Original Article

Exploring the impact of nutrition and lifestyle in the pathogenesis of acne vulgaris

Raghad Alharbi[1], Zahra Alsindi[2], Enas Alhadi[3], Nafisah AlRadhwan[4], Wasan Aljahdali[5], Sami Alghamdi[6], Abdulrahman Alghamdi[6], Sarah Samargandi[7], Mohammed Abualqassim[8], Ahmed Baabdullah[9], Khames T. Alzahrani[10]

[1]College of Medicine, Umm Al-Qura University, Mecca, KSA. [2]College of Medicine, King Faisal University, Al-Ahsa, KSA. [3]General Physician, Najran University, Najran, KSA. [4]General Physician, Al-Khobar Health Network, Eastern Health Cluster, KSA. [5]Faculty of Medicine in Rabigh, King Abdulaziz University, Jeddah, KSA. [6]College of Medicine, Al Baha University, KSA. [7]College of Medicine, Alrayan Colleges, Madinah, KSA. [8]College of Medicine, Arabian Gulf University, Manama, Bahrain. [9]Dermatology Department, King Abdulaziz University, Jeddah, KSA. [10]Saudi Board of Endodontics, King Faisal Specialist Hospital & Research Centre, Riyadh, KSA.

ABSTRACT

Introduction: Acne vulgaris is a common chronic inflammatory skin condition that affects adolescents and young adults. Its development is influenced by hormonal, microbial, and environmental factors. Emerging research suggests that lifestyle and nutrition may significantly affect acne severity and prevalence, but there is limited evidence from the Saudi population.

Objectives: To determine the prevalence of acne vulgaris and evaluate associated dietary and lifestyle risk factors among individuals in Saudi Arabia.

Methods: A cross-sectional survey was conducted across Saudi Arabia between July and December 2024. Participants aged 18 and above with current or past acne vulgaris were recruited through social media platforms. A validated questionnaire assessed demographic data, lifestyle habits (hydration, sleep, physical activity, smoking), dietary patterns (fast food, dairy, chocolate), and acne history. Data were analyzed using SPSS version 21, with p-values ≤ 0.05 considered statistically significant.

Results: A total of 559 participants were included, with 65.3% females and 34.7% males. Overall, 45.6% of participants were aged 25 years or below. One-third consumed less than 1 liter of water daily, and 42.6% reported no physical activity. Acne onset commonly occurred between ages 11 and 20, with moderate severity being most prevalent. Statistically significant associations were found between acne treatment-seeking behavior and water intake, physical activity, and demographic variables.

Discussion: The findings support the role of modifiable lifestyle factors in acne pathogenesis. Hydration, exercise, and dietary habits may influence both development and management of acne vulgaris.

Conclusion: Lifestyle and dietary behaviors significantly impact acne vulgaris. Public health efforts and patient education targeting these factors may improve acne outcomes in the Saudi population.

Keyword: Acne vulgaris, Lifestyle, Diet, Saudi Arabia, Hydration

Introduction

Acne vulgaris is a long-lasting inflammatory chronic condition that affects the sebaceous unit. Commonly, normal circulating levels of dehydroepiandrosterone along with the bacterial species Cutibacterium acnes cause it to flare up throughout adolescence. Both inflammatory and non-inflammatory lesions may be present in this frequent skin condition [1].

Access this article online	
Quick Response Code:	Website: www.smh-j.com
	DOI: 10.54293/smhj.v6i1.178

Address for correspondence: Zahra Saleh Alsindi, Medical student, College of Medicine, King Faisal University, Al-Ahsa, KSA.
E-mail: Zahralsindi@gmail.com

Received: 26 Sept 2025 **Accepted:** 21 Oct 2025

Please cite this article as: Alsindi Z, Alharbi R, Alhadi E, AlRadhwan N, Aljahdali W, Alghamdi S, Alghamdi A, Samargandi S, Abualqassim M, Baabdullah A, Alzahrani K. Exploring the impact of nutrition and lifestyle in the pathogenesis of acne vulgaris. SMHJ [Internet]. 2025;6(1):1-16.

