

Severity and impact of acne vulgaris on the quality of life of adolescents in Nigeria

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Background: Acne vulgaris is a common skin condition, which affects most adolescents at some point in their lives. It has been found to have a significant impact on their psychological well-being and has been associated with depression and suicide ideation. Many studies have assessed the impact of acne vulgaris on the quality of life (QoL) in different population subgroups around the world, but there is a dearth of reports from the African subcontinent. This study thus seeks to assess the severity of acne vulgaris and determine its effect on the QoL of adolescents in Lagos, Nigeria.

Methods: In a cross-sectional survey employing a two-stage sampling method, the severity of acne vulgaris and its impact on the QoL of adolescents attending a senior secondary school in Lagos, Nigeria was assessed using the Global Acne Grading Scale (GAGS) and the Cardiff Acne Disability Index (CADI), respectively. The correlation between the results of the GAGS and CADI was also determined.

Results: One hundred and sixty adolescent students with acne were recruited, with males accounting for 51.9% and females 48.1%. The mean and standard deviation of the GAGS severity scores were 11.3±5.4 for males and 11.9±5.4 for females. Only one student had severe acne vulgaris (GAGS, 31–38), 10% moderate (GAGS, 19–30), and 89.4% mild (GAGS, 1–18). The overall CADI score was 3.4±3.0, which suggests mild impairment in QoL; however, the solitary student with severe acne had severe QoL impairment. There was a weak positive correlation between the GAGS and the CADI score.

Conclusion: Most adolescents in our study had mild acne vulgaris, and the overall impact on their QoL was mild. However, the correlation between the psychosocial impact and acne severity was weak. There is a need for similar studies in other parts of the country and for further studies to determine the adequacy of the existing instruments in assessing the impact of acne vulgaris in Nigerian adolescents.

Keywords: CADI, GAGS, skin disease, teenage dermatosis, psychosocial impact

Introduction

The human skin is the body's main interface with the external world; the skin is the site of events and processes crucial to the way we think about, feel about, and interact with one another.^{1–3} It can thus be regarded as the body's major public relations tool. Conditions which affect the skin may, therefore, affect an individual's ability to function properly in society,⁴ more on account of the negative psychological impact than from the presence of disease. Acne vulgaris is one such condition, primarily seen in adolescents and often with a definite and limited course. Its onset coincides with the period of the development of the secondary sexual characteristics and may add to the emotional and psychological challenges experienced during this period.⁵

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The World Health Organization (WHO) defines quality of life (QoL) as the individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. It is a broad-ranging concept, affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment.⁶

The measurement of QoL has been recognized as being of crucial importance in the assessment and management of diseases.⁷ A number of instruments have been designed to determine the impact of diseases on the QoL of individuals; some are generic and others specific to particular disease entities.

Acne vulgaris is very common in adolescents in Nigeria, with a prevalence ranging from 35%–90.7%^{8–10} in community-based surveys across the nation; it has also consistently ranked among the ten most common reasons for consultations in dermatologic outpatient clinics in both the northern and southern parts of the country.^{11–13} It has been found to have a significant negative impact on the health-related QoL of adolescents;¹⁴ however, little is known of its effect on the QoL of Nigerian adolescents. Employing an instrument which has not been validated, Yahya¹⁰ found that the condition had little or no impact on the daily lives of adolescents in Kaduna, Northern Nigeria. We have thus employed a slightly modified English version of the Cardiff Acne Disability Index (CADI) – a well validated acne instrument derived from a much longer one by Motley and Finlay¹⁵ – to assess the impact of acne vulgaris on in-school adolescents in Lagos State.

Lagos State is located in the southwestern part of Nigeria. It is the smallest, yet most populous multiethnic city in the country.¹⁶ This is due to its having been the capital of Nigeria from 1914–1991, after which the capital was moved to Abuja. It, however, still remains the economic center of the country.¹⁷

Methods

This was a cross-sectional survey conducted over a 3-week period, between January and February 2009, among all eligible senior secondary school adolescents in Mushin, a densely populated suburb of Lagos State. It involved a two-stage, random sampling method, in which the study area (Mushin) was randomly selected out of the 20 local government areas in Lagos State.¹⁸ Thereafter, one school was randomly selected from the 17 eligible schools (eligibility criteria: senior

secondary, coeducational, day school). The sample size for the study was calculated, and a minimum sample size of 141 was obtained (including a 10% attrition rate); this was increased to 160.

