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Dermatological disorders and dermatology-specific quality of life among secondary students in public and private schools in Kwara state, Nigeria

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Abstract: *Introduction:* Skin problems are very common and often affect people in very visible places leading to significant physical and psychological distress. Adolescents go through physiologic changes in their body during puberty with associated psychosocial changes. Having to live with skin disorders during these years can have life-long impact. This study aimed to describe the spectrum of skin disorders in adolescents attending secondary schools in Kwara state and evaluate the dermatology-specific quality of life of those affected by skin disorders.

Objective: To describe the spectrum of skin disorders among adolescents in secondary schools and evaluate the impact of skin disorders on the dermatology-specific quality of life of those affected.

Methods: This was a descriptive cross-sectional study. We examined 1000 students from 16 public and private secondary schools in Ilorin, Kwara state. Participant selection was done using a multi-staged stratified random sampling method. The impact on quality of life was evaluated with the

Children's Dermatology Life Quality Index (CDLQI) to determine their dermatology-specific Quality of life. Data obtained was analyzed with SPSS version 20 and was presented using tables and figures.

Results: The prevalence of skin disease in the study population was 68.4%. The most common skin disorders in order of decreasing frequency were: acne, pityriasis versicolor, dermatophytoses (Including tinea capitis, tinea corporis, tinea pedis, tinea unguium and tinea cruris), pityriasis capitis and traction alopecia. About three-quarters of those with skin disease reported an effect on their quality of life. The most frequent effect on QoL was attributed to the symptoms and feelings elicited by skin disease.

Discussion: This study found a high prevalence of skin disease in adolescents with most of them reporting an effect on their quality of life resulting from their skin problem however this was mostly a mild effect.

Keywords: Adolescents, skin disorders, Quality of Life (QoL)

Introduction

Dermatological disorders occur in all age groups however, some types of dermatoses have been known to be more prevalent in specific age groups.¹ Adolescents belong to the age group between 10 and 19 years according to the World Health Organization (WHO) and they constitute about a fifth of the total world population.² One remarkable change that occurs during adolescence is puberty and it is characterized by changes in the adolescent body including the skin. Besides pubertal skin changes in the adolescent, psychosocial changes are also prominent during this phase of development with a tendency to impact on the long-term mental health of these

adolescents.³ This was a community-based study that looked at the spectrum of skin disorders in an adolescent population and went further to determine the effect of these skin disorders on the Quality of life (QoL) of affected adolescents. This is important because skin problems often occur in areas that are reversible and as such may be associated with psychological reactions that may be harmful to the affected adolescent in the long term. Evaluating the effect of skin disorders on QoL will give a clearer and more accurate perspective of the disease burden of skin disorders and this may be used to advocate for more attention to this often-overlooked area.

Materials and methods

This was a descriptive cross-sectional study that was conducted in 16 secondary schools in Ilorin Kwara state, Nigeria. Research was approved by the University of Ilorin Teaching Hospital Ethical review board with ethical approval number ERC PAN 2017/03/1655. Additional approval was also obtained from the Kwara State ministry of Education. The research team consisted of 2 paediatric dermatologists, 2 paediatric residents in the dermatology unit and 4 research assistants. Sixteen schools out of the 145 secondary schools in the Ilorin metropolis were randomly selected through a multi-stage stratified random sampling method.

Eligibility criteria

Secondary school students aged between 10 and 19 years

Exclusion criteria

Students below 10 years and above 19 years.
Students who refused to give assent to the study.
Students who do not bring a signed informed consent form from their parents.
A total of 1300 students were initially recruited from the 16 secondary schools. Students were recruited over a 5-month period from November 2017 to March 2018. The research team paid a first visit to the selected schools during which the school management was informed about the study and their consent sought. A second visit was made to the selected schools a week before the research commenced and randomly selected students were addressed and given detailed information about the research. They were given assent forms to sign and consent forms to take home for their parents' signature. Only those who returned with assigned assent and consent form were eventually included in the study.
All study participants filled their socio-demographic details with the aid of the research assistants. Each student was then examined in well-lit private rooms by one of the doctors. All diagnosis made by the residents were cross checked by the consultant paediatric dermatologists.