Acne vulgaris is a persistent inflammatory skin disorder [2]. Globally, acne vulgaris is a widely prevalent skin disorder affecting adolescents [3]. Many research studies have demonstrated that one of the major variables influencing the etiology of acne is diet [4]. Recent research carried out in Saudi Arabia demonstrated that among lifestyle aspects, eating fast food often was linked to an increase in acne prevalence (OR = 2.1; 95% confidence interval [CI] = 1.7–2.6). Suboptimal levels of physical activity on a weekly basis were also associated with a substantial risk (OR = 1.4; 95% CI = 1.1-1.8). Smoking emerged as a significant factor associated with acne, compared to non-smokers, smokers exhibited a higher rate of acne complaints (OR = 1.8; 95% CI = 1.4-2.3). Perceptions about stress and diet also had an impact. Assumption that psychological stress was identified as a significant predictor of greater odds of acne (OR = 2.0; 95% CI = 1.6-2.5), and similar results were reported for the assumption that nutrition influences acne development (OR = 1.7; 95% CI = 1.3-2.2) [5]. Similarly, a study conducted in Riyadh, revealed that there was a substantial correlation between stress and acne severity, with higher stress levels resulting in greater acne severity [6]. Another paper conducted in Egypt in 2024, showed a correlation between the incidence of acne vulgaris to having high BMI, yet did not establish a link between the weight and severity of the acne [7]. However, the literature showed conflicting results as it denied a similar correlation between acne severity and stress, depression, and anxiety disorder [8]. While acne is a common skin condition globally, there's a lack of well-documented data specific to the Saudi population. There might also be unique risk factors specific to Saudi Arabia’s climate, cultural practices, or sun exposure patterns. By addressing these gaps in knowledge, this study can guide healthcare professionals in developing effective treatment strategies and public health initiatives, targeted prevention, and inform educational campaigns to enhance public awareness.

Objective: The study aimed to assess the prevalence of acne vulgaris and identify associated lifestyle and dietary risk factors within the Saudi population.

Methods

Study Design and Timeline: The cross-sectional study has been conducted since July 2024 to December 2024 across the Kingdom of Saudi Arabia. To acquire individuals from around Saudi Arabia, A sample recruiting approach was rely on social media platforms (such As WhatsApp, Telegram, X, Facebook, etc).

Participants: The inclusion criteria for this study were as follows: adolescents and young adults 18 and above years old with acne vulgaris residing in Saudi Arabia and willing to participate. People aged below 18 years old, who haven't been diagnosed with acne vulgaris, residing outside of Saudi Arabia, or individuals who were unwilling to participate were excluded from this study.

Sample size: The sample size was established to guarantee minimum responses count required to provide a representative sample of the entire population. The sample size was calculated using Raosoft's sample size calculator. With an indicator percentage of 0.50, a margin of error of 5%, and a confidence interval (CI) of 95%. The determined sample size was 384.

Data Collection Instrument: A structured questionnaire was used as a study tool. This tool was applied in a relevant study conducted in Saudi Arabia [5]. The final version of the questionnaire consisted of 20 questions with 4 sections. Section 1 starts with a brief description of the study and the consent questions. Section 2 includes demographic features such as gender, marital status, age, residential area, educational qualifications, current job, and income. In Section 3, participants were asked about their lifestyle behaviors, such as water intake, chocolate and dietary consumption, and fast-food consumption, along with their sleep patterns, physical activity, and smoking habits. In Section 4, participants were questioned about their acne history, including the age of acne initiation, the intensity of acne, the body regions affected by acne, and the use of acne medication. If the response was "yes," they were asked about the type of medicine.

Pilot test: The questionnaire was distributed to 17 individuals, and they were instructed to complete it. This was done to test the questionnaire's clarity and feasibility of the study. The pilot research's data was not included in the final study results.

Ethical approval: KFU-REC-2025-MAY – ETHICS3454 from King Faisal University

Data Analysis

The data was entered into the device using "Microsoft Office Excel Software" for Windows (2021). The acquired data was then sent to the Statistical Package for Social Science Software (SPSS) tool, version 20 (IBM SPSS Statistics for Microsoft Windows, Version 21.0), for statistical analysis. Descriptive statistics were used to summarize the data. Associations between categorical variables were analyzed using the Chi-square test. A P-value < 0.05 was considered statistically significant.

Results

(Table 1) displays various demographic parameters of the participants, with a total sample size of 559. Age

