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Prevalence and Clinical Characteristics of Acne Vulgaris among Anbar Medical Students in Ramadi City, Iraq

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ABSTRACT

Background: Acne vulgaris is a common chronic skin condition affecting a significant proportion of adults and 85% of adolescents. Acne is frequently underestimated in Anbar governorate, despite anecdotal evidence suggesting a high prevalence.
Objectives: To identify the prevalence and clinical characteristics of acne among medical students in the College of Medicine, University of Anbar.
Materials and methods: A cross-sectional survey was conducted from October 2024 to April 2025 among all Anbar medical students. Cases of acne have been enrolled for assessment of prevalence and severity. Duration of disease, food type, drug history, sites, severity, scarring grade, body mass index, and complications have been studied.
Results: Out of 1218 medical students, 270 (22.16%) were diagnosed with acne. The mean age was 19.72 ± 2.15 years. The female-to-male ratio was 1.5:1. The most affected site was the face, followed by the back, while the chest was the least commonly involved. Nearly a third of participants had moderate acne. The most frequent complication was erythema, followed by scarring and hyperpigmentation. The association between acne severity and dietary factors was statistically significant for spicy foods (P-value = 0.006) and cola (P-value = 0.002), but not for sweets (P-value = 0.148).
Conclusion: Acne vulgaris is a prevalent condition among Anbar medical students. The multifactorial nature of acne highlights the need for awareness among young adults. The strong association between acne severity and scarring reflects the importance of early and effective treatment to minimize scar formation.
Keywords: Medical students; Prevalence of acne; Acne scars; Anbar.

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INTRODUCTION

Acne vulgaris is a common clinically recognized chronic inflammatory or non-inflammatory dermatological condition that mainly affects the face, neck, chest, shoulders, and back [1]. The most critical factors involved in the pathophysiology of acne are excessive sebum production, epithelial hyperkeratinization, the rise of *Cutibacterium acnes* colonization in the pilosebaceous unit, and an inflammatory reaction. Recent research has shown that the development of acne, and its severity, can be influenced by a variety of epidemiological risk factors, including non-modifiable ones like positive family history or genetic predisposition, along with hormonal influences related to age and sex, lifestyle habits (such as consuming alcohol, cigarette smoking, and physical activity), and eating specific foods [2, 3].

Lesion counting and clinical grading are two commonly used methods for assessing acne severity [4]. Clinical grading of inflammation and a method that involves analyzing the dominant lesions, evaluating the occurrences of inflammation, and quantifying the degree of involvement. The acne lesion counting-based approach, on the other hand, counts the number of a particular type of acne lesion before assessing its overall severity [5].

Although acne is assumed to be a cosmetic problem, in fact, it can cause long-lasting scars, redness, hyperpigmentation, and non-inflammatory closed and open comedones,

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psychological impact, and a lower quality of life, especially in young adults going through social and academic transition [6]. It may also adversely affect an individual's capacity to work, and it has been shown to discourage participation in sports activities [7].

Globally, acne affects a significant proportion of adults and an 85% of adolescents [6]. Despite anecdotal evidence of a high prevalence, acne in the Middle East, especially Iraq, is still underreported in epidemiological literature [8]. Unfortunately, studies have revealed that acne vulgaris commonly affects young adults, particularly medical students, with reported prevalence rates ranging from 35% to 90%, which can be attributed to a combination of age-related hormonal changes and the stressful environment inherent in medical education [9]. This study analyzed the frequency, degree of severity, and scarring grade of acne, along with some associated epidemiological risk factors, in a sample of medical students at the University of Anbar, trying to highlight the region's distinct clinical difficulties, educational setting, and public health importance. They are considered a high-risk group because of their high levels of psychosocial stress, frequent interactions with their peers, and restricted access to specialized dermatological care.

MATERIALS AND METHODS

A cross-sectional observational study was conducted among medical students at the College of Medicine, University of Anbar, Ramadi, Anbar, Iraq, between October 2024 and April 2025. Ages 18 to 28, current medical college attendance, and the presence of acne lesions verified by a dermatological examination were the inclusion criteria, while the current systemic corticosteroid use, recognized endocrine problems, and refusal to participate were among the exclusion criteria.

