

Acne among Medical Students in Baghdad, Pattern and Associated Factors

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ABSTRACT

Background: Acne is very common in teenagers and younger adult age groups characterized by chronic inflammation of pilosebaceous glands. It is the most common skin disease, affecting nearly 80 percent of persons at some time between the ages of 11 and 30 years. The majority of medical students are adolescents who are the most sufferers of acne and the ones suffering from emotional and social stress.

Method: A cross-sectional study of analytic element was conducted on a convenient sample of medical students from six medical colleges in Baghdad. Questionnaires covering the demography, clinical acne pattern, treatment modality and psychological relation were designed and distributed online to the students and the results were analyzed by SPSS and presented by suitable charts and tables, association was assessed by chi square test.

Result: A cross-sectional study included 768 students of medical colleges in Baghdad, age range 17-27 years with mean \pm SD (20.4 \pm 1.8) The study shows that the most common types of acne are whiteheads (38.67%) & papule (36.71%) but cysts, papule, and pustules are associated with the highest rate of complications. It's mostly distributed on the face (90.75%). On the subject of acne severity, most cases are almost clear (42%) followed by mild and moderate (34%, 20%). Regarding the effect of skin type on the appearance of acne, this study revealed that normal/combined skin type has the highest association of acne appearance (50%) but the oily skin has the highest severity (5.2%) and the highest rate of complications (72.6%) if compared with other types of skin. It shows that females have more complications associated with acne than males.

Conclusion: Females are at higher percentage to get acne, especially those who have oily skin. Whiteheads are the most common types, the common sites on face and chest, about quarter of the students have moderate-severe acne, certain types of food (as dairy and high carb), stress, were among factors having significant association with acne complications (74%, 47% respectively), face washing as treatment showed improvement of acne.

Keywords

Acne, Pattern, Medical students.

Introduction

Acne is a common and widely distributed dermatological condition that affects most people, main manifestation is papules, and erythematous painful skin lesion, in face, chest, back, shoulders and neck [1].

The clinical picture includes many lesion types as papules, cystic lesions, pustular lesions black heads (open comedons), whiteheads (closed comedons), also nodular lesions and scarring [2].

Acne is very common in teenagers and younger adult age groups characterized by chronic inflammation of pilosebaceous glands [3]. Acne vulgaris is the most common skin disease, affecting nearly 9.4% of the population, but mostly in adolescence [4-7].

Acne represents the top three most prevalent skin conditions regardless of socioeconomic status, nationality, or sex., acne vulgaris in late adolescence represents itself as a global issue, its pathogenesis is composed of sebaceous hyperplasia, many causes are implicated of acne vulgaris as the genetic, hormones, infectious, certain types of diet, smoking, medications, and psychological stress [8,9].

The disfigurement in appearance can produce psychological problems may affect the self-esteem at a of adolescence life. When the acne disfigurement is severe, it will be associated with increased anxiety and depression that may trigger thoughts of suicide [10,11]. Female reports acne more than male, and increases during adolescence because of hormonal changes thus in girls, it may accentuate during premenstrual period [12].

During the COVID pandemic and the necessity of mask wearing as a preventive measure, the prolonged time of wearing mask lead to flare up of acne among mask users due to the facilitation of infection caused by friction and sweatin [13,14].

Acne patients who had a clear complexion were greatest during the summer and fall. Winter, on the other hand, tended to be a rough season; rates of moderate-to-severe acne leaped 11% among study participants in winter compared to summer [15]. It's common to link oily skin to acne. After all, excess oil is a known contributor Trusted Source to breakouts. But dry skin types can still experience acne for a number of reasons, whether it's due to environmental factors or a poor skincare routine that irritates the skin and clogs pores [15].

The majority of medical students are adolescents who are the most sufferers of acne and also the ones suffering from emotional and social stress. Self-medication is a fairly common practice among medical students due to a variety of factors such as ease of availability, exposure to medical settings, and pharmacological knowledge [16]. The theoretical knowledge about acne among medical students is relatively limited before they start their clinical training [17].