group distribution also casts notice to a relatively young cohort of 45.6% who are < 25 and a notable 32.7% who are > 35, providing different perceptions and life stamps that reflect on these data. The gender imbalance of about 65.3% of females indicates the predominance of female participants in the study, which may influence the study's outputs and conclusions. Marital status reveals many singles (52.1%), with implications for the social dynamics of support systems in this community. The sample reflects high levels of education, as educational attainment is concentrated in those who have a bachelor's degree (49.6%). It is worrying that 22.4 % of them are unemployed, which might equate to the income data where more than half of the interviewed participants earn less than 5,000 Saudi riyals monthly, implying such a socioeconomic situation within the recorded structure of this population group. As shown in (Figure 1), analysis of the data from 559 respondents shows that it contains great insight into how much water people drink each day. Of note, 190 people, or about 34% of the sample, consume less than 1 liter of water every day. On the other hand, of these, a more adequate audience of 305 respondents, roughly 55%, claimed their average daily water intake is within the range of 1 to 2 liters. While, only 64 participants, about 11%, said they consume more than 2 liters of water per day. This distribution is a worrisome one, as such a large swath of the sample seems to be falling short of what are thought to be standard hydration targets. Based on the data shown in (Table 2), a summary of lifestyle parameters of 559 participants shows significantly interesting information on their daily habits and their health-related behaviours. Of note, most respondents (54.6%) reported to average consumed water quantity of 1-2 liters per day, which agrees with general recommendations of hydration, although 34.0% of respondents consume less than 1 liter. Sleep patterns showed that over half (56.5%) of participants slept 5-7 hours per night, a likely suboptimal amount of sleep for multiple health outcomes. It was additionally found that fast food consumption frequency indicated a common dietary issue, with consuming it weekly by 40.4% of respondents. A substantial majority (84.3%) do not smoke, but their exercise habits show that 42.6% don't do any physical activity, signalling a good context to intervene in their health. As shown in (Figure 2), the age of first acne experience data for 559 sample participants reveals interesting insights about the age of first acne appearance of this common dermatological condition. The most prevalent was between the ages of 11 to 15, as a whopping 28.5 percent, or 159 people, said it was the age at which they first noticed acne. In addition, respondents aged 16 to 20 comprised 32.5% or 182 respondents, indicating that acne incidence peaks during adolescence. On the other hand, groups comprised smaller percentages of 9.7% (54 participants) and 3.6% (20 participants), respectively, both decreased in number, indicating fewer new cases among older age brackets. Moreover, 17.9% of respondents, consisting of 100 people, reported never knowing a thing about acne in life. The data in (Table 3) summarize the 559 participants, including severity and treatment-seeking behavior for acne. Among the 78 participants, most (32.6%) stated that they first experienced acne at the age of 16 to 20, which may indicate a relationship with hormonal changes during adolescence. The vast majority (40.8%) of cases were moderate, while a smaller proportion (29.7%) were mild, and 13.4% had severe cases. It seemed that most people, 68.7%, had facial acne, which means that the area of the face is the most affected by that. Surprisingly, 68.9 percent of participants received medical treatment, and, in the majority (55.3 percent), it was in the form of topical therapy. (Table 4) shows that the rate of exercise has statistically significant relation to age (P = 0.002), residential region (P = 0.0001), and educational level (P = 0.002). No statistically significant associations were found between this variable and gender, marital status, employment status, or monthly income. Participants aged 35 or more and residing in western region were found less active. (Table 5) shows that rate of chocolate consumption has statistically significant relation to gender (P = 0.021), age (P = 0.002), and educational level (P = 0.012). It also shows statistically insignificant relation to marital status, residential region, occupational status, and monthly income. Participants aged 35 or more and of male gender were found consuming less chocolate than others. (Table 6) shows that seeking medical treatment for acne has statistically significant relation to rate of daily water intake (P = 0.006), rate of exercise (P = 0.0001), gender (P = 0.0001), marital status (P = 0.006), age (P = 0.034), and monthly income (P = 0.030). Participants with daily water intake less than 1 liter, exercising 3 to 4 times a week, single, and aged 26 to 34 were found mostly to be seeking medical treatment for acne.

Discussion

Consequently, the principal goal of the present study was to investigate the effects of nutrition and lifestyle on the pathogenesis of acne vulgaris in the Saudi

Table 1: Sociodemographic characteristics of participants (n=559).

Parameter		No.	Percent (%)
Age (Mean: 31.3, Standard Deviation: 11.6)	21 or less	110	19.7
	22 to 25	145	25.9
	26 to 34	121	21.6
	35 or more	183	32.7
Gender	Female	365	65.3
	Male	194	34.7
Marital status	Single	291	52.1
	Married	226	40.4
	Divorced	30	5.4
	Widowed	12	2.1
Residential region	Northern region	15	2.7
	Southern region	190	34.0
	Central region	63	11.3
	Eastern region	97	17.4
	Western region	194	34.7
Educational level	Primary school	5	0.9
	Middle school	25	4.5
	High school	133	23.8
	Diploma	72	12.9
	College student	9	1.6
	Bachelor's	277	49.6
	Postgraduate studies	33	5.9
	I don't have educational qualification	5	0.9
Employment status	Student	162	29.0
	Healthcare sector employee	63	11.3
	Non-healthcare sector employee	144	25.8
	Freelancer	31	5.5
	Unemployed	125	22.4
	Retired	34	6.1
Monthly income	Less than 1000 Saudi riyal	182	32.6
	1000 – 5000	125	22.4
	5001 – 10000	101	18.1
	10001 – 15000	82	14.7
	More than 15000 Saudi riyal	69	12.3

