

Prevalence of acne and its impact on the quality of life in school-aged adolescents in Malaysia

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ABSTRACT

AIM: The objective of this study was to determine the prevalence of facial acne and its impact on the quality of life among adolescents attending secondary schools in Muar, Malaysia.

METHODS: A cross-sectional study was conducted where 409 samples were selected using stratified cluster random sampling from two secondary schools in Muar, involving Form 1 to Form 5 students. Students were diagnosed clinically and the severity of facial acne was assessed using Global Acne Grading System. A self-reported Cardiff Acne Disability Index was used to assess the quality of life among adolescents who had acne.

RESULTS: The prevalence of facial acne among the adolescents was 67.5% (n=276). Facial acne increased with increasing age (p=0.001). It was more common among males (71.1%) than females (64.6%), p=0.165. The males also had a higher prevalence of severe acne (p=0.001). The quality of life was affected by the severity of acne. Students with severe acne had higher levels of Cardiff Acne Disability Index (rho=0.521).

CONCLUSION: Facial acne is a common disorder and appears to have a considerable impact on quality of life among adolescents. The above findings should alert health care professionals and the school authorities to actively identify, manage and educate adolescents with facial acne.

KEYWORDS: Facial acne, adolescents, Cardiff Acne Disability Index, quality of life

Introduction

Acne vulgaris is the most common dermatological condition encountered in adolescents. It affects almost 85% of people 12–24 years of age.¹ It commonly affects young people during the time when they are undergoing maximum psychological, social and physical changes.

Acne commonly involves the face. Facial appearance represents important aspects of one's perception of body image. Therefore, it is not surprising that a susceptible individual with facial acne may develop significant psychosocial disability. Emotional stress can also exacerbate acne, and patients with acne may develop psychiatric problems as a consequence of their problem.²

Skin disease can have a major impact on one's quality of life. Overall quality of life is an all inclusive concept incorporating all factors that impact upon an individual life. The concept can be divided into several components, including psychological, social and physical domains.³ The impact of acne on a particular patient is not always easy to judge clinically. It was found that both women and men find the effects of acne on appearance to be the most bothersome aspect of their disease and the negative effects of acne occur in both older and younger patients.⁴ Even mild acne can pose a significant problem for some patients, diminishing their quality of life and in some cases their social functioning.^{5,6}

Acne may also be associated with decreased self-esteem/self-confidence, interpersonal difficulties,

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unemployment and increased prevalence of anxiety and depression.^{7,8} A study of 111 acne patients aged 16 years and over attending a United Kingdom dermatology outpatient clinic found levels of social and emotional problems are comparable with those in people with severe chronic disabling disease such as arthritis and epilepsy.⁹

However, the relationship between the severity of acne and emotional distress is poorly understood although it is known that acne is a source of distress and embarrassment.¹⁰ Therefore there is a need to study the psychosocial impact and the quality of life of young people with acne using validated and age appropriate measures and an objective assessment of acne status. Thus the aim of this study is to determine the prevalence of acne and its impact on the quality of life in adolescents.

Materials and methods

This was a cross-sectional study conducted in two secondary schools in Muar, Malaysia. Muar is a district in one of the states in Malaysia. It has a multiethnic population. There are about 17 secondary schools in the district. The two secondary schools were selected randomly. These schools are co-educational schools which comprise Form 1 to Form 5 students.

The calculation of sample size was performed using Epi info Statistical Package, using the formula $n = [z / \sigma]^2 \times p [1-p]$, where n is a sample size, z is the confidence interval taken as 1.96, σ is taken as 0.05 and p is the probability in this study and taken as prevalence of acne vulgaris in Malaysia which is about 85%.¹¹ Considering the drop off rate as 10%, the minimum sample size calculated was 196. The sample size was then doubled to 400 due to stratified cluster sampling method.

With the approval of the headmasters of the two secondary schools, the lists of students were obtained from the school registration books. The study population was stratified into five strata based on their forms; Form 1 to Form 5. In each stratum, the samples were selected randomly. The informed consent letter describing the research was given to the selected students and their par-

WHAT GAP THIS FILLS

What we already know: Acne vulgaris is the most common dermatological condition encountered in adolescents, affecting them at a time when they are undergoing maximum psychological, social and physical changes. Acne can pose a significant problem for some patients, diminishing their social functioning and may be associated with decreased self-esteem/self-confidence, interpersonal difficulties, unemployment and increased prevalence of anxiety and depression.