Objectives

- To describe the pattern of acne among medical students.
- To determine the clinical types, aggravating factors, different modes of treatment, and the complications of acne on the medical students.
- To assess the association between complications and severity with Different variables.

Methodology

A cross-sectional study with analytic element was conducted on a convenient sample of medical students from six medical colleges in Baghdad (Baghdad, Al-Nahrain, Al-Mustansiriyah, Al-Kindy, Al-Iraqia, and Ibn Sina College of Medicine), during a period of 3 months, in 2022.

Data collection was done through an online-distributed questionnaire composed of 10 drop list questions, 8 checkbox questions, and 3 short answer questions. The questions covered three parameters: demographic parameters (age, gender), clinical parameter (type of acne, severity, aggravating factors, habits that affect the acne, complications, different modes of treatment), plus the emotional parameter (difficulties being faced by the acne sufferer at the time of this disease).

The questionnaire was designed in both Arabic and English languages to allow the students to fully understand the questions as early stage medical students may not be fully knowledgeable about the medical terms of acne.

Definition of variables (18).

•Complication of acne: skin pigments, scars, peel off the skin, painful inflammatory reactions.

•Acne grading:

•Mild:

<20 comedones

<15 inflammatory lesions

Or total lesions count<30

•Moderate acne:

20-100 comedones

15-20 inflammatory lesions

Or total lesions count 30-125

•Severe acne

>5 pseudocyst.

Total comedon count >100

Total inflammatory count>50

Or total lesions count>125

Skin lesions:

•Closed comedones or whiteheads are small plugged follicles, the contents of which are not exposed to the skin.

•Open comedones or blackheads are small follicles with dilated openings to the skin allowing oxidation of the debris within the follicle leading to the black color.

•Papules: red lesions and/or tender bumps.

•Pustules: lesions filled with purulent material forming pus bumps

•Nodules: lesions progress to become larger and more tender.

•Cysts: are deep, fluid-filled lesions.

•Skin types:

•Oily skin: skin appears shiny throughout.\

•Dry skin: feels tight and is flaky or scaly

•Combination skin: shine is only in T-zone (the T-shaped area of a person's face that includes the forehead, nose, and chin).

•Normal skin: skin feels hydrated and comfortable, but not oily.

Data analysis by SPSS, Version 28, quantitative data was presented in mean and standard deviation, qualitative data was presented in counts and percentage, suitable table s and graphs were constructed, Chi-Square test used to test the association. The level $P \leq 0.05$ was considered significant.

Results

Sample included 768 students of medical colleges in Baghdad, age range 17-27 years with mean \pm SD (20.4 \pm 1.8). Males were 202 while females were 566. Table (3-1) showed that the appearance of acne was higher at age less than 20 years if compared to other age groups:

Table 1: Acne distribution among participants according to age.

Age	Acne distribution
≤ 20	55.98%
21-23	40.10%
≥ 24	3.90%
mean \pm SD (20.4 \pm 1.8).	

Table 2: Distribution of acne by gender and percentage of complication.

sex	Complications	No complications	Total
Male	98(47%)	104(43%)	202
Female	419(74%)	147(26%)	566
Total			768

The above table shows that females have higher complications percentage (419,74%), in comparison to males (98,47%), Regarding the type of acne, the study showed that there was a comparable percent of blackheads, white head, pustules, and papule (33.46%, 38.67%, 36.45%, and 36.71% respectively), while other types (cyst and nodule) was less (26.30% and 17.44%), as shown in figure (1).

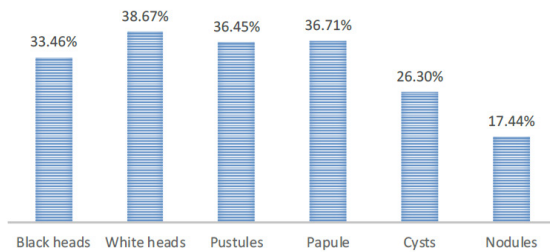


Figure (3-1): Type of acne

Figure 1: Type of acne Concerning the site of acne. (More than one option were selected).

