

Prevalence rate, risk factors of acne vulgaris and its impact on the quality of life among teen-agers in Qena city, Upper Egypt

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Abstract:

Objectives: determine the prevalence of acne vulgaris among teen-agers in Qena city, determine the risk factors of acne vulgaris, and determine the effect of acne vulgaris on the quality of life among teen-agers in Qena city.

Patient and methods: The study includes 200 students in Qena secondary schools, the students were asked to fill in 2 questionnaires, the first include personal data and the other include is CADI.

Results: the prevalence of acne vulgaris in Qena secondary school students was 58, acne vulgaris was more prevalent in males (53.5%) than females (46.5%). In addition, We found 5 risk factors associated with AV, the most contributing risk factor for AV of these 5 risk factors was stress (AOR = 18.85, 95% CI 6.313-56.281), regular eating of spicy food (AOR = 13.364, 95% CI 4.525-39.465) and the least contributing risk factor was eating fast food. In our study CADI score was significantly related to the disease grade, being maximum among those with severe grade, followed by moderate and lastly mild disease grade.

Conclusion: Acne vulgaris is prevalent among Qena teen-agers, stress and dietary factors are important risk factors of acne, CADI score was significantly related to the disease grade.

Keywords: acne vulgaris, teen-ageers, Qenacity, prevalence, CADI.

Introduction:

Acne, is a chronic inflammatory disease which affects the hair follicles and sebaceous glands in the skin forming comedons, pustules, nodules and scarring in severe cases. Acne vulgaris (AV) is considered the most dominant skin disease among adults in the world, acne affects more than 85% of adults between ages of 13-24 years (Grice and Segre, 2011). It is a severe form of chronic inflammatory skin disease that affects the pilosebaceous follicles (Morrone et al., 2011). The pathogenesis of The bacteria affect monocytes by triggering proinflammatory cytokines such as tumor necrosis factor (TNF)- α , and IL-8, interleukin (IL-1)- β . Chemotactic factor IL-8 is essential in attracting neutrophils, T cells to the site of pilosebaceous unit to start chronic inflammation. Actually, the too much secretion of proinflammatory cytokines is correlated with the degree of acne severity (Bhate and Williams, 2013).

There is many risk factors of acne vulgaris such as hormonal imbalance, smoking, use of Cosmetics, hereditary factors and androgen excess (Kendall and Nicolaou, 2013).

Disorders which affect the skin mainly that which taking a chronic form and present on exposed areas of body, may lead to low self-confidence and nervousness symptoms mainly

AV include follicular hyperkeratinization, increase in sebum production, increased Propionibacterium colonization of Propionibacterium acnes (P. acnes), hormonal imbalance, , oxidative stress, and altered immunological responses. Although the strict pathophysiology of AV remains uncertain, it is recognized that Gram-positive anaerobic bacteria P.acnes plays an important role in starting the inflammation (Melnik, 2018).

in adult females. Patients with chronic illnesses may have emotional problems which have bad effects on their social activity and quality of life (Gupta, 2014).

Patients and Method:

Study Setting and Design: School based cross sectional study in four secondary schools Abu bakr El saddiq secondary schools for boys and El salam secondary school for boys, Qena secondary school for girls and Fatma El Zahraa secondary school for girls at Qena city.

Study Population: Study population included students in the 1st, 2nd and 3rd Secondary year of education. The total sample was distributed among general education schools proportionate to the number of students in each type of education.

Sample Size and Sampling Procedures:

Sample Size Calculation
 $(N = (z_{1-\alpha/2})^2 P(1-P)/D^2)$. Where n is the sample size, Z is standard normal variant (at 5% type 1 error (P<0.05) it is 1.96. P(expected proportion in population based on previous studies or pilot studies)= 85%, d (absolute error or precision)=0.05. The level of confidence usually aimed for is 95%. the result was 195 case we raised the sample to 200 case to get more informative results.

Data Collection:

Data was collected by two self-administered structured questionnaires.

Questionnaire 1: included Personal data, data about possible risk factors for acne (stress, eating habits, chocolate intake, use of cosmetics, family history, menstrual irregularities and frequent face washing).

Questionnaire 2: Students who have acne were asked to fill a self-reported Cardiff Acne Disability Index (CADI) questionnaire, Arabic version to assess the resulted disability from acne. The Cardiff Acne Disability Index is planned for use in adolescents, and even young adults with acne. CADI questionnaire includes five statements with a Likert scale, four grades (0–3). The total score ranges from 0–15. The

five statements are aggressive feeling or frustration, social life disturbance, public avoidance, concern about facial appearance and an indication of how bad the acne was. The CADI score was calculated by summing the score of every statement resulting in a possible highest score of 15 and least score of 0. CADI scores were classified as low (0–4), medium (5–9) and high (10–15). The lesser the CADI score, the minimal disability experienced by the teenager or adolescent while a greater score indicated a major disability.

Statistical Analysis:

Statistical analysis was done by compatible computer using software SPSS version 23 for windows. Frequencies, descriptive statistics, correlation, ANOVA test and regression analysis were done. The probability of less than 0.05 was used as cut off point for all significant tests.