A questionnaire was designed and conducted for all medical students from the first to the sixth academic year. Subsequently, patients presenting with acne (inflammatory pustules, papules, and nodules) of both sexes, varying durations, different severity, and scarring, were scheduled to attend an interview at the dermatology and venerology Outpatient Clinic of the Ramadi Teaching Hospital. Two dermatologists did the clinical examination face-to-face to the sites, types (grade of severity), grades of scarring, and complications. A comprehensive history was obtained from each participant, including demographic information, disease duration, and body mass index (BMI). Besides, potential aggravating factors, such as dietary habits (daily consumption of sweets, cola, and/or spicy foods) were reported. Additionally, any associated medical conditions and previous use of anti-acne treatments were documented.

Four types of acne are recognized using typical photographs and lesion numbers. According to the number of inflammatory eruptions, there were on half of the face, acne was divided into the following categories [5]: Mild: 0-5 lesions, moderate: 6-20, severe: 21-50, and very severe: more than 50 lesions. In addition, the post-acne scars were divided into five acne scar grading [5]: Grade 0, or no scars; grade 1, with superficial scars, inconspicuous from a distance, involving less than 25% of the face; grade 2, moderately deep scars, faintly visible from a distance, involving more than 25% but less than 50% of the facial surface; grade 3, deeper scars, clearly visible from a distance, involving at least 50% of the facial surface; grade 4, with the deepest scars that are distinctly visible from a distance, affecting nearly the entire facial surface. Inter-rater reliability was not formally assessed.

Informed consent was obtained from each participant before any data were collected. Optimal privacy, safety, and confidentiality were ensured throughout data collection. The study was conducted in accordance with the principles of the Declaration of Helsinki (1964) and its most recent amendment in October 2024. The current study was approved by the Ethical Approval Committee of the University of Anbar (Reference number: 288, 26 September 2024). A minimum sample size of students was determined using a 95% confidence level, a 5% margin of error, and an estimated 36% prevalence of acne, according to a study conducted in Baghdad [10]. For adjustment of the relatively small population size, the finite population correction (FPC) was applied.

Data information was entered and analyzed using Microsoft Excel 2019 and SPSS (Statistical Package for Social Sciences), version 29 (IBM Corp., Released 2022, Armonk, NY, USA). Variables were summarized using frequencies and corresponding percentages, as well as means and standard deviations. The chi-square test was used to determine whether there is a significant association between variables. A P-value of less than 0.05 was considered a statistically significant difference.

RESULTS

Out of 1218 medical students, only 270 (22.16%) were diagnosed with acne. Their ages ranged from 18 to 24 years. with a mean ± SD of 19.72 ± 2.15 years. The females were 164 (61%), while the males were 106 (39%), yielding a female-to-male ratio of 1.5:1. The highest age group affected was 160 (59%) under 20 years of age (Figure 1).

Based on lesion distribution, the most common site was the face, whereas the least frequent site was the chest (Figure 2).

Most participants presented with mild to moderate acne, and no cases of very severe acne were reported in this study (Figure 3).

Among the reported complications, nearly half a percent (147) of patients presented with erythema (Figure 4).

Regarding the distribution of severity of acne by parameters such as sex, foods, BMI, and complications, there was a non-significant difference between males and females in the existence of other various types of acne severity. Spicy foods, sweets, and cola were identified as dietary risk factors associated with acne severity. In about 40.9% of mild, 50.9% of moderate, and 8.2% of severe acne cases were related to

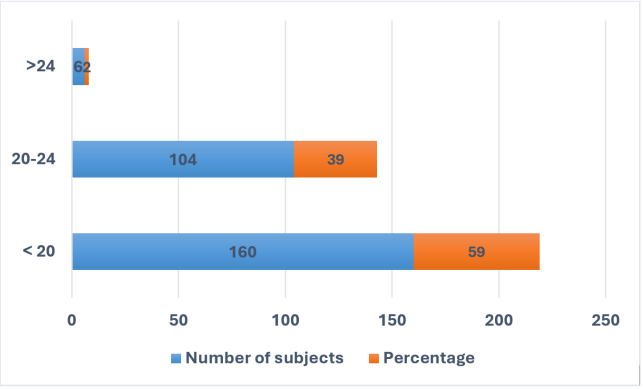

Figure 1. Distribution of acne vulgaris with age (per year) of 270 students.