Students with skin disease following examination were administered the Child's Dermatology Life Quality Index (CDLQI) or the dermatology quality of life index (DQLI) (Appendix 1). The CDLQI is a questionnaire used to assess dermatology-specific life quality index of children aged 4 to 16 years. The adult version is the dermatology quality of life index (DQLI) and was used for adolescents older than 16 years. Both questionnaires were developed by researchers at Cardiff University and has been validated in Nigeria.^{4,5} The QoL questionnaire is often analyzed in 2 different ways; scores from each of the 10 questions can be added together to give a minimum score of 0 and a maximum score of 30. This is then further analyzed as detailed below. The questionnaire can also be analyzed along its sub-domains of symp-

oms/feelings, leisure, school/holidays, personal relationships, sleep and effect of treatment. Specific questions address each sub-domain.

Those with scores from 0-1 were assigned no effect on their QoL, while scores from 2 onwards indicated an effect on the QoL which was further classified into mild effect (2-6), moderate effect (7-12), large effect (13-18) and extremely large effect (19-30). Data was entered and analyzed with the Statistical package for Social Sciences (version 20).

All those with readily treatable skin conditions were prescribed medications while some were referred to the paediatric dermatology clinic of the University of Ilorin Teaching Hospital for further tests. Students with moderate to severe impairment in quality of life were also referred to see a paediatric psychiatrist

Results

A total of 1300 students were initially recruited for this study however only 1000 students eventually participated giving 76.9% response rate.

Participants were recruited from the junior and secondary classes of private and public secondary schools within Ilorin metropolis. The number of males was 442 (44.2%) while female participants were 558 (55.8%). The male: female ratio was 1:1.3. Early adolescents aged between 10 – 13 years constituted the largest group (46.8%) of the study population; while late adolescents, age 17 – 19 years were the least, (12.3%) of the total study population. The mean age of the study population was 13.8 ± 2.2 years. The mean age for the boys was 14.0 ± 2.2 years and mean age for the girls was 13.6 ± 2.1 years. See Table 1

The prevalence of dermatologic disorders in this study was 68.4%. According to Table 2a & 2b below, a total of 44 specific dermatoses were identified among the subjects and they belonged to eight broad categories of skin diseases. Disorders of the skin appendages were the most prevalent category, 357 (42.3%) while papulosquamous disorders were the least prevalent, 9 (1.1%). Amongst the specific diagnoses, acne vulgaris 266 (31.6%) was the most frequent skin disorder, followed by pityriasis versicolor 159 (18.9%). Others were dermatophytoses 111 (13.2%), seborrhoeic dermatitis 60 (7.1%) and traction alopecia 51 (6.0%). These top 5 diagnoses accounted for 76.8% of the total diagnoses made.

Table 1: Socio-demographic characteristics of the study

Population		
Socio-demographic indices	Frequency (1000)	%
<i>Gender</i>		
Male	442	44.2
Female	558	55.8
<i>Type of school</i>		
Public	526	52.6
Private	474	47.4
<i>Age group</i>		
10-13 years (early adolescents)	468	46.8
14-16 years (mid adolescents)	409	40.9
17-19 years(late adolescents)	123	12.3
<i>School class</i>		
Junior	475	47.5
Senior	525	52.5
<i>Social class[#]</i>		
Lower	231	23.1
Middle	294	29.4
Upper	475	47.5
<i>Ethnic group</i>		
Yoruba	805	80.5
Hausa	49	4.9
Igbo	29	2.9
Others	117	11.7

(#- social class I&II: upper, social class III: middle and social class IV&V: lower)

