa, Sierra Leone, and Ethiopia) also showed that females present more to dermatologists for skin problems [16-19]. The reason can be adduced from the fact that the majority of the patients are usually in the younger age group and would, therefore, present for cosmetic reasons.

Infections by dermatophytes are usually the most prevalent infection in Nigeria [11]. Tinea infections were found to have a significant association with gender in this study. Tinea corporis and unguium were found to affect females more than males. A similar outcome was reported in Port-Harcourt [11]. The uncommon finding of tinea pedis in more females in the present study and an almost equal proportion between both gender by Altraide et al. [11] suggest that this condition is very common among women in this country. Tinea corporis, cruris, pedis and unguium have been reported as conditions usually affecting males [20] while tinea capitis and corporis occur with the same frequency in both gender in another study [21].

Tinea capitis is known to be more common in children than in adults [22]. Hence, few cases are seen in adults.

Seborrheic dermatitis is a chronic, superficial, inflammatory condition affecting hairy regions of the body, especially scalp, eyebrows, and face. A significant association was found with the male gender which is similar to report by Del Rosso [23]. Men are affected more probably because androgen controls secretions by the sebaceous gland.

Studies by Olumide in Lagos, an urban area in Nigeria, revealed that contact dermatitis often affects men than women and children [24]. Most of the culpable substances are used in their occupations. There was no gender predominance observed in this study though Altraide reports a female predominance (in a dermatology centre serving an urban populace) probably attributable to contact with irritants or allergic substances in cosmetics or washing detergents used for housekeeping [11]. Stasescu et al. reported that a high incidence mostly due to occupational dermatitis occurred in women [25].

Acne occurs in both gender, but more frequently males are affected more than females due to higher androgen level [26]. In this study, more women than men presented with acne. The reason for this may be cosmetic use or use of skin bleaching agents containing steroids. On a global scale, the rate among females remains higher than males [27]. Women are also more likely to seek professional care for acne than men [28].

Viral warts are common in this country making up about 30-65% of viral infections seen by dermatologists here [29]. It constituted 64% of viral infections seen in this study. Sudhakar et al. [30] reported that viral warts occurred significantly in the male gender with a male to female ratio of 6.7:2.3. An equal predilection for both male and female has also been reported [31]. This study showed a significant male predominance in the prevalence that is similar to finding by Altraide et al. [11].

**Table 2A. Non-infectious disorders of the skin and subcutaneous tissue according to gender using ICD-10**

<b>Non-infectious disorders of the skin and subcutaneous tissue</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Odds ratio</b>	<b>95% CI*</b>	<b>P value</b>
<b>Bullous:</b>						
dermatitis herpetiformis	1	0	1	3.67	0.15 to 90.08	.45
pemphigus vulgaris	0	5	5	0.11	0.01 to 1.99	.07
pemphigoid	0	1	1	0.41	0.02 to 9.97	.99
<b>Dermatitis and eczema:</b>						
seborrhoeic	27	13	40	2.63	1.29 to 5.62	.01
contact dermatitis	12	15	27	0.98	0.45 to 2.11	.99
pompholyx	0	3	3	0.17	0.01 to 3.36	.26
other eczemas	22	34	56	0.78	0.45 to 1.35	.41
<b>Pruritic:</b>						
pruritus	19	15	34	1.57	0.79 to 3.13	.22
pruritus nodularis	2	2	4	1.22	0.17 to 8.70	.99
lichen simplex chronicus	17	6	23	3.56	1.39 to 9.09	.006*
<b>Drug reactions:</b>						
drug reactions	1	13	14	0.09	0.01 to 0.70	.005*
fixed drug eruption	14	12	26	1.44	0.66 to 3.14	.43
papulosquamous: lichen nitidus	2	4	6	0.61	0.11 to 3.33	.70
lichen planus	15	26	41	0.69	0.36 to 1.33	.34
parapsoriasis	1	0	1	3.67	0.15 to 90.08	.45
pityriasis rosea	9	19	28	0.57	0.26 to 1.27	.18
psoriasis	7	10	17	0.85	0.32 to 2.26	.81
<b>Radiation:</b>						
actinic keratosis	1	0	1	3.67	0.15 to 90.08	.45
<b>Urticaria and Erythema:</b>						
urticaria	14	17	31	1.01	0.49 to 2.06	.99
angioedema	6	2	8	3.70	0.74 to 18.39	.15
papular urticaria	4	16	20	0.30	0.10 to 0.90	.02*
erythema multiforme	1	1	2	1.22	0.08 to 9.54	.99
<b>Skin appendages:</b>						
acne vulgaris	44	60	104	0.88	0.59 to 1.33	.60
alopecia	9	6	15	1.85	0.65 to 5.23	.30
pseudofolliculitis barbae	3	0	3	8.61	0.44 to 166.57	.09
sebaceous cyst	1	0	1	3.67	0.15 to 90.08	.45
acne keloidalis nuchae	16	1	17	20.22	2.68 to 152.76	.0001*
folliculitis keloidalis nuchae	1	0	1	3.67	0.15 to 90.08	.45
hyperhidrosis	3	1	4	3.68	0.38 to 35.44	.33
miliaria rubra	1	10	11	0.12	0.02 to 0.94	.02*
milia	0	1	1	0.41	0.02 to 9.97	.99
steacystoma multiplex	2	0	2	6.13	0.29 to 127.71	.20
dermoid cyst	0	1	1	0.41	0.02 to 9.97	.99
<b>Total</b>	<b>255</b>	<b>294</b>	<b>549</b>			