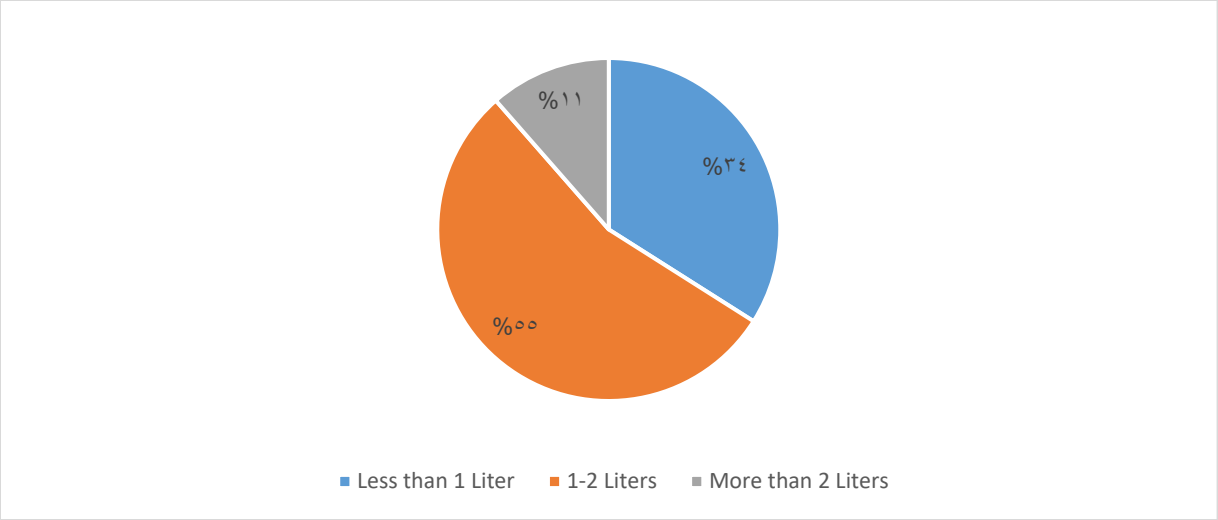

Figure 1: Illustrates daily water intake among participants.

Table 2: Parameters related to lifestyle of the participants (n=559).

Parameter		No.	Percent (%)
How would you rate your daily water intake?	Less than 1 Liter	190	34.0
	1-2 Liters	305	54.6
	More than 2 Liters	64	11.4
How many hours do you sleep on average per night?	Less than 5 hours	48	8.6
	5-7 hours	316	56.5
	8-10 hours	155	27.7
	More than 10 hours	40	7.2
How frequently do you consume fast food?	Daily	77	13.8
	Weekly	226	40.4
	Monthly	143	25.6
	Rarely	113	20.2
Do you smoke?	No	471	84.3
	Yes	88	15.7
How often do you exercise per week?	I don’t exercise	238	42.6
	1-2 times per week	170	30.4

	3-4 times per week	106	19.0
	More than 4 times a week	45	8.1
How frequently do you consume chocolate?	Never	63	11.3
	1-2 times per week	287	51.3
	3-4 times per week	147	26.3
	Every day	62	11.1
How frequently do you consume dairy products?	Never	30	5.4
	1-2 times per week	219	39.2
	3-4 times per week	174	31.1
	Every day	136	24.3

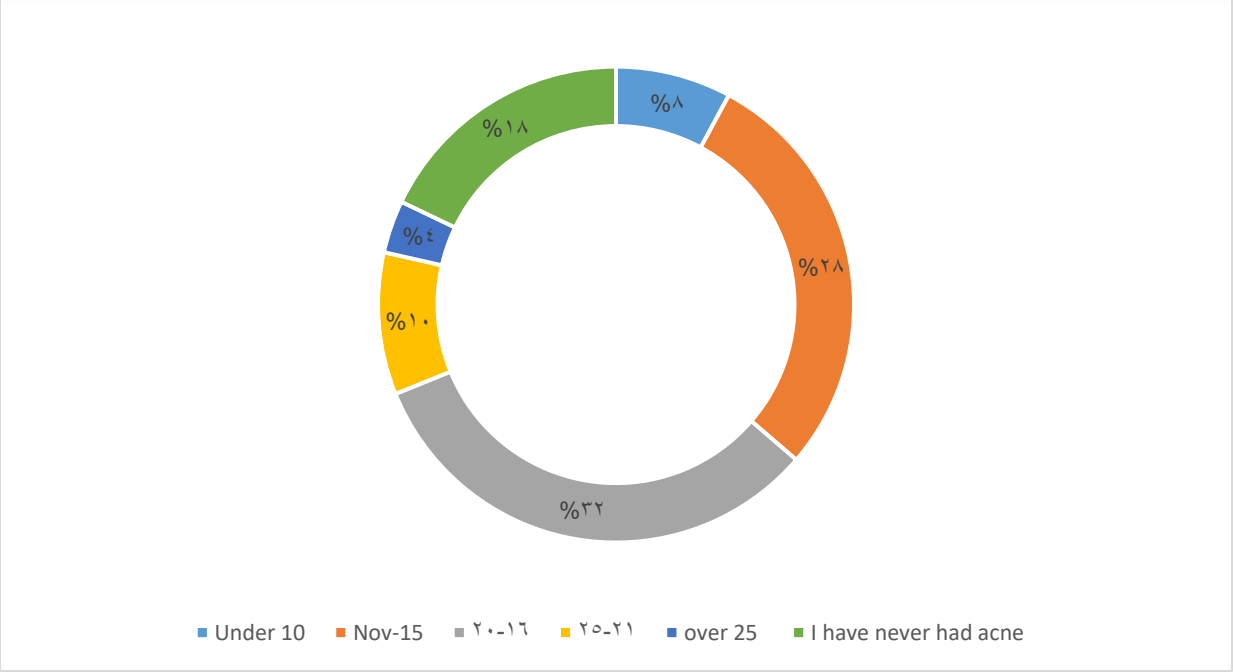

Figure 2: Illustrates age of first experiencing acne among participants.