Table 2a: Spectrum of dermatological disorders among the adolescents

Categories of dermatological disorders	Specific dermatological disorders	No	% of Total*
Skin appendages		357	42.3
	Acne vulgaris	266	31.6
	Traction alopecia	51	6.0
	Traction folliculitis	13	1.5
	Hyperhidrosis	7	0.8
	Milaria	6	0.7
	Scarring alopecia	3	0.4
	Ingrowing toenail	3	0.4
	Acne keloidalis nuchae	2	0.2
	Hirsutism	2	0.2
	Canitis	1	0.1
	Alopecia areata	1	0.1
	Dystrophic nails	1	0.1
	Beau lines	1	0.1
Infections/ infestations		288	34.2
	Pityriasis versicolor	159	18.9
	Dermatophytoses	111	13.2
	Pyoderma	10	1.2
	Pyogenic granuloma	4	0.5
	Viral warts	2	0.2
	Scabies	1	0.1
	Paronychia	1	0.1
Dermatitis		68	8.1
	Seborrheic dermatitis	60	7.1
	Atopic dermatitis	4	0.5
	Irritant dermatitis	2	0.2
	Nickel dermatitis	1	0.1
Lichen simplex chronicus		1	0.1
	<i>Pigmentary disorders</i>		
		38	4.5
	Post-inflammatory hyper-pigmentation	20	2.4
	Exogenous ochronosis	16	1.9
Albinism		1	0.1
	Piebaldism	1	0.1
	<i>Urticaria and erythema</i>		
		25	3.0
PapularurticariaChronic urticaria		24	2.8
		1	0.1

Table 2b: Spectrum of dermatological disorders among the adolescents (contd)

Categories of dermatologic disorders	Specific dermatological disorders	No	% of Total
Atrophic/hypertrophic disorders		23	2.7
	Hypertrophic scars	10	1.2
	Striae distensae	10	1.2
Papulosquamous	Keloid	3	0.4
		9	1.1
	Lichen nitidus	4	0.5
	Pityriasis rosea	3	0.4
Others	Lichen planus	1	0.1
	Lichen striatus	1	0.1
		35	4.2
	Naevus	23	2.7
	Dermatosis papulosa nigra	4	0.5
	Plantar keratoderma	3	0.4
	Xerosis	2	0.2
Acanthosis nigricans	2	0.2	
Granuloma annulare	1	0.1	

*Some subjects had more than one diagnosis

Distribution of dermatology-specific quality of life scores.

Total dermatology-specific QoL scores of subjects with dermatoses in this study, ranged between 0 and 24. Severity bands of total dermatology-specific QoL scores Overall, 496 (72.5%) of all those with skin disorders had impairment in their dermatology-specific QoL. Three hundred and fifty two(51.5%) had a mild impairment in their dermatology-specific QoL, while 4 (0.6%) of those with skin disorders had an extremely large effect on their dermatology specific QoL. See Table 3. The median total QoL score of the top skin disorders ranged between 3 and 4,

Table 3: Severity bands of total dermatology-specific QoL scores

Severity banding*	Score	n	%
No effect	0 - 1	188	27.5
Mild effect	2 - 6	352	51.5
Moderate effect	7 - 12	105	15.4
Large effect	13 -18	35	5.1
Extremely large effect	19 - 30	4	0.5
Total		684	100

Comparison of median dermatology-specific QoL scores with socio-demographic indices.

Students from public schools had a lower median total dermatology-specific QoL score of 3.0 (1.0-5.0) compared to those in the private schools 4.0 (1.0-6.8), and this was statistically significant (U= 50383.500, p=0.006). The scores were however comparable across gender, school class, age group and social class, (p>0.05) as shown in Table 4

The two sub-domains that adolescents ≤ 16 years had

the most impairment in were the symptom/feelings and the treatment domains (76.1% and 52.9% respectively). School activity and sleep were the least affected domains (9% and 11.8% respectively). This is illustrated in Figure 1

Table 4: Top 5 skin disorders and their total median QoL score

Skin disease	Frequency	Median QoL score (IQR)
Acne vulgaris	266	3.0 (1-6)
Pityriasis versicolor	159	3.0 (1-5)
Tinea capitis	68	4.0 (2-6)
Seborrheic dermatitis	60	3.0 (1-6)
Traction alopecia	51	3.0(2-7)

Table 5: Comparison of median dermatology-specific QoL scores with socio - demographic indices