\*CI = 95% Confidence interval

**Table 2B. Non-infectious disorders of the skin and subcutaneous tissue according to gender using ICD-10**

<b>Non-infectious disorders: Other disorders of skin and subcutaneous</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Odds Ratio</b>	<b>95% CI*</b>	<b>P value</b>
<b>Connective tissues:</b>						
scleroderma	0	2	2	0.24	0.01 to 5.07	.50
mixed connective tissue disease	0	1	1	0.41	0.02 to 9.97	.99
discoid lupus erythematosus	3	5	8	0.73	0.17 to 3.07	.74
systemic lupus erythematosus	0	2	2	0.24	0.01 to 5.07	.50
vasculitis	2	0	2	6.13	0.29 to 127.71	.20
follicular hyperkeratosis	1	2	3	0.61	0.06 to 6.73	.99
ichthyosis vulgaris	4	1	5	4.92	0.55 to 44.09	.18
keratodermas	5	2	7	3.08	0.60 to 15.91	.25
leg ulcer	4	1	5	4.92	0.55 to 44.09	.18
<b>Pigmentary:</b>						
idiopathic hypomelanosis	2	3	5	0.81	0.14 to 4.88	.99
post inflammatory hypopigmentation	3	7	10	0.52	0.13 to 2.02	.53
vitiligo	14	11	25	1.57	0.71 to 3.49	.31
post inflammatory hyperpigmentation	3	4	7	0.92	0.20 to 4.11	.99
green discoloration of palm	0	1	1	0.41	0.02 to 9.97	.99
melasma	0	1	1	0.41	0.02 to 9.97	.99
exogenous ochronosis	1	1	2	1.22	0.08 to 9.54	.99
phrynoderma	0	2	2	0.24	0.01 to 5.07	.50
<b>Skin tumours:</b>						
dermatosis papulosa nigra	0	1	1	0.41	0.02 to 9.97	.99
dermatofibroma	0	4	4	0.13	0.01 to 2.50	.13
dermoid cyst	0	1	1	0.41	0.02 to 9.97	.99
keratoacanthoma	0	1	1	0.41	0.02, 9.97	.99
Kaposi sarcoma	1	0	1	3.67	0.15 to 0.08	.45
epidermal/melanocytic naevus	2	5	7	0.61	0.09 to 2.51	.47
malignant melanoma	0	2	2	0.24	0.01 to 5.07	.50
neurofibromatosis	2	2	4	1.22	0.17 to 8.70	.99
basal cell carcinoma	1	1	2	1.22	0.08 to 9.54	.99
squamous cell carcinoma	0	2	2	0.24	0.01 to 5.07	.50
seborrhoeic keratosis	1	10	11	0.12	0.02 to 0.94	.02
skin tags	2	2	4	1.22	0.17 to 8.70	.99
syringoma	3	5	8	0.73	0.17 to 3.07	.74
keloids	9	19	28	0.57	0.26 to 1.27	.18
hypertrophic scars	1	2	3	0.61	0.06 to 6.73	.99
xerosis cutis	5	6	11	1.02	0.31 to 3.35	.99
<b>Others</b>	8	12	20			
<b>Total</b>	<b>77</b>	<b>123</b>	<b>200</b>			

\*CI = 95% Confidence interval

Pruritus is the most prevalent skin symptom and has been reported more by females in several studies [32-34]. A Norwegian study, however, reported more itch among men though women reported more skin complaints than men [35]. We found almost equal gender predilection with a male to female ratio of 1.3:1.

Hansen's disease occurs in both tropical and temperate climates of the world. It remains an important public health problem, and a notifiable disease especially in Asia, Africa, and South

America [36]. The male:female ratio of infection is ~2:1 [37]. A higher predilection for the male gender occurred in this study.

Lymphatic filariasis is endemic in 83 countries with India, Indonesia, Nigeria and Bangladesh accounting for nearly 70% of cases, with a high rate of urban transmission recorded in Nigeria [38]. Prevalence has been found to be significantly lower in the female subjects than in the male [39]. A significant association with the male gender was seen in the present study.