Table 3: Participants' acne history (n=559).

Parameter		No.	Percent (%)
At what age did you first experience acne?	Under 10	44	7.9
	11-15	159	28.4
	16-20	182	32.6
	21-25	54	9.7
	over 25	20	3.6
	I have never had acne	100	17.9
How would you describe the severity of your acne at it is worst?	Mild	166	29.7
	Moderate	228	40.8
	Severe	75	13.4
	I have never had acne	90	16.1
What areas of your body are affected by acne?	Face	384	68.7
	Back	205	36.7
	Chest	١١٧	20.9
	Shoulders	105	18.8
	Others	4	0.7
	None	91	16.3
Have you ever sought medical treatment for acne?	No	174	31.1
	Yes	385	68.9
If yes, what type of treatment did you use? (n=385)	Topical treatment	213	55.3
	Oral medications	128	33.2
	Dietary changes	83	21.6
	Laser or light therapy	31	8.1
	Other	79	20.5

Table 4: Relation between rate of exercise and sociodemographic characteristics.

Parameters		Rate of exercise		Total (N=559)	P value*
		I don't exercise	Sometimes or frequent		
Gender	Female	156	209	365	0.914
		65.5%	65.1%	65.3%	
	Male	82	112	194	
		34.5%	34.9%	34.7%	
Marital status	Single	132	159	291	0.057
		55.5%	49.5%	52.1%	
	Married	94	132	226	
		39.5%	41.1%	40.4%	
	Divorced	6	24	30	
		2.5%	7.5%	5.4%	
	Widowed	6	6	12	
		2.5%	1.9%	2.1%	
Age	21 or less	53	57	110	0.002
		22.3%	17.8%	19.7%	
	22 to 25	61	84	145	
		25.6%	26.2%	25.9%	
	26 to 34	34	87	121	
		14.3%	27.1%	21.6%	
	35 or more	90	93	183	
		37.8%	29.0%	32.7%	
Residential region	Northern region	4	11	15	0.0001
		1.7%	3.4%	2.7%	
	Southern region	92	98	190	
		38.7%	30.5%	34.0%	
	Central region	23	40	63	
		9.7%	12.5%	11.3%	
	Eastern region	24	73	97	
		10.1%	22.7%	17.4%	
	Western region	95	99	194	
		39.9%	30.8%	34.7%	
Educational level	Primary school	0	5	5	0.002
		0.0%	1.6%	0.9%	
	Middle school	3	22	25	

		1.3%	6.9%	4.5%	
	High school	66	67	133	
		27.7%	20.9%	23.8%	
	Diploma	28	44	72	
		11.8%	13.7%	12.9%	
	College student	4	5	9	
		1.7%	1.6%	1.6%	
	Bachelor's degree	127	150	277	
		53.4%	46.7%	49.6%	
	Postgraduate degree	8	25	33	
		3.4%	7.8%	5.9%	
	Uneducated	2	3	5	
		0.8%	0.9%	0.9%	
Occupational status	Student	79	83	162	0.235
		33.2%	25.9%	29.0%	
	Health-sector employee	20	43	63	
		8.4%	13.4%	11.3%	
	Non-health-care sector employee	58	86	144	
		24.4%	26.8%	25.8%	
	Unemployed	54	71	125	
		22.7%	22.1%	22.4%	
	Freelancer	11	20	31	
		4.6%	6.2%	5.5%	
	Retired	16	18	34	
		6.7%	5.6%	6.1%	
Monthly income	Less than 1000 Saudi riyal	88	94	182	0.184
		37.0%	29.3%	32.6%	
	1000 – 5000	55	70	125	
		23.1%	21.8%	22.4%	
	5001 – 10000	41	60	101	
		17.2%	18.7%	18.1%	
	10001 – 15000	27	55	82	
		11.3%	17.1%	14.7%	
	More than 15000 Saudi riyal	27	42	69	
		11.3%	13.1%	12.3%	

*P value was considered significant if ≤ 0.05.

Table 5: Consumption of chocolate in association with sociodemographic characteristics.