Results:

A total of 200 teenagers were assessed aged between 16.5-18 years (mean \pm SD 17.291 \pm .9119). The overall prevalence of acne was 58% (Figure 1). The majority of students had mild acne (28%) followed by moderate acne (24%), severe acne (6%) (Figure 1). AV was more common among males 69.8 % than females

47.7%. Regarding CADI, (48.8%) of subjects have mild disability, (41.4%) have moderate disability while (13.8%) have severe disability (Figure 2). The risk factors of acne vulgaris among teenagers are shown in Table 1. There was a significant relation between acne and

family history of acne , stress, dietary factors (p= 0.000) for all, but there is statistically in significant relationship between acne and smoking (p=0.691), frequent face washing (p=0.980).



Figure 1: prevalence of acne vulgaris

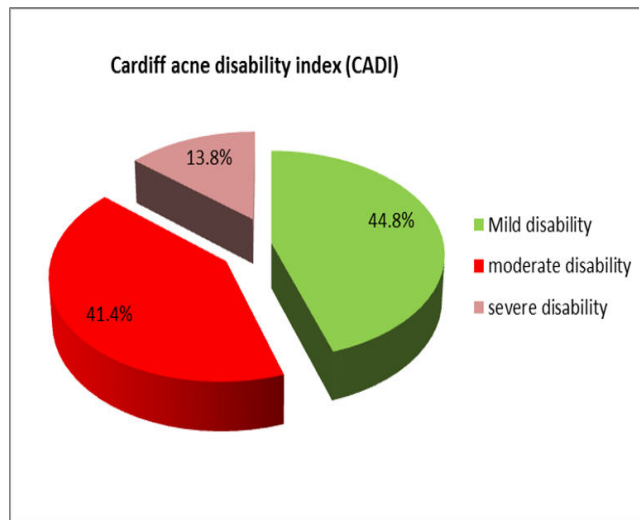


Figure2: Cardiff acne disability index among the studied group

Table1 : Risk factors of acne vulgaris

Variable		Noacne (48 cases)	Mild acne 65 cases)	Moderate (48 cases)	Severe acne 12 (cases)	P value
Family history of acne	Yes	16(19%)	24(42.9)	16(33.3%)	11(91.7)	0.000*
	No	68(81%)	32(57.1%)	32(66.7%)	1(8.3%)	
Skin type	Normal	19%	17.9%	16.7%	16.7%	0.000*
	Dry	60(71.4)	4(7.1%)	5(10.4%)	00	
	Oily	8(9.5%)	42(75%)	35(72.9)	10(83.3)	
Numbers of face washing per day		9.46±3.6	9.63±3.5	9.42±3.7	9.17±4.3	0.980
Using cosmetics in females	Yes	8(14.3%)	9(33.3%)	16(88.9%)	3(60%)	0.000*
	No	36(64.3%)	13(48.1%)	0(00%)	1(20%)	
	Some times	12(21.4%)	5(18.5%)	2(11.1%)	1(20%)	
presence of stress	Yes	4 (4.8%)	27(48.2%)	19 (39.6%)	6 (50%)	0.000*
	No	58 (69%)	22(39.3%)	18 (37.5%)	0 (0%)	
	Some times	22(26.2%)	7 (12.5%)	11 (22.9%)	6 (50%)	
Smoking	Yes	11(13.1%)	8 (14.3%)	4 (8.3%)	1 (8.3%)	0.691
	No	70(83.3%)	46(82.1%)	42 (87.5%)	9 (75%)	
	Sometimes	3 (3.6%)	2 (3.6%)	2 (4.2%)	2 (16.7%)	
Regular eating of spicy food	Yes	4 (4.8%)	16(28.6%)	28 (58.3%)	5 (41.7%)	0.000*
	No	60 (71.4%)	28 (50%)	20 (41.7)	7 (58.3%)	
	Sometimes	20(23.8%)	12(21.4%)	0 (0%)	0 (0%)	
eating of fast food	Yes	31(38.1%)	32(57.1%)	36 (75%)	4 (33.3%)	0.000*
	No		16(28.6%)	0 (0%)	8(66.7%)	
	Some times	0 (0%)	8 (14.3%)	12 (25%)	0 (0%)	
drinking ofmilk	Yes	17(20.2%)	39(69.6%)	33 (68.8%)	5 (41.7%)	0.000*
	No	42(50%)	13(23.2%)	7 (14.5%)	5 (41.7%)	
	Some times	25(29.8%)	4 (7.2%)	8 (16.7%)	2(16.6%)	

Table2: Multivariate analysis for risk factors of acne vulgaris.