Seven hundred and twenty eight students completed a semistructured questionnaire, providing information such as biodata, history, and characterization of acne, health-seeking behavior, therapies employed in the treatment of acne, and sources of therapeutic agents. The students were then examined for the presence of acne. Among those with acne, 160 consecutive students had their acne severity graded using the Global Acne Grading Scale (GAGS). This grading scale calculates the severity of acne through the combined assessment of the types of acne lesions (comedones, papules, pustules, and nodules) and their anatomic location (forehead, cheeks, nose, chin, chest, and back). The GAGS score ranges from 0 (no acne), 1–18 (mild acne), 19–30 (moderate acne), 31–38 (severe acne), and ≥ 39 (very severe acne). Students also completed a second interviewer-administered questionnaire: the CADI, which contains five questions, each with Likert-type options assessing emotional, social, and psychological consequences, in addition to subjectively assessing the severity of their acne. The maximum score for each question is 3, while the minimum is 0. The total score for all five questions range from 0–15, and for the purpose of this study, they were categorized into 0 (no impairment from acne), 1–5 (mild impairment from acne), 6–10 (moderate impairment from acne), and 11–15 (severe impairment from acne). The data generated were analyzed using the Statistical Package for the Social Sciences software, version 17 (SPSS Inc., Chicago, IL, USA).

Simple tables were used to show the variables obtained. The chi-square test and Fisher's exact test (the latter for *n* values less than 5) were used to analyze statistically significant difference of variables, and the Spearman correlation coefficient test was used for correlation between the variables; *P*-value less than 0.05 was accepted as being statistically significant.

Ethical clearance was obtained from the research and ethics committee of the Lagos University Teaching Hospital, and permission was also obtained from the Mushin Local Government Area and school authorities.

Results

A total of 160 students with acne vulgaris were assessed, comprising 83 males and 77 females, with a mean age of 16.1 ± 1.5 years (mean \pm standard deviation [SD]). Analysis of the questionnaires filled out by all 728 students prior to

physical examination revealed that 42% of the 160 subjects with acne had earlier denied having acne. The overall GAGS score (mean \pm SD) was 11.3 \pm 5.4 for males and 11.9 \pm 5.4 for females. The majority of students (89.4%) had mild acne while 10.0% had moderate acne, with more females being affected in this grade. There was only one case of severe acne, and this was in a male student. The difference between the sexes in terms of severity of acne was statistically significant, with females having a higher grade of acne severity compared to males ($X^2=5.97$, $P=0.03$) (Table 1). Males were more likely to have treated acne (72.2%) compared to their female counterparts (59.8%); however, more females (28.6%) were found to have treated with topical steroids than males (23.4%).

There were varying degrees of acne-induced QoL impairment, and 15% of respondents had no impairment in QoL, even though they had different grades of acne severity. The CADI score showed that 85% of respondents were, to varying degrees, negatively affected by the presence of acne; 61.2% had mild, 21.5% had moderate, and 2.5% had severe impairment in QoL. The mean overall CADI score was 3.4 \pm 3.0, with a mean score of 3.8 \pm 3.2 in males and 3.1 \pm 2.7 in females. This was not statistically significant ($X^2=2.14$, $P=0.73$). Table 2 shows the degree of disability by sex, using the CADI score.

Analysis of the individual CADI questions showed that 43.9% of the respondents expressed negative emotions as a result of having acne; 21.9% had some impairment in social interactions, 14.4% would not publicly expose extrafacial areas affected by acne, 64.4% were in some way psychologically affected by acne, and 71.9% thought their acne was a problem. Details are shown in Table 3.

The association between GAGS and CADI score is shown in Table 4. There was a statistically significant, weak positive correlation between acne severity and CADI ($r=0.24$, $P=0.003$) (Figure 1).

Discussion

Acne vulgaris is a common skin disease among adolescents, thus it is curious that 42% of our subjects had initially denied

Table 1 Comparison of acne severity by sex

Acne severity (GAGS score)	Sex n (%)			
	Male (83)	Female (77)	Total (160)	
Mild (1–18)	78 (94.0)	65 (84.4)	143 (89.4)	$\chi^2=5.97$;
Moderate (19–30)	4 (4.8)	12 (15.6)	16 (10.0)	$df=2$;
Severe (31–38)	1 (1.2)	0 (0)	1 (0.6)	$P<0.05$;
Total	83 (100)	77 (100)	160 (100)	0.03*

Note: *Fisher's exact test.

Abbreviations: GAGS, Global Acne Grading Scale; *df*, degrees of freedom.