Parameters		Consumption of chocolate		Total (N=559)	P value*
		Never or rarely	Often or daily		
Gender	Female	216	149	365	٠,٠٢١
		61.7%	71.3%	65.3%	
	Male	134	60	194	
		38.3%	28.7%	34.7%	
Marital status	Single	181	110	291	٠,٠٦١
		51.7%	52.6%	52.1%	
	Married	146	80	226	
		41.7%	38.3%	40.4%	
	Divorced	13	17	30	
		3.7%	8.1%	5.4%	
	Widowed	10	2	12	
		2.9%	1.0%	2.1%	
Age	21 or less	56	54	110	٠,٠٠٢
		16.0%	25.8%	19.7%	
	22 to 25	96	49	145	
		27.4%	23.4%	25.9%	
	26 to 34	68	53	121	
		19.4%	25.4%	21.6%	
	35 or more	130	53	183	
		37.1%	25.4%	32.7%	
Residential region	Northern Region	11	4	15	٠,٤٣١
		3.1%	1.9%	2.7%	
	Southern Region	121	69	190	
		34.6%	33.0%	34.0%	
	Central Region	44	19	63	
		12.6%	9.1%	11.3%	
	Eastern Region	61	36	97	
		17.4%	17.2%	17.4%	
	Western Region	113	81	194	
		32.3%	38.8%	34.7%	
Educational level	Primary school	3	2	5	٠,٠١٢
		0.9%	1.0%	0.9%	

	Middle school	18	7	25	
		5.1%	3.3%	4.5%	
	High school	74	59	133	
		21.1%	28.2%	23.8%	
	Diploma	49	23	72	
		14.0%	11.0%	12.9%	
	College student	1	8	9	
		0.3%	3.8%	1.6%	
	Bachelor's degree	176	101	277	
		50.3%	48.3%	49.6%	
	Postgraduate degree	25	8	33	
		7.1%	3.8%	5.9%	
	Uneducated	4	1	5	
		1.1%	0.5%	0.9%	
Occupational status	Student	91	71	162	٠,٠٩٥
		26.0%	34.0%	29.0%	
	Health-sector employee	38	25	63	
		10.9%	12.0%	11.3%	
	Non-health-care sector employee	94	50	144	
		26.9%	23.9%	25.8%	
	Unemployed	77	48	125	
		22.0%	23.0%	22.4%	
	Freelancer	23	8	31	
		6.6%	3.8%	5.5%	
	Retired	27	7	34	
		7.7%	3.3%	6.1%	
Monthly income	Less than 1000 Saudi riyal	110	72	182	٠,٦٥٣
		31.4%	34.4%	32.6%	
	1000 – 5000	77	48	125	
		22.0%	23.0%	22.4%	
	5001 – 10000	66	35	101	
		18.9%	16.7%	18.1%	
	10001 – 15000	49	33	82	
		14.0%	15.8%	14.7%	
	More than 15000 Saudi riyal	48	21	69	
		13.7%	10.0%	12.3%	

**P value was considered significant if ≤ 0.05.*

Table 6: Seeking medical treatment for acne in association with sociodemographic characteristics, lifestyle and nutrition.

Parameters		Have you ever sought medical treatment for acne?		Total (N=559)	P value*
		No	**Yes**		
How would you rate your daily water intake?	Less than 1 Liter	53	137	190	0.006
		30.5%	35.6%	34.0%	
	1-2 Liters	110	195	305	
		63.2%	50.6%	54.6%	
	More than 2 Liters	11	53	64	
		6.3%	13.8%	11.4%	
How many hours do you sleep on average per night?	Less than 5 hours	9	39	48	0.214
		5.2%	10.1%	8.6%	
	5-7 hours	106	210	316	
		60.9%	54.5%	56.5%	
	8-10 hours	46	109	155	
		26.4%	28.3%	27.7%	
	More than 10 hours	13	27	40	
		7.5%	7.0%	7.2%	
How frequently do you consume fast food?	Daily	25	52	77	0.133
		14.4%	13.5%	13.8%	
	Weekly	80	146	226	
		46.0%	37.9%	40.4%	
	Monthly	34	109	143	
		19.5%	28.3%	25.6%	
	Rarely	35	78	113	
		20.1%	20.3%	20.2%	
Do you smoke?	No	144	327	471	0.513
		82.8%	84.9%	84.3%	
	Yes	30	58	88	
		17.2%	15.1%	15.7%	
	I don’t exercise	94	144	238	0.0001

How often do you exercise per week?		54.0%	37.4%	42.6%	
	1-2 times per week	51	119	170	
		29.3%	30.9%	30.4%	
	3-4 times per week	19	87	106	
		10.9%	22.6%	19.0%	
	More than 4 times a week	10	35	45	
		5.7%	9.1%	8.1%	
How frequently do you consume chocolate?	Never	20	43	63	0.468
		11.5%	11.2%	11.3%	
	1-2 times per week	97	190	287	
		55.7%	49.4%	51.3%	
	3-4 times per week	39	108	147	
		22.4%	28.1%	26.3%	
	Every day	18	44	62	
		10.3%	11.4%	11.1%	
How frequently do you consume dairy products?	Never	7	23	30	0.788
		4.0%	6.0%	5.4%	
	1-2 times per week	70	149	219	
		40.2%	38.7%	39.2%	
	3-4 times per week	53	121	174	
		30.5%	31.4%	31.1%	
	Every day	44	92	136	
		25.3%	23.9%	24.3%	
Gender	Female	94	271	365	0.0001
		54.0%	70.4%	65.3%	
	Male	80	114	194	
		46.0%	29.6%	34.7%	
Marital status	Single	108	183	291	0.006
		62.1%	47.5%	52.1%	
	Married	58	168	226	
		33.3%	43.6%	40.4%	
	Divorced	4	26	30	
		2.3%	6.8%	5.4%	
	Widowed	4	8	12	
		2.3%	2.1%	2.1%	
Age	21 or less	39	71	110	0.034
		22.4%	18.4%	19.7%	
	22 to 25	52	93	145	