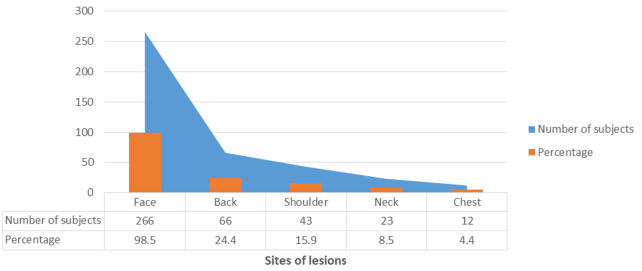

Figure 2. Distribution of acne vulgaris according to the sites of lesion of 270 students.

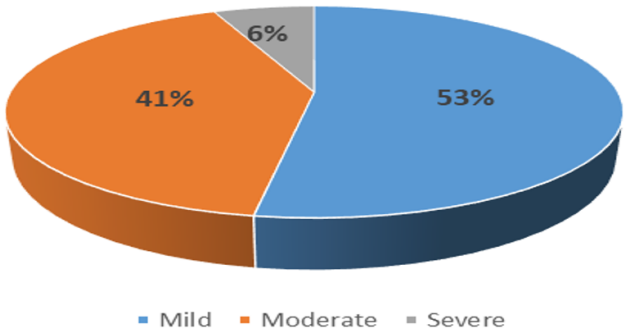

Figure 3. Distribution of acne vulgaris according to the severity of the disease in 270 students.

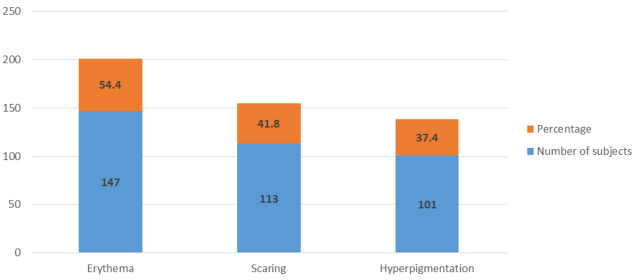

Figure 4. Distribution of acne vulgaris according to the complication.

spicy foods, and the association was highly significant (P-value = 0.006). Similarly, the relationship between acne and cola was highly substantial (P-value = 0.002), but it was non-significant for sweets (P-value = 0.148). The severity of acne was not correlated with BMI, where the P-value was not significant. On the other hand, the complications of acne, such as erythema, scarring, and hyperpigmentation, were extremely statistically significant (P-value = 0.001) in correlation with the severity of acne (Table 1).

Many of the participants (n = 95, 67%), had mild acne/grade 0 scarring, while 32 (22.5%), 13 (9.1%), and 2 (1.4%) had mild acne/ grade 1, 2, and 3 scarring, respectively. None of the mild acne had grade 4 scarring. Among those with moderate acne, 38 (34.2%) had grade 0, 36 (32.4%) had grade 1, 33 (29.7%) had grade 2, 3 (2.7%) had grade 3, and 1 (1.0%) had grade 4 scarring. In contrast, less than 1 (5.8%) of severe acne cases were associated with grade 4 scarring. A statistically significant difference was observed between mild and moderate acne in relation to scar grading (P-value = 0.001), in contrast, no significant difference was found between severe acne and scar grading (P-value = 0.608) (Table 2).

DISCUSSION

Acne vulgaris is one of the most common skin conditions worldwide, and it is impacted by environmental and genetic factors. It is the eighth-most prevalent disease. Although acne vulgaris is regarded as a benign disease that resolves without treatment, the disease has a significant impact [11]. The prevalence of acne among Anbar medical students was 22.16%, and the age group affected was less than 20 years, with a mean age of 19.72 ± 2.15 years. Sadiq et al. reported that the prevalence of acne among Baghdad medical students was 56% in age groups less than or equal to 20 years, while it was 40% in 21-24 years age group. A study among Saudi Arabia medical students/ King Saud University showed that 55.5% had acne [12]. In fact, the prevalence of acne differs across countries and age groups, with estimates suggesting that approximately 85% of adolescents and young adults are affected [6]. Comparison of these different rates of prevalence is complicated because of differences in the conduct of the studies, and there is no routinely utilized gold standard clinical practice.