Figure 2 revealed that the most prevalent site was the face (90.75%) which was followed by the back (42.7%) and the shoulder (31.25%), while the least site was the chest (19.27%) and the neck (7.9%).

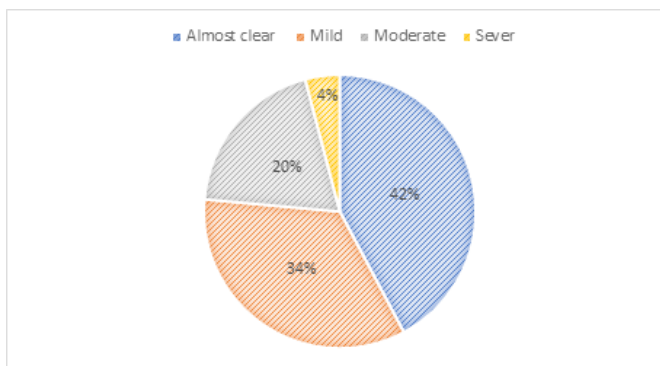


Figure 2: Site of acne.

On the subject of acne severity, most cases were almost clear (42%) followed by mild and moderate (34%, 20%), while very few cases were severe (4%), as shown in figure (3-3).

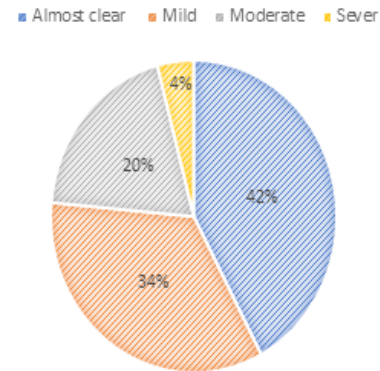


Figure 3: Severity of acne.

This study showed in figure (3-4) that 55% of cases took treatment while 45% did not and recovered spontaneously.

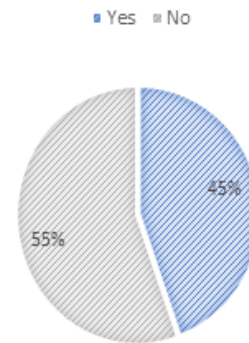


Figure 4: The treated form of acne.

With the respect to the complication of acne, the study revealed that the most prevalent complication was pigmented (30%) which was followed by no complication and scar (24%, 21%) while peeling off the skin and the painful inflammatory reaction was the least (15%, 10%), as shown in figure (3-5).

acne complication

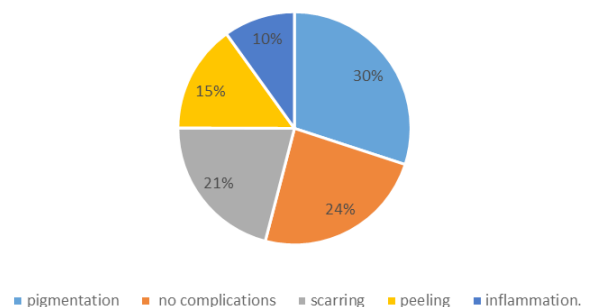


Figure 5: Complication of Acne.

Regarding the effect of skin type on the appearance of acne, this study revealed that oily skin type has the highest association of acne appearance (50%,433), the combined skin type has (364,42%) of acne association, while the dry skin has the least association with acne appearance,(69,8%), as shown in figure (6).