Males were also reported to have a higher rate of infections by *Onchocerca volvulus* with onchodermatitis as the main presentation [40]. However, onchodermatitis was found to be more in females (though not significant). A similar result was obtained by Altraide et al. [11], while Afolabi et al. [41] reported a slight male preponderance.

Lichen simplex chronicus (neurodermatitis) refers to thickening of the skin with variable scaling that arises secondarily to repetitive scratching or rubbing. There is a sense of itch in a particular part of the skin and the affected person scratches. This repeats itself until a mechanical trauma is produced with lichenification and thickening. It is a common chronic skin disease, occurring in about 12% of the total population, and women are more affected than men in some studies [42,43]. A greater proportion was found in the male gender.

Folliculitis keloidalis nuchae (also known as Acne keloidalis nuchae) is a chronic inflammatory process involving the hair follicles usually at the nape of the neck with the resultant formation of keloidal papules and plaques [44]. Associations between haircut symptoms such as clean shaven haircut and bleeding and FKN has been documented [45]. It is common among black males with an incidence as high as 9.4% [46,47] and prevalence varying between 0.5-1.9% of skin diseases seen by dermatologists in Nigeria [12,14]. Prevalence found was 1.5% with a higher proportion in males.

Male to female ratio of 1:2 was obtained for herpes zoster, and there was no significant association with gender. Herpes zoster more commonly occurs in elderly patients than the general populace, and in immunocompromised than immunocompetent patients, and has a higher incidence in women than men [48]. Another study of incidence of herpes zoster documented a higher incidence in females [49].

Candidiasis is an opportunistic yeast infection usually caused by *Candida albicans*. Cutaneous candidiasis usually occurs in warm, moist and skin folds such as axillary and abdominal folds, inguinal or intergluteal areas. It can also involve the nails. *Candida intertrigo* and *paronychia* often affects females more than males [50]. A gender-based study of superficial fungal infections also showed that females more commonly have *candida intertrigo* [51]. Warm, humid climate with excessive sweating makes the infection to be very common in Nigeria [52].

Adverse drug reactions (ADRs) account for 3% to 6% of all hospital admissions and occur in 10% to 15% of hospitalized patients [53]. Drug eruptions accounted for 3.6% of all dermatoses in this study mostly affecting the female gender. Altraide et al. [11] also reported a prevalence of 5.8%, mostly involving females. Gender differences in drug activity have been reported in which women have a higher CYP 3A4 activity resulting in different pharmacodynamic responses in drug metabolism [54].

Papular urticaria was significantly associated with the female gender. In the Nigerian study by Altraide, females were also affected more than males [11]. However, a study done at a dermatology clinic in Pakistan revealed that adult males, children, non-locals (non-residents), and those from urban areas are more vulnerable to papular urticaria [55].

Miliaria is a disease of the eccrine sweat gland resulting in retention of sweat within the skin. Commonly affects children but can occur in any age group [56]. It usually occurs in hot and humid climates, and during the summer [57]. Gender predilection is not known in miliaria [58]. Miliaria rubra was significantly associated with female gender in this study. Disparities have been shown in the skin physiology of men and women. Men have been shown to have a higher stratum corneum hydration than women [8]. A study of differences in the sweating processes may explain the observed increase of miliaria in women.

Environmental factors may influence gender differences observed with skin diseases. For example, as greater numbers of males are involved with crime and therefore more imprisonments and overcrowding, a greater proportion of *tinea cruris* can result [59]. More females also present to dermatologists for dermatological care [11-13], and this may influence gender differences found in certain diseases. Predilection of certain diseases for specific areas in the body can influence the gender predilection. *Candida intertrigo* affects females more [60] due to more folds in inframammary and inguinal regions. A community study of incidence of skin diseases in each gender will be useful in further determining the differences.

## 6. LIMITATION OF STUDY

Study population: Not all patients with dermatological conditions presents to the



Dermatology clinics. Many are treated by the General physicians and Medical officers in private hospitals, state and local government hospitals.

The biophysical properties of the skin in both genders in relation to these diseases in this environment have not been reported, and will be studied sequel to this study.

## 7. CONCLUSION

Many dermatoses such as acne keloidalis nuchae, seborrhoeic eczema, seborrhoeic keratosis, and miliaria rubra were significantly associated with gender. Structural and physiological differences in the male and female skin may be responsible for gender predilection of skin diseases. These differences also vary in different regions and may be responsible for variable prevalence of skin diseases. There is need to study further in the population the association between gender differences in the skin and dermatoses.

## CONSENT

Patients consented to examination, diagnoses, further management, and agreed to have their pictures taken (provided their faces were not identifiable).

## ETHICAL APPROVAL

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 as part of an ongoing study on the prevalence and pattern of skin diseases in OAUTHC over ten (10) years – 2009 to 2019. The study was conducted in compliance with the principles of the Declaration of Helsinki.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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