What this study adds: Facial acne is a common disorder and appears to have a considerable impact on quality of life among adolescents attending secondary schools, particularly in severe cases. Primary health care professionals and school authorities should actively identify, manage and educate adolescents on facial acne.

ents. The students were excluded from the study if they or their parents refused to give consent. Absentees during the data collection day were also excluded from the study.

On the data collection day, schools were visited by the researcher and school health nurse. Each student was examined for acne. In this study, the examination for acne included the head and neck only. All the manifestations of acne from comedones to nodules, not only by its presence but also number was reported. The acne severity was then graded using Global Acne Grading System. The students with acne were then given self-reported Cardiff Acne Disability Index questionnaire.

Clinical diagnosis was used to determine presence of acne. Facial acne was graded using the Global Acne Grading System (GAGS).¹² The GAGS consider five locations on the face, with a factor at each location based roughly on surface area, distribution, and density of pilosebaceous units. The borders on the face are delineated by the hairline, jaw line and ears. No magnifying glass or skin stretching was allowed, and good lighting was suggested. In this study all the manifestations of acne from comedones to nodules, not only by its presence but also number, were reported. Each of the location was graded separately on 0–4 scale, with the most severe lesion within that location determining the local score. The researcher then graded acne severity according to the

global score which is the summation of all local scores. The maximum score was 32.

Cardiff Acne Disability Index (CADI) is a well-validated self-reported questionnaire consisting of five questions with a Likert scale, four response categories (0–3).¹³ The final score ranges from 0–15. The Cardiff Acne Disability Index is designed for use in teenagers and young adults with acne. The five questions relate to feeling of aggression, frustration, interference with social life, avoidance of public changing facilities and appearance of the skin—all over the last month—and an indication of how bad the acne was now. The CADI score was calculated by summing the score of each question resulting in a possible maximum of 15 and minimum of 0. CADI scores were graded as low (0–4), medium (5–9) and high (10–15). The lower the cumulative CADI score, the lower the level of disability experienced by the student while a higher score indicated a higher level of disability. The CADI identifies area of concern in patients with acne. The patients' response to the questionnaire is significantly correlated with the clinicians' assessment of acne severity.

Data was analysed using SPSS (Statistical Package for Social Studies) programme (version 11; SPSS Inc., Chicago). The level of significance was set at $p < 0.05$ and confidence interval, CI=95%. Statistical tests used were Chi-square test, Spearman Correlation Coefficient and Kruskal Wallis for skewed distribution data.

Permission to use Cardiff Acne Disability Index had been obtained from Professor Andrew Finlay from the Department of Dermatology, University of Wales College of Medicine, Cardiff, UK. This study was approved by the Research and Ethics Committee, Faculty of Medicine, University Kebangsaan Malaysia and the Ministry of Education, Malaysia.

Results

The response rate was 89.5%. In total, 409 students were examined and completed the questionnaire from the original sample of 457 students selected for the study. The non-respondents were mainly due to the inability to obtain consent from the parents (6.6%) or the students themselves (3.9%). The students comprised 229 girls (56%) and 180 boys (44%). The age ranged from 13 to 18 years old. The mean age of the students was 15.08 ± 1.43 years. The majority of the students were Malays (58.9%), followed by Chinese (40.8%) and Indians (0.2%).

Using the GAG system, 133 (32.5%) students were rated by the researcher as having no acne. Overall, the prevalence of acne was 67.5%. Facial acne was more common among males ($n=128$, 71.1%) than females ($n=148$, 64.6%). The acne prevalence increased with age ($p=0.001$). (Refer to Table 1.)

Cardiff Acne Disability Index

The maximum CADI score was 13 in both female and male students. The median score was 4 (2.0–5.0) which implied that the majority of them had mild psychological impact.

Based on the specific responses of CADI, 71.1% of the students reported that they felt aggressive, frustrated or embarrassed as a result of having acne and pimples (refer Table 3).