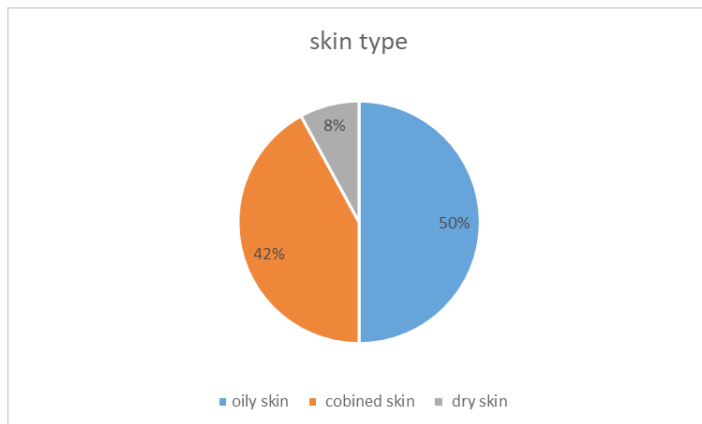


Figure 6: The distribution of acne according to skin type.

This table 2 illustrate a different type of acne and its relation to complication, where blackheads, pustules, papule, and cyst types of acne significantly has a complication, while whiteheads and nodules do not show significant complication:

Table 2: Association of complications with different types of acne.

Type of acne		Complications				Total		P. Value
		N	%	N	%	N	%	
Black heads	Yes	187	72.8	70	27.2	257	100.0	0.043
	No	335	65.6	176	34.4	511	100.0	
White heads	Yes	206	69.4	91	30.6	297	100.0	0.512
	No	316	67.1	155	32.9	471	100.0	
Pustules	Yes	208	74.3	72	25.7	280	100.0	0.004
	No	314	64.3	174	35.7	488	100.0	
papule	Yes	210	74.5	72	25.5	282	100.0	0.003
	No	312	64.2	174	35.8	486	100.0	
Cysts	Yes	155	76.7	47	23.3	202	100.0	0.002
	No	367	64.8	199	35.2	566	100.0	
Nodules	Yes	98	73.1	36	26.9	134	100.0	0.158
	No	424	66.9	210	33.1	634	100.0	

Regarding the role of acne site on complication, table (3-4) demonstrate that complication of acne occurs when acne was in the face, back and chest (0.000, 0.019, and 0.003 respectively), while there was no significant complication when the acne was in neck and shoulders (0.311 and 0.139).

Table 4: Association of acne site and complication.

Acne site		Complications				Total		P. Value
		N	%	N	%	N	%	
Face	Yes	487	69.9	210	30.1	697	100.0	0.000
	No	35	49.3	36	50.7	71	100.0	
Back	Yes	238	72.6	90	27.4	328	100.0	0.019
	No	284	64.5	156	35.5	440	100.0	

Neck	Yes	45	73.8	16	26.2	61	100.0	0.311
	No	477	67.5	230	32.5	707	100.0	
Chest	Yes	116	78.4	32	21.6	148	100.0	0.003
	No	406	65.5	214	34.5	620	100.0	
Shoulders	Yes	172	71.7	68	28.3	240	100.0	0.139
	No	350	66.3	178	33.7	528	100.0	

This table showed that stress and exam have increased the appearance of acne. Also in this table, all types of factors are significantly associated with acne complications except certain drugs.

Table 5: Effect of certain factors on acne appearance and acne complication.

Factors	Acne affected (increased)		Acne complicated	
	%	N	%	P value
Certain type of food	34%	265	75.10%	0.002
Lack of sleep	37%	286	75.90%	0.00
Cosmetics	29%	226	82.70%	0.00
Stress and exams	78%	600	72.30%	0.00
Certain type of drugs	4.90%	38	71.10%	0.676
Sunlight exposure	33.46%	257	77%	0.00
Shaving	31.90%	245	62.90%	0.038

Regarding the effect of diet on acne appearance, this figure (15) showed that food that is rich in carbohydrate (89.09%), while healthy diet has the least incidence of acne appearance (11.45%):

Diet rich in carbohydrates and food containing dairy products has a significant effect on acne complications (0.024, 0.043 respectively), while other types of diet show no significant effect on acne complications.