Variables	n (%)	Median total QoL score (IQR)	U ^b	p value
<i>Gender</i>				
Male	278 (40.6)	4.0 (2.0-6.3)	51637.000	0.057
Female	406 (59.4)	3.0 (1.0-6.0)		
<i>Type of school</i>				
Public	388 (56.7)	3.0 (1.0-5.0)	50383.500	0.006 *
Private	296 (43.3)	4.0 (2.0-6.8)		
<i>Class</i>				
Junior	296 (43.3)	3.0 (1.0-6.0)	56352.000	0.674
Senior	388 (56.7)	3.0 (1.0-6.0)		
<i>Age group</i>				
Early (10-13)	290 (42.4)	3.0 (1.0-6.0)	1.062 ^c	0.588
Mid (14-16)	296 (43.3)	3.0 (1.0-6.0)		
Late (17-19)	98 (14.3)	3.0 (1.0-5.3)		
<i>Social class</i>				
Lower	169 (24.7)	3.0 (1.0- 6.0)	2.540 ^c	0.281
Middle	204 (29.8)	3.0 (1.0 – 6.0)		
Upper	311(45.5)	3.0 (1.0 -6.0)		

*- significant, ^b-Mann-whitney U, ^c - Kruskal-wallis

Fig 1: Frequency of impairment of the CDLQI domains in subjects ≤ 16 years

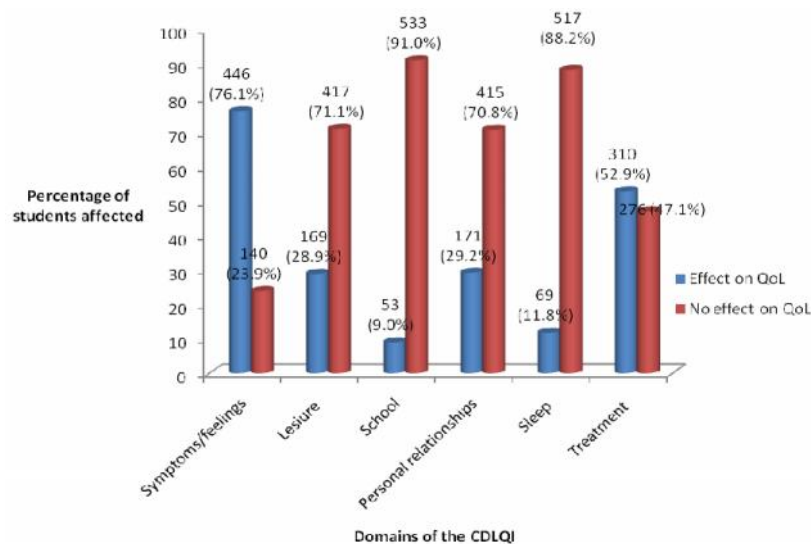
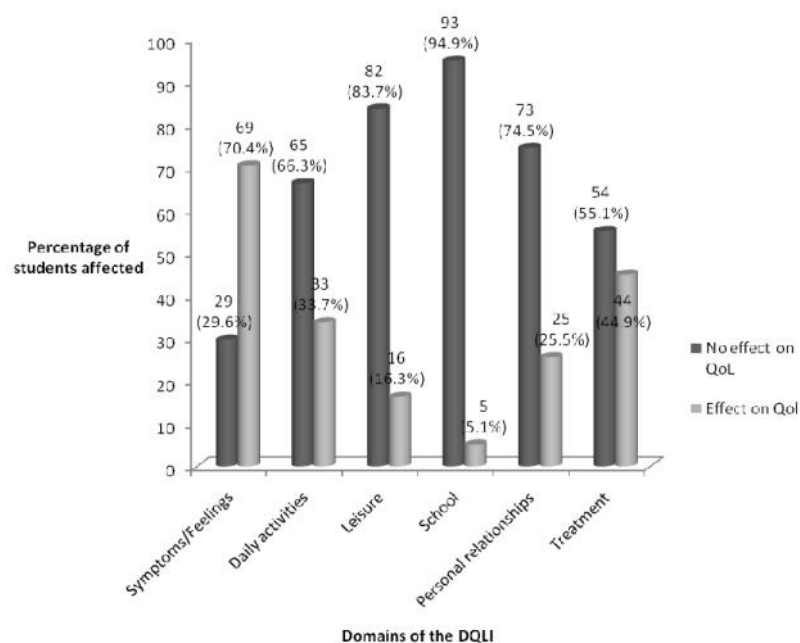


Fig 2 depicts that the symptoms/feelings, 69 (70.4%) domain was also most affected by subjects ≥ 17 years, followed by impairment caused by the treatment of the skin disorders 44 (44.9%). School and leisure were the least affected domains.