Factors	Odds ratio	95% CI *	P-value
Stress	18.85	6.313-56.281	.001
Regular eating of spicy food	13.364	4.525-39.465	.001
Regular drinking of milk	7.609	3.697-15.661	.001
Using cosmetics	7.25	2.635-19.946	.001
Regular eating of fast food	4.875	2.575-9.229	.001

Discussion:

In our study, the prevalence rate of acne vulgaris was 58%. Similar results were reported by (**Abo El-Fetoh et al., 2016**) in the Northern region of Saudi Arabia, which reported the prevalence of Acne vulgaris was 53.5%. It more common among males 69.8% than females 47.7%. But in a study conducted by (**El-Hamd et al., 2017**).in Sohag, Upper Egypt there was female predominance among their cases (1.53 : 1). Our study show that, 56% of the students had mild grade of acne vulgaris, 48% had moderate grade, and only 12% had severe grade of acne. This results are similar to that obtained by Dreno et al. where (43%) had mild acne, (41%) had moderate acne, and (16%) had severe acne(**Dreno et al., 2019**).

We found that, familial history of acne was significantly associated with the development of AV (p = 000). Similar results are obtained by

Bagatin et al., 2014, from a study conducted on adolescents from Sao Paulo. The relationship between regular eating of fast food and AV was statistically significant (p = 000). Similar results were obtained by **Koku et al., 2012** from a cross-sectional study in adolescents in the city of Eskisehir. The relationship between regular drinking of milk and AV was statistically significant (p = 000). Similar results were obtained by **Dai et al.(2018)** from comprehensive databases search of PubMed, Embase, Medline and Cochrane library. The relationship was statistically non-significant between smoking and AV (p = 0.691), in contrast, in across-sectional online survey of adolescents/young adults in 7 European countries They found that smoking tobacco (OR 0.705, 95% CI 0.616 to 0.807) were associated with a reduced probability of acne(**Wolkenstein et al., 2018**).

In our study CADI score was significantly related to the disease grade, being maximum

among those with severe grade, followed by moderate and lastly mild disease grade as 66.7% of patients (N=8) with severe degree of acne had severe CADI, 58.3% of patients (N=28) with moderate degree of acne had moderate CADI and 64.3% of patients (N=36) with mild degree of acne had mild CADI (P-value = 0.000). Our results were similar to these

seen by Pradhan et al. who found that impairment of quality of life was significantly related to the grade of acne (**Pradhan et al., 2018**).

Conclusion: Acne vulgaris is prevalent among Qena teen-agers, stress and dietary factors are important risk factors of acne.

References:

Bagatin E, Timpano DL, Guadanhim LRDS, Nogueira VMA, Terzian et al., (2014). Acne vulgaris: prevalence and clinical forms in adolescents from São Paulo, Brazil. *Anais brasileiros de dermatologia*, 89(3): 428-35.

Bhate K, Williams HC. (2013). Epidemiology of acne vulgaris. *British Journal of Dermatology* Mar, 168(3):474-85.

Dai R, Hua W, Chen W, Xiong L, Li L. (2018). The effect of milk consumption on acne. *Journal of the European Academy of Dermatology and Venereology*, 32(12):2244-53.

Dreno B, Bordet C, Seite S, Taieb C & 'Registre. (2019). Impact on quality of life and productivity. *Journal of the European Academy of Dermatology and Venereology*, 33(5): 937-43.

El-Hamd MA, Nada ED, Moustafa MAK., Mahboob-Allah RA. (2017). Prevalence of acne vulgaris and its impact of the quality of life among secondary school-aged adolescents in Sohag Province, Upper Egypt. *Journal of cosmetic dermatology*, 16(3): 370-73.

Grice EA, Segre JA. (2011). The skin microbiome, *Nat Rev Microbiol*, 9: 244–53.

Gupta MA, Gupta AK. (2014). Current concepts in psychodermatology. *Current psychiatry reports*. Jun 1; 16(6):449.

Kendall AC, Nicolaou A. (2013). Bioactive lipid mediators in skin inflammation and immunity. *Prog Lipid Res*, 52: 141–164.

Koku Aksu AE, Metintas S, Saracoglu ZN, Gurel G, Sabuncu I, Arikan I et al., (2012). Acne: prevalence and relationship with dietary

habits in Eskisehir, Turkey. *Journal of the European Academy of Dermatology and Venereology* ;26(12):1503-9.

M Abo El-Fetoh N G, Alenezi N G, Alshamari NG, Alenezi O. (2016). Epidemiology of acne vulgaris in adolescent male students in Arar, Kingdom of Saudi Arabia, 144-9.

Melnik BC.(2018). Acne vulgaris: The metabolic syndrome of the pilosebaceous follicle. *Clinics in dermatology*, 1;36(1):29-40.

Morrone A, Franco G, Valenzano M. (2011). Clinical features of acne vulgaris in 444 patients with ethnic skin. *J Dermatol*, 38(4):405–8.

Pradhan M, Jha CB,Rai D.(2018).The Impact of acne on the quality of life of the patients at Nobel Medical College Teaching Hospital. *Journal of Nobel Medical College*, 7(1): 45-49.

Wolkenstein P, Machovcova A, Szepietowski JC, Tennstedt D, Veraldi S,Delarue A.(2018).Acne prevalence and associations with lifestyle. *Journal of the European Academy of Dermatology and Venereology*, 32(2): 298-06.