Table 6: Effect of diet on acne complication.

Diet		Complications				Total		P. Value
		N	%	N	%	N	%	
Contains dairy product	Yes	178	73.0	66	27.0	244	100.0	0.043
	No	344	65.6	180	34.4	524	100.0	
Healthy diet	Yes	55	62.5	33	37.5	88	100.0	0.243
	No	467	68.7	213	31.3	680	100.0	
Rich in carbs	Yes	474	69.3	210	30.7	684	100.0	0.024
	No	48	57.1	36	42.9	84	100.0	
Rich in fat or keto diet	Yes	62	66.7	31	33.3	93	100.0	0.774
	No	460	68.1	215	31.9	675	100.0	
Rich in protein	Yes	100	72.5	38	27.5	138	100.0	0.211
	No	422	67.0	208	33.0	630	100.0	

The high percent of acne patent depends on face washing as treatment type, acne resolved significantly by all type of treatment modality, also with all type of treatment acne show complication, as illustrated by table (7).

Table (3-7): Effect of different types of treatment modality on acne resolving and complication.

Use of acne treatment	Usage			Acne resolved		No benefit
	%	N	%	P value	%	P value
Face washing	49.80%	383	35.20%	0.00	76.00%	0.00
Home treatment	15.30%	121	32.20%	0.003	76.00%	0.038
Acne cream	31.93%	251	30.70%	0.00	80.90%	0.00
Skin cleanser	23.02%	181	34.30%	0.001	77.30%	0.002
Lotions	27.73%	218	35.80%	0.002	75.70%	0.00
No treatment	20.48%	161	59.60%	0.00	44.70%	0.004

Discussion

Acne vulgaris topped the list of common skin diseases among crucial and wide population of teenagers and adolescents, because of its relative chronicity and possible disfiguring effects, and the psychological implication that will reduce their normal and social activities.

Among 768 students, the highest percentage was among students below 20 years of age (55.98%), and is more common in females than male's male: female ratio is (1:2.8) in Saudi study the ratio was (1:3.9) [19]. Researchers from USA showed that acne increase around the time of menstruation and of the pre-menopausal women surveyed, 62.2 percent noted that their acne gets worse around the time of menstruation [20]. In this study, 42% have almost clear, 34% have mild, 20% have moderate, 4% severe while in Iran the severe form account about 2.8% [21]. However, the severe form affects males more than females. A severe form in males: female is 5.4%:3.9%, in Iran was 4.9%:1%. Some researchers said that the cause of more severe form in men is because men produce more testosterone than women, which results in thick and oily skin. The production of sebum, or oil, is also higher in males because their sebaceous glands are more active (from the testosterone) [22].

Regarding the complications, it appeared that 30% have pigments, 21% have scars, 15% have to peel off the skin, and 10% have painful inflammatory reactions only and 24% have no complication, and females have more complications than males (74%, 49% respectively).

Dermatology clinic demonstrated a 95% of their acne attendants to suffer some degree of scarring as a complication [23]. Department of Dermatology in Mumbai observe that 48% of their patients have post-acne problems.

Scarring is one of the most common complications of acne which patients seek treatment for. This study suggests the more severe inflammation of acne the more severe will be the scar so the study compared the complication with the severity of acne, the result was 88% of patients with severe acne progressed to acne scarring and 78% of patients with moderate acne progressed to have acne scar. In an Indian study, 54% of patients with severe acne progressed to acne scarring [24].

In the United States, they found that males have more complications than females. Males have a long time of acne appearance and

delay of treatment so that they have more scars, while females are cosmetically more concerned, this makes females Seek more medical help [25].

The distribution of acne according to skin types and was 50% combined, 42% oily, 8% dry, Similar to a study in Hail, Saudi Arabia where Combined Skin was 53%, oily skin 31%, dry skin 16% [26], the similarity in the results is because of the same weather conditions in these countries.