Individuals under the age of twenty have a higher frequency of acne compared to those over twenty-four years, and this finding was consistent with many previous studies [13, 14], which reported that acne occurrence declines after age 18, whereas milder forms tend to develop and persist into the early thirties. The prevalence of acne vulgaris in this age group reflects the biological hormonal changes, sebaceous gland activity, and their vulnerability to the psychosocial impact. Therefore, acne is significant both for public health planning and precise clinical management.

In this research, the male-to-female ratio was 1:1.5, suggesting a higher predisposition to acne among women. In contrast, males did not show a significant increase in the likelihood of developing acne compared to females. In the United States, the ratio was (1:2.5) while the ratio in Mosul was (1:2.14) [15, 16]. The current work observed no significant correlation between sex and acne severity. However, previous studies reported that male participants tended to have more severe acne, whereas females generally exhibited mild to moderate clinical forms [10, 17].

A major proportion (98.5%) of participants in this report had acne affecting the face, which is comparable to a study among young adults in South India, which revealed a slightly higher prevalence of 99.3% [18].

The potential correlation between food and acne development has been widely discussed; certain studies have reported a strong correlation between diet and acne, while others have found no such correlation [19]. This study demonstrated that consumption of spicy foods and cola was significantly associated with acne occurrence. A similar study conducted in Al-Kindy College of Medicine, University of Baghdad, showed that spicy and sweet food were more highly significant than other types of food [20]. Dietary factors may play a role in triggering or exacerbating acne in susceptible individuals. Significant association of spicy foods and cola with acne in this study may contribute to several indirect mechanisms such as increased body temperature, perspiration, and neurogenic in-

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Table 1. Distribution of acne vulgaris severity by different parameters in 270 students.

Variables		Total	Severity n (%)			P-value
			Mild	Moderate	Severe	
Sex	Male	106	58 (54.7)	42 (39.6)	6 (5.7)	0.837
	Female	164	84 (51.2)	69 (42.1)	11 (6.7)	
Foods	Spicy	110	45 (40.9)	56 (50.9)	9 (8.2)	0.006
	Sweets	204	101 (49.5)	88 (43.1)	15 (7.4)	0.148
	Cola	142	62 (43.7)	66 (46.4)	14 (9.9)	0.002
Body mass index	Under weight	34	18 (52.9)	14 (41.2)	2 (5.9)	0.994
	Normal weight	157	85 (54.1)	65 (41.4)	7 (4.5)	0.334
	Overweight	53	27 (51.0)	22 (41.5)	4 (7.5)	0.905
	Obese	26	12 (46.2)	10 (38.4)	4 (15.4)	0.132
Complications	Erythema	147	56 (38.1)	76 (51.7)	15 (10.2)	0.001
	Scaring	113	35 (31.0)	64 (56.6)	14 (12.4)	0.001
	Hyperpigmentation	101	37 (36.6)	56 (55.4)	8 (8.0)	0.001

Table 2. Distribution of severity of disease with scar grading of 270 students.

Severity	Scar grading						
	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Total	P-value
Mild	95 (67%)	32 (22.5%)	13 (9.1%)	2 (1.4%)	0 (0%)	142 (52.6%)	0.001
Moderate	38 (34.2%)	36 (32.4%)	33 (29.7%)	3 (2.7%)	1 (1.0%)	111 (41.1%)	0.001
Severe	4 (23.6%)	5 (29.4%)	4 (23.6%)	3 (17.6%)	1 (5.8%)	17 (6.3%)	0.608
Total	137 (50.74%)	73 (27.04%)	50 (18.52%)	8 (2.96%)	2 (0.74%)	270 (100%)	

flammation. Capsaicin, the active compound in chili peppers, can stimulate vasodilation and sweat gland activity, potentially leading to follicular occlusion and inflammatory lesions in predisposed individuals [21]. Although the evidence remains inconclusive, some studies reported a higher frequency of spicy food consumption among acne patients compared to controls, suggesting a possible aggravating role [22]. These findings support the need for individualized dietary counseling in acne management, particularly in populations with high intake of spicy or irritant foods.

