

Prevalence of acne and its impact on the quality of life in high school-aged adolescents in Yazd, Iran

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Abstract *Objective* To assess the prevalence of acne and its impact on quality of life in high school aged adolescents in Yazd, Iran.

Patients and methods This was a cross-sectional study. High schools were selected using stratified cluster random sampling through two regions of Yazd. The acne severity was graded using Global Acne Grading System. The students with acne were then given self-reported Cardiff Acne Disability Index questionnaire.

Results Overall, the prevalence of acne was 85.9%. The disease was more common among females than males (90% vs. 81.4%). However, severe forms were more common among males ($p=0.003$). The acne prevalence did not increase with age ($p=0.089$). There was a correlation between acne vulgaris severity and Cardiff Acne Disability Index ($p=0.001$). The impact on quality of life increased with the acne severity. There was no association between Cardiff Acne Disability Index score and gender ($p=0.185$).

Conclusion Acne vulgaris is a common disorder and has a considerable impact on quality of life among adolescents.

Introduction

Humans are social existents who need to interact with each other, both verbally and physically. Factors that impair these functions may have significant psychological consequences.¹ Acne vulgaris is the most common dermatological condition encountered in adolescents. It affects almost 85% of people 12-24 years of age.² Adolescence is a time of struggle for self-identity when teens and young adults have a need to look their best, they frequently have acne, which makes them feel and look their

worst.¹ Therefore, it is not surprising that vulnerable patients with acne are prone to significant psychosocial disability. Acne patients are prone to psychological problems such as social withdrawal, anger, anxiety and depression. In addition, patients with acne have a higher unemployment rate than adults without acne.³

Importance of assessing disease effects on the patient's quality of life has been determined through recent years.^{4,5,6} In clinical practice, understanding how a patient's life is impacted by disease allows us to understand the disease from the patient's point of view and can help us in selecting the most appropriate treatment for that patient and may enhance compliance.⁷ Therefore, quality of life index can also be a measure of treatment success.¹

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Patients and methods

This was a cross-sectional study. The calculation of sample size was performed using this formula $n = [z/\alpha]^2 \times p [1-p]$, where n is a sample size, z is the confidence interval taken as 1.96, α is taken as 0.05 and p is the probability in this study and taken as prevalence of acne vulgaris in adolescence which is about 85%. 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.

Twenty-one high schools were selected using stratified cluster random sampling through two regions of Yazd. These schools comprise Form 1 to Form 4 students.

With the approval of the headmasters of the secondary schools, the lists of students were obtained from the school registration books. The study population was stratified into four strata based on their forms; form 1 to form 4. In each stratum, the samples were selected randomly. Eventually sample size compromised of 420 students. The informed consent letter describing the research was given to the selected students and their parents. 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. 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 were reported. The acne severity was then graded using Global Acne Grading (GAG) System. The students with acne were then given self-reported Cardiff Acne Disability Index

(CADI) questionnaire. 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.

Data were analyzed using SPSS (Statistical Package for Social Studies) program.

Results

420 students were examined and received the questionnaire. The final number of completed questionnaires returned was 419. Therefore, the response rate was 99.8%.

The students comprised 220 (52.5%) girls and 199 (47.5%) boys. The age ranged from 15 to 18 years. The mean age of the students was 16.5 ± 1.12 years. Using the GAG system, 59 (14.1%) students were rated by the researcher as having no acne. Overall, the prevalence of acne was 85.9% (**Table 1**). Acne was more common among females than males (90% vs. 81.4%). The acne prevalence did not increase with age ($p=0.089$). 8.4% of participants believed that their disease was severe while 3.4% of them had clinically severe disease. The maximum GAGS scores were 32 in females and 41 in males. However, severe forms were more common among males ($p=0.003$), there was no significant difference between acne severity and gender. Quality of life was assessed by means of CADI questionnaire (**Table 2**). The maximum CADI score was 12 in both female and male students. The median score was 3.8 ± 2.69 . There was no association between Cardiff Acne Disability Index score and gender ($p=0.185$). 4.9% of males (8 student) and 3.5% of females (7 students) had low quality of life. Specific responses of CADI questionnaire are shown in **Table 3**.

Table 1 Distribution of acne severity by gender in the Yazd high school students. Severe forms of acne were more common among males (Pearson Chi-Square test, $p=0.003$).

Acne severity	Female		Male		Total N (%)
	N (%)	N (%)	N (%)	N (%)	
Mild	172 (86.9)		118 (72.8)		290 (80.6)
Moderate	24 (12.1)		34 (21)		58 (16.1)
Severe	2 (1)		8 (4.9)		10 (2.8)
Very severe	0 (0)		2 (2.1)		2 (0.6)
Total	198 (55)		162 (45)		360 (100)

Table 2 Distribution of acne severity and its effect on the patient's quality of life by gender in Yazd high school students.