This study found that there is a relationship between the type of skin and severity of acne, the severity of acne in oily skin was 50% while in combined skin 42%, dry skin 8%. The results were similar to a study was done among acne patients in a suburban population that found the prevalence of oily skin was 61.4% and there is a relationship between severity of acne and oiliness [27].

Kulthanan et al. reported two-thirds of acne patients to have oily skin [28]. The Association between acne and oily skin may be explained by increased sebum secretion and it is a major concurrent event associated with the development of acne.

This study also found that stress is the main factor that affects acne appearance. The results showed that about 78% of medical students claimed that stress and exams are the main factors that affect and complicate their acne while 37% think that lack of sleep is the aggravating factor and 34% thought that certain type of food, while 33.46% said that sunlight exposure could complicate their acne, all of these factors were statistically significant ($p < 0.01$). Similar to a study at King Abdul-Aziz university among 144 6th year female medical students (aged 22–24 years), in this study, students with higher stress scores of perceived stress determined by using PSS had a higher acne grade, which was found using GAGS. This was statistically significant ($p < 0.01$) [29].

Stress and lack of sleep among medical students are common among Iraqi medical students specially among female students and is associated with many diseases such as irritable bowel syndrome [30].

It's also similar to a study performed in Australia among final year medical students at the University of Melbourne, 67% of students identified stress as an exacerbating factor [31] Also, a multicenter epidemiological study from patients who visited 17 Korean hospitals was conducted. It found that the main triggering factor was psychological stress and was reported by 82% of patients [32].

Regarding the association between type of diet and acne complication, Medical students (89.09%) claimed that a diet rich in carbs affect their acne appearance more than dairy products (31.77%) and 17.96% were on a diet that rich in protein, and 12.10% were on a diet that rich in fat, while 11.45% were on a healthy diet, significant association with $P \text{ value} < 0.01$ was found with both-carb rich and dairy product-rich diets in comparison to a study done in Al Kindy University college of medicine shows

that sweet and spicy food (P-value =0.002) for sweet intake and (P=0.001) for spice food are more significant aggravating factors than other types of food [33]. A similar study was also conducted in Saudi Arabia, it included 700 students of both sexes, living in different regions of Riyadh. The respondents were asked for their opinions on acne. The study demonstrated that as many as 72.1% of the persons taking part in the study believed in the role of diet in the pathogenesis of acne [34].

Regarding the site of acne appearance, this study showed that the face is the most affected site, with 90.75% of 768 students, followed by back 42.70%, shoulders 31.25% chest 19.27%, and neck 7.90%. Similar results in research done by King Abdul-Aziz University, college of medicine, Jeddah, Saudi Arabia showed a similar results, acne prefers areas of skin containing abundant oil gland and mostly pollutant exposed by dirty hands contact [35,36].

As for relating the acne site with acne complications, significant association with p value <0.5 was noticed with the following sites: face, back and chest, the commonest complication is skin scarring specifically with nodular and cystic acne [36].

Dairy product and high carb diet were the incriminated type of diet having significant association with acne complication (p value <.05%), as compared to a similar study showing that consuming high fat, high sugar diet actually worsened acne, while low sugar ,low fat diet showed improvement [37].

Besides stress also worsened and complicated acne in our study sample, this finding was also supported in other study that showed that stress may worsen acne by different mechanisms [38].

Regarding treatment modalities used by our sample ,almost 45% of the students were treating their acne, the most used treatment was face washing (383 students 49.80%) using specific soaps, 35.20% (P. Value 0) of them noticed resolve of their acne.

While others tried self-medication like acne creams (251, 31.93%) and 30.70% (P. Value 0), lotions (218 students, 27.73%) and 35.80% (P. Value 0.002), skin cleansers (181, 23.02%) and 34.30% (P. Value 0.001) have noticed progress, while 161 students didn't use any treatment.