		29.9%	24.2%	25.9%	
	26 to 34	25	96	121	
		14.4%	24.9%	21.6%	
	35 or more	58	125	183	
		33.3%	32.5%	32.7%	
Residential region	Northern Region	6	9	15	0.099
		3.4%	2.3%	2.7%	
	Southern Region	58	132	190	
		33.3%	34.3%	34.0%	
	Central Region	20	43	63	
		11.5%	11.2%	11.3%	
	Eastern Region	20	77	97	
		11.5%	20.0%	17.4%	
	Western Region	70	124	194	
		40.2%	32.2%	34.7%	
Educational level	Primary school	0	5	5	0.107
		0.0%	1.3%	0.9%	
	Middle school	2	23	25	
		1.1%	6.0%	4.5%	
	High school	47	86	133	
		27.0%	22.3%	23.8%	
	Diploma	25	47	72	
		14.4%	12.2%	12.9%	
	College student	4	5	9	
		2.3%	1.3%	1.6%	
	Bachelor’s degree	87	190	277	
		50.0%	49.4%	49.6%	
	Postgraduate degree	8	25	33	
		4.6%	6.5%	5.9%	
	Uneducated	1	4	5	
		0.6%	1.0%	0.9%	
Occupational status	Student	57	105	162	0.329
		32.8%	27.3%	29.0%	
	Health-sector employee	15	48	63	
		8.6%	12.5%	11.3%	
	Non-health-care sector employee	46	98	144	
		26.4%	25.5%	25.8%	
	Unemployed	34	91	125	

		19.5%	23.6%	22.4%	
	Freelancer	8	23	31	
		4.6%	6.0%	5.5%	
	Retired	14	20	34	
		8.0%	5.2%	6.1%	
Monthly income	Less than 1000 Saudi riyal	59	123	182	0.030
		33.9%	31.9%	32.6%	
	1000 – 5000	38	87	125	
		21.8%	22.6%	22.4%	
	5001 – 10000	36	65	101	
		20.7%	16.9%	18.1%	
	10001 – 15000	14	68	82	
		8.0%	17.7%	14.7%	
	More than 15000 Saudi riyal	27	42	69	
		15.5%	10.9%	12.3%	

*P value was considered significant if ≤ 0.05.

population. The cause is multiple factors such as hormone changes, genetic traits, and environmental substances. We found that many participants reported insufficient hydration, with 34% drinking less than 1 liter of water per day. This is the same as previous studies that have linked hydration levels to healthy skin. For example, a study showed that lower facial skin hydration is strongly related to greater severity of acne vulgaris, indicating a central location of hydration in skin integrity and possibly in reducing the severity of acne [9]. Additionally, we observed a strongly correlated relationship between drinking water daily and the probability of seeking medical treatment for acne (P=0.006), confirming that hydration most likely affects acne management [5]. Our participants consumed a lot of fast food and high-glycemic-index foods. Nearly 40.4 percent said they eat fast food weekly, a rate backed by other studies that have found that fast food increases the severity of acne lesions. For example, individuals eating a clone from a Western diet, high in junk food, had worse acne than others [10]. Like this, along with Malaysian young adults, a diet enhanced with glycemic load, as well as consumption of dairy products such as milk and ice cream, were also found to be correlated to acne vulgaris [11]. Together, these findings indicate that dietary patterns high in processed foods and sugars may promote insulin resistance and thereby the pathogenesis of acne by elevating the concentrations of insulin-like growth factor-1 (IGF-1), a known accelerator of sebaceous gland activity [11]. Surprisingly enough, our study showed that chocolate consumption also had a significant effect depending on gender, age, and educational status (P=0.021; P=0.002; P=0.012). This result supports that of a previous study that found that 31.4 percent of participants saw their acne severity increase after eating chocolate [12]. However, hormonal changes in adolescence, specifically in women, may stimulate the development of acne in conjunction with dietary components such as chocolate. This implies that dietary modifications, especially in young adult patients, are a reasonable method of management of acne vulgaris. Also, our analysis showed that lifestyle factors, including physical activity levels, correlated with the severity of acne. Participants who regularly exercised were less likely to see a physician for acne (P=0.0001). This is consistent with a range of literature emphasizing that physical activity might help in general skin health by promoting circulation and decreasing stress [13], a cause of acne. However, a large portion of our participants (42.6%) did not engage in any physical activity, and thus this represents an area that could potentially be addressed by public health interventions supporting an increase in physical activity associated with decreased severity

of acne. The present study must also recognize the limitations. However, relying on self-reported data can be a source of bias: the participant may report less than it is or vice versa. Furthermore, the study is cross-sectional, such that causal relationships cannot be established between the risk factors identified and acne vulgaris. Further exploration of these associations in future longitudinal studies is warranted, and future studies are necessary to assess the long-term effects of dietary and lifestyle manipulations on acne outcomes.