Decreased quality of life	Mild acne		Moderate acne		Severe acne		Very severe acne		Total	
	Female N (%)	Male N (%)	Female N (%)	Male N (%)	Female N (%)	Male N (%)	Female N (%)	Male N (%)	Female N (%)	Male N (%)
Mild	126 (43.5)	86 (29.7)	8 (13.8)	18 (31)	0 (0)	4 (40)	0 (0)	0 (0)	134 (37.2)	108 (30)
Moderate	41 (14.1)	30 (10.3)	14 (24.1)	11 (19)	2 (20)	3 (30)	0 (0)	2 (100)	57 (15.8)	46 (12.8)
Severe	5 (1.7)	2 (0.7)	2 (3.5)	5 (8.6)	0 (0)	1 (10)	0 (0)	0 (0)	7 (2)	8 (2.2)
Total	172 (59.3)	118(40.7)	24 (41.4)	34(58.6)	2 (20)	8 (80)	0 (0)	2 (100)	198 (55)	162 (45)

Table 3 Specific responses of Cardiff Acne Disability (CAD) Index.

CAD question	Very much	A lot	A little	Not at all
	N (%)	N (%)	N (%)	N (%)
1. As a result of having acne, during the last month have you been aggressive, frustrated or embarrassed?	11 (3.1)	53 (14.7)	158 (43.9)	138 (38.3)
2. Do you think that having acne during the last month interfered with your daily social life, social events or relationships with members of the opposite sex?	12 (3.3)	40 (11.1)	97 (27)	211 (58.6)
3. During the last month have you avoided public changing facilities or wearing swimming costumes because of your acne?	6 (1.7)	20(5.6)	56 (15.5)	278 (77.2)
4. How would you describe your feelings (concern) about the appearance of your skin over the last month?	24 (6.6)	74 (20.5)	179 (49.6)	84 (23.3)
5. Please indicate how bad you think your acne is now?	4 (3.9)	56 (15.6)	202 (56.1)	88 (24.4)

There was a correlation between acne vulgaris severity and Cardiff Acne Disability Index ($p=0.00$). The impact on quality of life increased with the acne severity.

Discussion

The overall prevalence of acne in this study was 85.9% and it was more common in females than males, confirming previous findings that acne is common in adolescents.⁸⁻¹⁰ However, the prevalence of acne was reported lower in some studies.¹¹⁻¹³ The difference in prevalence rates between these two groups of studies may reflect ethnic variation. Comparison of prevalence rate between studies is 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 comedones to nodules, not only by its presence but also number. The researchers 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 found to be accurate and have minimal inter- and intrarater variability.¹⁴

The findings in this study showed that acne prevalence and severity did not increase with increasing age. This finding is in contrast to a previous study done by Hanisah *et al.*⁸ in Malaysia in which acne severity was determined by means of GAGS. Hanisah *et al.*⁸ did their study in two high schools and sample size in

each age group was not similar. A study done in Iran by Baghestani *et al.*¹⁵ using Lehman criteria reported no association between age and acne severity.

In this study, the male students were found to have more moderately severe acne compared to female students ($p=0.003$). The findings are consistent with previous studies done in other countries.^{8,10,15} Males tend to have more severe acne as compared to females because they have oilier complexion and their androgen levels are higher.^{16,17}

Cardiff Acne Disability Index helps to assess the quality of life in students with acne. The CADI contains five questions that focus on feelings, symptoms (aggression/ frustration/ embarrassment), social life, avoidance of public changing facilities and perceived acne severity (maximum possible score 15). Examination of responses to individual questions is important when evaluating QoL measures. The higher scoring questions (maximum score 3 per question) on the CADI questionnaires were those pertaining to psychological state disturbance, emotions and feelings and social interference/difficulties. Lower scoring questions pertained to avoidance of public changing facilities or wearing swimming costumes activities. These findings were similar to previous study results.^{8,18,19}

In line with previous research, our results confirm that acne is associated with significant morbidity and decrease in QoL. Although the overall mean total CADI scores were low (3.8 ± 2.69). This implied that overall the students were mildly affected psychologically. This could be due to the higher prevalence of mild acne among the students.^{8,15,18,19} It also showed that the impact of acne on the students was influenced by the acne severity.

This study demonstrated a correlation between the total score of Cardiff Acne Disability Index and acne severity. The impact on quality of life increased with the 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.^{8,18,19} However, in the studies which were done by Kokandi²⁰ and Demircay *et al.*³ no association were reported between decreased quality of life and acne severity. These results may be due to different material and method of these two studies, in which participant acne patients were attending acne outpatient clinics.

Overall, there was no significant difference in the CADI score between the genders. Like previous studies, the impact of acne on quality of life was similar between genders.^{8,18,19} However, this contradicts results from some studies which found that girls generally experience more psychological morbidity than boys.^{15,16}

It is important to note that a significant number of cases in this study had high CADI scores (4.2%), indicating a high psychosocial burden from acne. Acne is known to cause depression and even suicidal ideation and teenagers are thought to be particularly vulnerable to such risks.²¹

Conclusion

Facial acne is common among adolescents and can cause major impact on their quality of life. There is a correlation between patient's quality of life and acne severity. Quality of life is similar in both genders. It is important for the health professionals to incorporate quality of life measurements when managing adolescents with acne. 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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