Frequent face washing and the use of skin cleanser did improve the condition; however, excessive washing may have a negative impact due to skin drying [39].

Conclusion

About three-quarters of our sample who were affected by acne were females, about quarter of the students have moderate-severe acne. The majority of acne types were cyst, papule, and pustule. The face and chest are the commonest sites for acne. Factors having significant association with acne complications were high carb and fatty diet, stress, face washing showed acne improvement.

References

1. Thibout D, Gollnick H, Bettoli V, et al. New insights into the management of acne: An update from the global alliance to improve outcomes in acne group. *J Am Acad Dermatol.* 2009; 60: 1-50.
2. Wolkenstein P, Grob JJ, Bastuji-Garin S, et al. French people and skin diseases: results of a survey using a representative sample. *ArchDermatol.* 2003; 139: 1614-1619.
3. Manjunath Hulmani, Asha Bullappa, Shruti Kakar, et al. Knowledge, attitude, and practice towards acne vulgaris among acne patients. *International Journal of Research in Dermatology.* 2017; 3: 107-110.
4. Manal Saeed Alanazi, Sabry Mohamed Hammad, Amal Elwan Mohamed. Prevalence and psychological impact of Acne vulgaris among female secondary school students in Arar city, Saudi Arabia, in 2018. *Electron Physician.* 2018; 10: 7224-7229.
5. Anthony HT Jeremy, Diana B Holland, Susan G Roberts, et al. Inflammatory events are involved in acne lesion initiation. *Journal of Investigative Dermatology.* 2003; 121: 20-27.
6. Koo JYM, Smith LL. Clinical and laboratory investigations. Psychologic aspects of acne. *Pediatric Dermatology.* 1991; 8: 185-188.
7. Leyden JJ. Therapy for acne vulgaris. *The New England Journal of Medicine.* 1997; 336: 1156-1162.
8. Jennifer Burris, William Rietkerk, Kathleen Woolf, et al. Relationships of self-reported dietary factors and perceived acne severity in a cohort of New York young adults. *Journal of the Academy of Nutrition Dietetics.* 2014; 114: 384-392.
9. Healy E, Simpson N. Acne vulgaris. *British Medical Journal.* 1994; 6932: 831-833.
10. Hassan J, Grogan S, Clark-Carter D, et al. The individual health burden of acne: appearance-related distress in male and female adolescents and adults with back, chest and facial acne. *J Health Psychol.* 2009; 14: 1105-1118.
11. Arnold L, Levenson JL. *American Psychiatric Publishing Textbook of Psychosomatic Medicine.* American Psychiatric Publishing Inc. 2005; 6: 629-646.
12. <http://patient.info/health/acne-leaflet>
13. Foo CC, Goon AT, Leow YH, et al. Adverse skin reactions to personal protective equipment against severe acute respiratory syndrome—a descriptive study in Singapore. *Contact Dermatitis.* 2006; 55: 291-294.
14. Gheisari M, Araghi F, Moravvej H, et al. Skin reactions to non-glove personal protective equipment: an emerging issue in the COVID-19 pandemic. *J Eur Acad Dermatol Venereol.* 2020; 34: 297-298.
15. Narang I, Sardana K, Bajpai R, et al. Seasonal aggravation of acne in summers and the effect of temperature and humidity in a study in a tropical setting. *J Cosmet Dermatol.* 2019; 18: 1098-1104.