Table 1. Prevalence of acne among the adolescents

	Presence of acne		No acne		Total		p value
	n	%	n	%	n	%	
Gender							
Male	128	71.1	52	28.9	180	100	0.165
Female	148	64.6	81	36.4	229	100	
Age (years)							
13	31	44.2	39	55.7	70	100	0.001
14	57	64.0	32	36.0	89	100	
15	54	66.7	27	33.3	81	100	
16	65	76.5	20	23.5	85	100	
17	60	81.0	14	19	74	100	
18	9	90.0	1	10	10	100	
Ethnicity							
Malay	155	64.3	86	35.7	241	100	0.084
Chinese	121	72.5	46	27.5	167	100	
Total	276	67.5	133	32.5	409	100	

The majority of students from age 13 to 18 years old had mild facial acne (90.2%) (refer table 2)

There was a significant difference between acne severity and gender ($\chi^2 = 16.47$, $p=0.001$). However, there was no significant difference between facial acne severity and ethnicity ($\chi^2 = 1.56$, $p>0.05$) (refer to Tables 4 and 5).

There was a moderately strong correlation between facial acne severity and Cardiff Acne Disability Index ($\rho=0.521$) at $p=0.01$ (Figure 1). (Correlation coefficient, $\rho<0.3$ poor, $0.3-0.5$ fair, $0.5-0.8$ moderate strong, >0.8 very strong). The impact on quality of life increased with the facial acne severity.

There was no association between CADI score and gender: Mann-Whitney test (z score= 0.046 , $p=0.964$). It is an important finding, as there may be a perception among some health professional that facial acne will have less impact on males. It showed that males were also aware of their skin problems.

Discussion

This study showed that facial acne is a common problem among adolescents in Muar, affecting 71.1% of boys and 64.6% of girls. A study done in Turkey using Global Acne Grading System, reported that the prevalence of acne among high school students was 23.1%.¹⁴ The difference in prevalence rates between these two studies may reflect ethnic differences or the involvement of trunk examination which may limit participation of the adolescents. An Australian study showed that overall prevalence of acne was 36.1%.¹⁵ In another study using Leeds Acne Grading Scale, reported the prevalence of acne in UK teenagers as 50%.¹⁶ Comparisons of prevalence rate between studies are hampered by the varied methods of acne grading used by different studies and the wide range of diagnostic criteria used. For this reason, in this study it was best to report all the manifestations of acne from comedone to nodules, not only by its presence but also number. The researcher then graded acne severity according to the global score which is the summation of all local scores. Again, there is no internationally agreed system for reporting severity, although various systems have been recommended. Nevertheless, Global Acne Grading System has been

Table 2. Severity of facial acne by age, gender and ethnicity

	Acne Severity			Total
	Mild n (%)	Moderate n (%)	Severe n (%)	n (%)
Age (years)				
13	29 (93.5)	2 (6.5)	0 (0)	31 (100)
14	53 (93.0)	4 (7.0)	0 (0)	57 (100)
15	47 (87.0)	4 (7.4)	3 (5.6)	54 (100)
16	57 (87.7)	6 (9.2)	2 (3.1)	65 (100)
17	55 (91.7)	3 (5.0)	2 (3.3)	60 (100)
18	8 (88.9)	1 (11.1)	0 (0)	9 (100)
Overall	249 (90.2)	20 (7.3)	7 (2.5)	276 (100)
Gender				
Males	106 (82.8)	15 (11.7)	7 (5.5)	128 (100)
Females	143 (96.6)	5 (3.4)	0 (0)	148 (100)
Ethnicity				
Malay	136 (87.7)	13 (8.4)	6 (3.7)	155 (100)
Chinese	113 (93.4)	7 (5.8)	19 (0.8)	139 (100)

Table 3. Specific responses of Cardiff Acne Disability Index

Specific responses of CADI (N = 276)	Frequency (n)	Percentage (%)
Felt aggressive, frustrated	196	71.0
Social interference	162	58.7
Avoidance of public changing	49	17.8
Patient psychological state	225	81.9
Subjective assessment of acne severity (perceived as problem)	251	90.9

Table 4. Relationship between acne severity and gender

Acne severity	Male (n)	Female (n)	Test	p value
Mild acne	106	143	$\chi^2 = 16.47$	0.001
Moderate to severe acne	22	5		
TOTAL	128	148		

Table 5. Relationship between facial acne severity and ethnicity

Acne severity	Malay (n)	Non-Malay (n)	Test	p value
Mild acne	136	113	$\chi^2 = 1.56$	0.21
Moderate to severe acne	19	26		
TOTAL	155	139		

found to be accurate and have minimal inter- and intra-rater variability.¹¹

The findings in this study showed that acne prevalence increased with increasing age. This finding is similar to a previous study done in Australia.¹⁴ In this study, the male students were found to have more moderately severe acne compared to female students. The findings are consistent with previous studies done in other countries.^{14,15,16,17} Males tend to have more severe acne compared to females because they have oilier complexion and their androgen levels are higher.^{18,19}