Fig 2: Frequency of impairment of the DQLI sub-domains in subjects ≥ 17 years



Discussion

Skin disorders are common and vary widely in adolescents.^{6,7} The prevalence of skin disorders in our study was high. Several dermatology-epidemiology studies have found a similar prevalence in community-based studies.^{8,9} Acne vulgaris was the most frequently diagnosed skin disease followed by pityriasis versicolor. Two other studies in Nigeria have found a similar pattern in adolescents.^{10,11} This buttresses the role of pubertal changes in the pilosebaceous units as these two disorders have their pathogenesis linked to structure and function of the pilosebaceous units.¹²

This study found a wide range of dermatological conditions among the adolescents, however the top 5 skin disorders accounted for 76.8% of all the diagnoses made. This is similar to what Henshaw *et al*¹⁰ found in Calabar where the top 5 skin conditions in the teenage population accounted for 80% of all the diagnosis made. The implication of this finding is that a lot can be done for adolescents with skin disorders by focusing on the most common types.

About three-quarters of patients affected by skin disorders in our study reported an impairment in their quality of life. This is a remarkable finding given that there is a tendency to trivialize skin disorders because they are not usually associated with mortality, it is important to routinely consider the effect of diseases on QoL as part of the measure of the morbidity of any illness.¹³

We also found that students affected by the most frequent dermatoses had a relatively low QoL score which indicates a mild effect. This largely mild effect reported is probably because these skin disorders identified are common in the studied adolescents and having a friend or school mate with a similar condition may make it easier to cope with having something similar. Olsen *et al*¹⁴ in a meta-analysis of studies where the CDQLI was used also found that impairment was mostly in the mild range in children. Hospital-based studies of skin disorders and QoL however sometimes find higher scores probably because health-seeking behaviour for skin disorders is generally poor in our communities and before orthodox care is sought for a skin problem it is likely to have become physically and mentally debilitating.¹⁵

There was a significant difference between the QoL scores of students attending private schools and those in public schools. This is probably because attending a private school in Nigeria is often times associated with increased affluence, exposure and awareness, hence they might be better able to relate with and respond to the questions of the QoL tool. Also, it is possible that since

most subjects in private schools were from the upper social class, basic amenities are not an immediate problem for them and as such they are inclined to invest more attention in their appearance with regards to their skin.

Following analysis of the different domains of the CDLQI and the DLQI, the symptom/feeling domain was most frequently impaired than other domains, followed by the treatment domain. The symptoms of dermatological disorders are not limited to physical concerns such as pain or itch but could also be disfigurement especially when they are located in obvious places such as the face. This is seen in some of the prominent skin disease diagnosed during this study e.g acne vulgaris and pityriasis versicolor. This can be very distressing for adolescents and may explain why the symptom/feeling domain was most frequently affected.

The treatment domain was the 2nd most affected domain after the symptom/feeling domain. A reason for this could be that, in a country such as ours, where drug sales and purchase is poorly regulated, many of these adolescents are likely to spend a sizeable part of their allowance purchasing varying skin remedies for the skin problems they have. This could explain why they reported a slightly higher impairment due to treatment of their skin problems. In a hospital-based study in Brazil, where atopic dermatitis, psoriasis and vitiligo were studied, researchers found that the most impaired domains were the symptom/feeling and leisure domains.¹⁶ The age group of the Brazilian study was children between 5 and 16 years, this could account for why leisure was more prominently impaired as play is still an important part of the daily activities of younger children compared to this study that considered older children.

A particularly unique feature of this study was that a generic dermatology-specific QoL tool was used to examine the effect of several skin conditions on QoL. This provided an insight into how both common and rare skin diseases may affect QoL, it however has the drawback of limiting comparisons between uneven populations. This is because the QoL scores of a small population affected by a particular skin disease may not be a true reflection of what a larger population affected by the same disease will show.

Overall, this study has established that adolescents have a high prevalence of skin disorders and also suffer impairment in their QoL on account of these skin disorders albeit a largely mild effect.

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