The correlation between BMI and acne is controversial. There are several recognized mechanisms by which obesity affects the physiology of the skin. Androgen is derived from fat tissue. Peripheral hyperandrogenism, which raises sebaceous gland activity and is essential for the development of acne, was clearly influenced by obesity [23]. In the current study, about 59.6% of patients had a normal BMI, which shared a similar finding of a previous report that elucidated no causal relationship between BMI and acne vulgaris [24]. However, this relationship has been refuted by several previous studies. On the other hand, a Taiwanese research revealed a reverse tendency, showing that obese women had less acne than non-obese women [25]. An additional study found that adolescents with moderate/severe acne had significantly higher BMI z-scores than those with mild acne [26].

Around half of our patients presented with mild acne of different grades. This was in agreement with the findings of a published article in Thailand, where they found that mild acne occurred in 52% of the participants [27]. In the current study, 41.1% of cases had moderate acne and 6.3% had severe acne, consistent with proportions reported in previous research [28, 29]. The correlation between the acne grading system and severity levels is useful for both clinical and academic reporting. A Pearson chi-square test in a study confirmed significant agreement between the Global Acne Grading System and Investigator's Global Assessment (P-value = 0.001) [30], validating the use of numerical grading to represent severity categories, but not for predicting psychosocial impact. In this study, there was a significant difference (P-value = 0.001) between mild and moderate acne and between scar grading and severe acne, but no significant difference between severe acne and scar grading (P-value = 0.608). In contrast, Bernardis et al. found that higher grades were consistently associated with more severe acne [31].

This study has several limitations. The results apply mainly to medical students; the small sample size and the single institution may limit the generalizability of the study. In addition, the potential for recall and reporting bias. Besides, seven months may not capture seasonal variation in acne prevalence. Clinical assessment of acne severity lacks hormonal or biochemical profiles. This study is constrained by the multifactorial nature of acne pathogenesis, encompassing hormonal, microbial, genetic, and environmental influences which complicates the isolation of individual variables. Furthermore, the lack of stratification across acne subtypes (e.g., comedonal, inflammatory, cystic, and hormonal) may limit the generalizability.

CONCLUSION

Acne vulgaris is a prevalent condition among medical students in Anbar, predominantly affecting females and the face. Moderate and severe forms were more common in individuals under 20 years of age, while mild acne accounted for most cases. Dietary factors, such as consumption of spicy

foods and cola, showed significant associations with acne occurrence and highlight the significance of these lifestyle factors related to acne. Acne remains a condition with potential physical impacts, including scarring and hyperpigmentation. The results of this study align with global trends and provide a contribution from Iraqi setting despite limited dermatological research. These findings underscore the multifactorial nature of acne and highlight the necessity for awareness and targeted management strategies among young adults. Suggested future research in Arab countries should emphasize psychological assessment, hormonal, and biological profiles, and longitudinal approaches.

ETHICAL DECLARATIONS

Acknowledgments

We would like to thank all medical students who participated in the current study.

Ethics Approval and Consent to Participate

The present study was approved by the Ethical Approval Committee of the University of Anbar (Reference number 288 on September 26, 2024). Informed consent was obtained from all participants.

Consent for Publication

Not applicable (No personal information was published).

Availability of Data and Material

Data generated during this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that there is no conflict of interest.

Funding

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Use of Artificial Intelligence

Artificial intelligence has been used in a limited way to correct spelling, grammar, and punctuation, as well as in specific texts with editing.

Authors' Contributions

SYS and KTA contributed to the development of the project idea, assisted in interpreting the results and prepared and revised the manuscript. All authors made significant, direct, and intellectual contributions to the design, implementation, and writing of this study. The authors have read and approved the final version of the manuscript.

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