Cardiff Acne Disability Index helps to assess the quality of life in students with acne. The subscales include feeling of aggression, frustration, interference with social life, avoidance of public changing facilities and appearance of the skin. In this study, analysis of the subscales showed that the adolescents had particular difficulties in the areas of emotion (felt aggressive, frustrated), social interference/difficulties and psychological state disturbance. A study among teenage Scottish schoolchildren reported that 50% of pupils were emotionally affected by their acne. Twenty percent of pupils were affected in their personal and social lives because

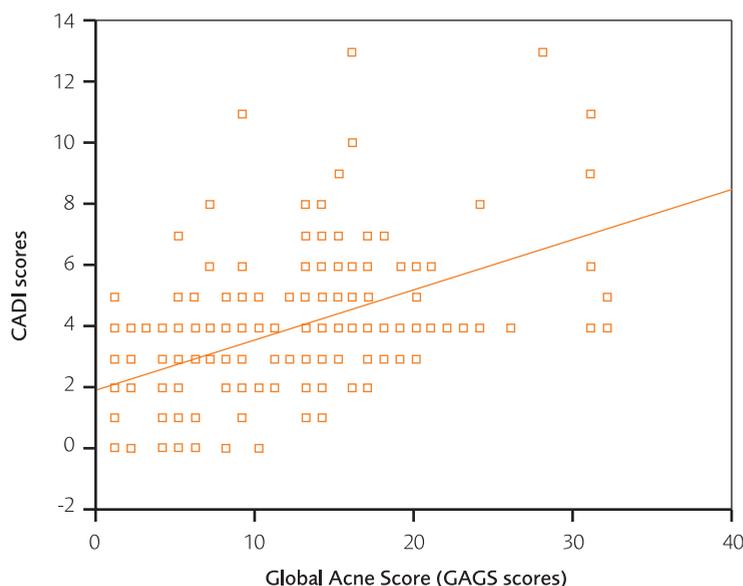
of their acne and 10% avoided swimming and other sports because of embarrassment.²⁰ In this study, five students (1.8%) scored 13 in Cardiff Acne Disability Index which was equal to severely impaired. It implied that the students had severe psychological impact from facial acne problem. However, the median score of CADI was 4, which was low. This implied that overall the students were mildly affected psychologically. This could be due to the higher prevalence of mild acne among the students. It also showed that the impact of acne on the students was influenced by the acne severity.

This study demonstrated a moderately strong correlation between the total score of Cardiff Acne Disability Index and acne severity. The impact on quality of life increased with the facial acne severity. This result is consistent with previous studies which also demonstrated a fairly good correlation between facial acne severity and Cardiff Acne Disability Index.^{15,20,21} This implies that impact of acne on quality of life must be considered in the management of facial acne.

Overall, there was no significant difference in the CADI score between the genders (Mann-Whitney test, $p > 0.5$). The impact of acne on quality of life was similar between genders. However, this contradicts results from previous studies which found that girls generally experience more psychological morbidity than boys.²² The finding in this study is important as there may be perception among some health professionals that facial acne will have less impact on males. This study showed that male adolescents were also aware of their skin problems.

The major limitation of this study is its cross-sectional design. A prospective study would be better to demonstrate a direct causal link between acne and quality of life. Although we obtained a good response rate, it is possible that students who either refused to take part or who were absent represent more vulnerable adolescents or those most embarrassed by their skin. The study is likely therefore to have underestimated the impact of acne on quality of life. In this study, the CADI and GAG scores (especially the CADI) were quite skewed. Dichotomising the scores would perhaps demonstrate better results.

Figure 1. Spearman's rho coefficient demonstrating correlation between Global Acne Grading Score and Cardiff Acne Disability Index.



Conclusion

Facial acne is common among adolescents and can cause major impact on their quality of life. It is important for the health professionals to incorporate quality of life measurements when managing adolescents with acne. Cardiff Acne Disability Index is a useful tool to identify individual with facial acne who had poor quality of life. Health education is needed in our secondary schools to ensure that adolescents understand their disease, know what treatments are available and from whom they should seek advice. Health professionals should be aware that early acne treatment can prevent progression of the disease and its complication.

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COMPETING INTERESTS

None declared.