Conclusion

This study demonstrates the significant role of hydration, dietary patterns, and lifestyle behaviors in the pathogenesis and management of acne vulgaris within the Saudi Arabian population. Key modifiable factors, such as, low water intake, poor sleep, and limited physical activity, were found to be associated with acne severity and treatment-seeking behavior. However, limitations within the study must be acknowledged, including its reliance on self-reported data and the cross-sectional design, which restricts the ability to draw causal inference. In subsequent longitudinal and interventional studies, it is recommended to further investigate these relationships and evaluate the effectiveness of lifestyle modifications in acne prevention and treatment.

Conflict of Interest

None

Funding

None

References

1. Paul Jarrett. Acne vulgaris. In: Encyclopedia of Pharmacy Practice and Clinical Pharmacy [Internet]. 1st edition. Amsterdam: Elsevier; 2019. p. V3A-699-V3A-712. Available from: https://books.google.com/books?id=rv2BDwAAQBAJ

2. Manchanda Y, Das S, Sarda A, Biswas P. Controversies in the Management of Cutaneous Adverse Drug Reactions. Indian J Dermatol. 2018;63(2):125–30.

3. Lynn DD, Umari T, Dunnick CA, Dellavalle RP. The epidemiology of acne vulgaris in late adolescence. Adolesc Health Med Ther. 2016;7:13–25.

4. Conforti C, Agozzino M, Emendato G, Fai A, Fichera F, Marangi GF, et al. Acne and diet: a review. Int J Dermatology. 2022 Aug;61(8):930–4.

5. Khormi G, Aldubayyan N, Hakami M, Daghriri S, Aqeel S. Impact of Lifestyle and Dietary Habits on the Prevalence of Acne Vulgaris: A Cross-Sectional Study From Saudi Arabia. Cureus [Internet]. 2024 Mar 29 [cited 2025 Oct 7]; 16(3):e57200. Available from: https://www.cureus.com/articles/244020-impact-of-lifestyle-and-dietary-habits-on-the-prevalence-of-acne-vulgaris-a-cross-sectional-study-from-saudi-arabia

6. Alloboon FM, Elsaid T, Alzakry LM, Alrefai AM, Kofi M. Psychological Stress among Acne Vulgaris Patients in PHCs, Riyadh, Saudi Arabia. Act Scie Medic. 2024 Feb 1;12:33–43.

7. Ali EM, Saleh AAEW, El Sayed RAEH, Nazmy NN. Relation Between Acne and Different Body Weight. Benha Journal of Applied Sciences. 2024 Jan 27;9(1):61–5.

8. Karaağaç M, Akça HM, Acat Ö. Lack of Association of Acne Severity with Depression, Anxiety, Stress, and Eating Attitudes: A Cross-Sectional Study. JPM. 2024 Jan 23;14(2):133.

9. Yolanda MO, Jusuf NK, Putra IB. Lower facial skin hydration level increases acne vulgaris severity level. Bali Med J. 2021 Dec 30;10(3):1081–4.

10. Bajelan A, Ghaebi M, Javadi M, Barikani A, Beheshti A, Bargahi M, et al. The Association Between the Incidence of Acne Vulgaris and Lifestyle Factors Including Dietary Habits, Physical Activity, and Bathing Frequency. J Skin Stem Cell [Internet]. 2021 Apr 6 [cited 2025 Oct 7];7(3): e114161. Available from: https://brieflands.com/articles/jssc-114161

11. Ismail NH, Manaf ZA, Azizan NZ. High glycemic load diet, milk and ice cream consumption are related to acne vulgaris in Malaysian young adults: a case control study. BMC Dermatol. 2012 Dec;12(1):13.

12. Alenezy DA, Alshammari MRM, Alanazi ANF, Alshammari NNZ, Alrawaili SDK. Acne Vulgaris among Adolescent Females in Arar City, Northern Saudi Arabia. Pharmacophore. 2022;13(1):100–7.

13. Al Hussein SM, Al Hussein H, Vari CE, Todoran N, Al Hussein H, Ciurba A, et al. Diet, Smoking and Family History as Potential Risk Factors in Acne Vulgaris – a Community-Based Study. Acta Medica Marisiensis. 2016 June 1;62(2):173–81.