Table 2 Showing degree of disability by sex using CADI score

CADI score	Sex n (%)			
	Male (83)	Female (77)	Total (160)	
None	13 (15.7)	11 (14.3)	24 (15.0)	$\chi^2=2.14$; $df=4$;
Mild	48 (57.8)	50 (65)	98 (61.2)	
Moderate	19 (22.9)	15 (19.5)	34 (21.3)	
Severe	3 (3.6)	1 (1.3)	4 (2.5)	
Total	83 (100)	77 (100)	160 (100)	

Note: *Fisher's exact test.

Abbreviations: CADI, Cardiff Acne Disability Index; *df*, degrees of freedom.

having acne. This is similar to the result from a survey in Northern Nigeria, where up to 40% of students with acne in a secondary school reported the contrary.¹⁰ This may stem from a true unawareness, denial, or a reluctance to be branded as having the same disease as persons with more severe forms of acne. In a Brazilian study among male adolescents with acne, Almeida et al¹⁹ reported that the prevalence of active acne obtained by dermatological examination was higher than that for self-reported acne, concluding that self-reporting of acne in adolescents is an inadequate instrument for epidemiological studies.

The vast majority of students had mild acne, and a little over 10% had moderate/severe acne. A similar pattern was obtained in comparative studies by Yahya¹⁰ in Kaduna, and Hanisah et al²⁰ in Malaysia. They recorded 93.1% and 90.2% frequency of mild acne, respectively. However, Tan et al²¹ obtained a near equal prevalence of moderate/severe acne (48.6%) and mild acne (51.4%) in Singaporean adolescents. In hospital-based studies, Agheai et al²² found more moderate/severe grades of acne (84%)

Table 3 Frequency table showing responses to specific CADI questions

Modified CADI questions (n=160)	Responses (n%)	
	Yes	No
Question 1: Have you felt aggressive, frustrated, or embarrassed on account of your acne?	70 (43.7)	90 (56.3)
Question 2: Do you think acne has interfered with your social life and relationship with the opposite sex?	35 (21.9)	125 (78.1)
Question 3: Have you avoided wearing swimming costumes or clothes which may expose areas of your trunk with acne?	23 (14.4)	137 (85.6)
Question 4: Have you been concerned about the appearance of your acne?	103 (64.4)	57 (35.6)
Question 5: Does your acne pose a problem to you now?	115 (71.9)	45 (28.1)

Note: Time frame of Questions 1 – 4 is during the last month.

Abbreviation: CADI, Cardiff Acne Disability Index.

Table 4 Association between CADI score and GAGS

Degree of impairment of quality of life (CADI score)	Acne severity n (%) (GAGS score)			
	Mild acne (1–18)	Moderate acne (19–30)	Severe acne (31–38)	Total (%)
None (0)	23 (16.1)	1 (6.25)	–	24 (15.0)
Mild (1–5)	90 (62.9)	8 (50.0)	–	98 (61.3)
Moderate (6–10)	28 (19.6)	6 (37.5)	–	34 (21.3)
Severe (11–15)	2 (1.4)	1 (6.25)	1 (100)	4 (2.5)
Total	143 (100)	16 (100)	1 (100)	160 (100)

Abbreviations: CADI, Cardiff Acne Disability Index; GAGS, Global Acne Grading Scale.

compared to mild grades (16%), and so did Mallon et al²³ in the UK. This is not unexpected, as persons with more severe diseases are likely to seek medical intervention, thus hospital-based studies are likely to yield more severe forms of acne compared to community-based ones such as ours.

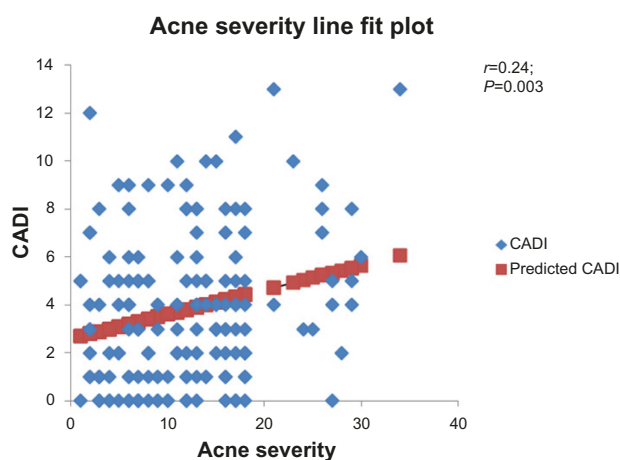
In our study, females were surprisingly found to have more severe forms of acne than males although the solitary student with severe acne was male. This is contrary to the widely held view that acne is more severe in males, as shown in the surveys by Hanisah et al²⁰ and by Aktan et al²⁴ in Turkish high school students. A probable reason for our findings may be the more frequent use of steroid-containing creams for the treatment of acne, a practice which was more common among females. The use of topical steroid for skin bleaching is common in our environment, more so in females than in males. This has been associated with the development of steroid acne.²⁵