16. https://apps.who.int/iris/bitstream/handle/10665/66154/WHO_EDM_QSM_00.1_eng.pdf?
17. Shivaswamy KN, Shyamprasad AL, Sumathy TK, et al. Knowledge of acne among medical students: pretest and posttest assessment. *ISRN Derm*. 2014; 2014: 727-981.
18. <https://www.americanskin.org/resource/acne.php>
19. Ali M Al-Ameer, Omar M Al-Akloby. Demographic features and seasonal variations in patients with acne vulgaris in Saudi Arabia: a hospital-based study. *International journal of dermatology*. 2002; 41: 870-871.
20. www.sciencedaily.com/releases/2007/10/071019155627.htm
21. Mohammad Taqhi Noorbala, Bahareh Mozaffary, Mohammad Noorbala. Prevalence of acne and its impact on the quality of life in high school-aged adolescents in Yazd, Iran. *Journal of Pakistan Association of Dermatologists*. 2013; 23: 168-172.
22. <https://www.englishdermatology.com/san-tan-valley/news/the-difference-between-male-female-acne>
23. Layton AM, Henderson CA, Cunliffe WJ. A clinical evaluation of acne scarring and its incidence. *Clin Exp Dermatol*. 1994; 19: 303-308.
24. Dipty A Agrawal, Niti Khunger. A Morphological Study of Acne Scarring and Its Relationship between Severity and Treatment of Active Acne. *Journal of cutaneous and aesthetic surgery*. 2020; 13: 210-216.
25. Jerry Tan, Sewon Kang, James Leyden. Prevalence and Risk Factors of Acne Scarring Among Patients Consulting Dermatologists in the United States. *J Drugs Dermatol*. 2017; 16: 97-102.
26. Alshammrie FF, Alshammari R, Alharbi RM, et al. Epidemiology of Acne Vulgaris and Its Association With Lifestyle Among Adolescents and Young Adults in Hail, Kingdom of Saudi Arabia: A Community-Based Study. *Cureus*. 2020; 12: 9277.
27. Hazarika N, Rajaprabha RK. Assessment of life quality index among patients with acne vulgaris in a suburban population. *Indian J Dermatol*. 2016; 61: 163-168.
28. Kulthanan K, Jiamton S, Kittisarapong R. Dermatology life quality index in Thai patients with acne. *Siriraj Med J*. 2017; 59: 3-7.
29. Zari S, Alrahmani Dana. The association between stress and acne among female medical students in Jeddah, Saudi Arabia. *Clin Cosmet Investig Dermatol*. 2017; 10: 503-506.
30. Sadiq M, Salih AA. The prevalence of irritable bowel syndrome and associated factors among a sample of medical college students in Baghdad. *J Med Case Rep Rev*. 2019; 2: 133-136.
31. Green J, Sinclair RD. Perceptions of acne vulgaris in final year medical student written examination answers. *Australas J Dermatol*. 2001; 42: 98-101.
32. Suh DH, Kim BY, Min SU, et al. A multicenter epidemiological study of acne vulgaris. *Int J Dermatol*. 2011; 50: 673-681.
33. Abbas MY, Mohammed AZ. Prevalence, clinical types, aggravating factors and complications of acne vulgaris among medical students in Al-Kindy college of Medicine, Ann Trop Med Public Health. 2020; 23: 231011.
34. Al-Hoqail IA. Knowledge, beliefs and perception of youth to ward acne vulgaris. *Saudi Med J*. 2003; 24: 765-768.
35. Ibrahim NK, Nagadi SA, Idrees HJ, et al. Acne vulgaris: Prevalence, predictors, and factors influencing quality of life of female medical students at King Abdulaziz University Jeddah. *J Dermatol Dermatol Surg*. 2019; 23: 7-12.
36. American Academy of Dermatology. Acne. 2023.
37. Roengritthidet K, Kamanamool N, Udompataikul M, et al. Association Between Diet and Acne Severity: A Cross-sectional Study in Thai Adolescents and Adults. *Acta Derm Venereol*. 2021; 101: 611.
38. Zari S, Alrahmani D. The association between stress and acne among female medical students in Jeddah, Saudi Arabia. *Clin Cosmet Investig Dermatol*. 2017; 10: 503-506.
39. Choi JM, Lew VK, Kimball AB. A single-blinded, randomized, controlled clinical trial evaluating the effect of face washing on acne vulgaris. *Pediatr Dermatol*. 2006; 23: 421-427.