The overall CADI score was 3.4 ± 3.0 , indicating a mild degree of disability from acne. Similar values were obtained

in some community-based studies^{20,26} while higher scores of 6.5 and 6 were obtained by Motley and Finlay¹⁵ in the UK and Oakley²⁷ in New Zealand, respectively. Several reasons may be adduced for the relatively higher CADI scores in the two latter studies, which were hospital-based: Firstly, hospital-based studies have a higher concentration of persons with more severe grades of acne compared to community-based surveys. Secondly, the ages of patients in hospital-based surveys are varied compared to the exclusively adolescent age of the aforementioned community-based studies. Another factor may be cultural and/or racial; the studies with higher CADI scores were conducted in Western societies.^{15,27} The marked emphasis placed on body image in these societies (mostly fueled by external cues such as the media) and the observed greater satisfaction and more positive perception of body image among black women compared to whites²⁸ may also account for the disparities in the CADI scores. This line of reasoning is, however, controverted by the very low CADI score (1.9) obtained by Walker and Lewis-Jones²⁹ in a community-based survey of Scottish school children.

Certain questions in the CADI questionnaire were observed to have more impact on our subjects than others. Fewer persons (14.4%) were affected by question 3, which alluded to the presence of acne on extrafacial areas. This was also the observation in Malaysia.²⁰ This may either imply that extrafacial acne is uncommon, thus persons without such lesions are in no way affected; or that the presence of such lesions has no effect on the respondents' utilization of public changing facilities or mode of dressing; or even that the question is not relevant to the vast majority of respondents who probably have no need to use public changing facilities as they neither take part in outdoor sports or swimming. The highest percentage of respondents with QoL impairment were found in questions 4 and 5, which revealed that 64.4% (question 4) were psychologically perturbed by the appearance of their skin, and 71.9% (question 5) thought their acne was a problem. These questions also elicited the highest percentage of responses from studies by Hanisah et al²⁰ and Perić et al,²⁶ implying that these questions allowed for a greater degree of problem articulation than others.

The correlation between GAGS and the CADI score was weak. This is similar to the findings by Law et al,³⁰ who recorded that the clinical severity of acne did not correlate strongly with the effect on QoL. This may imply that impairment in the QoL of adolescents is not solely determined by acne severity (reason why some adolescents with mild acne present with marked QoL impairment and others with moderate/severe acne record little or no impact on their QoL)

**Figure 1** Correlation between GAGS and CADI.

Abbreviations: CADI, Cardiff Acne Disability Index; GAGS, Global Acne Grading Scale.

or that the CADI instrument (generated in a Western society) may not be adequately structured to measure the psychosocial impact of acne severity in our Nigerian adolescents. This is against the backdrop that man is a product of his environment; thus, the culture and value systems of a given society affect the perception and concerns of members of that society as inferred in the WHO definition of QoL.⁶ There is, thus, a need for more local studies to ascertain the validity of the CADI instrument in assessing the psychosocial impact of acne on Nigerian adolescents.

The major limitation of this study is that it was conducted among adolescents in a public school in Lagos and may not reflect the findings in more affluent adolescents, most of whom attend private schools. Also, since causality cannot be inferred in cross-sectional surveys, it is difficult to implicate acne as the sole cause of the QoL impairment. In addition, some factors which can influence the impact of acne in adolescents in our environment, such as the socioeconomic status and ethnicities of the respondents and their relationship to QoL, were not assessed. However, the examination of the students to ascertain the actual presence or absence of acne precluded our reliance on self-reported acne, which has been found to be an inadequate instrument in epidemiologic surveys.

Conclusion

Acne vulgaris affects the QoL of many adolescents to varying degrees. Although the impact of acne on the QoL of adolescents in Lagos is mild, the use of QoL measures is important to identify persons psychologically affected by the disease. There is a need for more studies to validate the existing QoL instruments in the Nigerian population; this may be a preface to the modification of existing instruments or the generation of new ones structured to suit the values and culture of our society.

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Author contributions

EEO was involved in the conception and design of the manuscript, data acquisition, analysis and interpretation and drafting of the manuscript. EBH was involved in data analysis and interpretation, drafting and critical revision of the manuscript for important intellectual content. Both

authors read and approved the final version to be published; and agree to be accountable for the accuracy and integrity of all aspects of the work.

Disclosure

The authors report no conflicts of interests in this work.

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