Evaluation of Acne Prevalence and Assessment of Knowledge, Attitude and Practice Regarding this Disease among Students of Health Related Colleges at University of Jordan

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

Original Research Article

ABSTRACT

Introduction: Acne vulgaris is a multifactorial disease involving pilosebaceous unit of skin, considered commonest dermatological disease, accounts for 16% of the global dermatological burden. Despite that, acne has a lot of circulating misbelieves and misconceptions with poor practice and attitude, unfortunately no local study to address these issues among students. This study conducted to evaluate prevalence of acne vulgaris and to assess knowledge attitude and practice.
Methodology: A cross sectional descriptive study conducted in Amman, capital of Jordan from January 2022 to April 2022 among students of health-related colleges at university of Jordan. Sample consisted of 600 students distributed among 5 colleges, each participant answered structured questionnaire containing 33 items.

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Results: Sample consisted of 600 students, 55.8% were males, 44.2% were females, with 36.7% prevalence of acne. Mean age and standard deviation was21.75±1.99 years. Significant association was found between acne and younger age (p = 0.016), and lower income (p = .002). Around 60% of sample had poor knowledge score with significant relation between students' score and age group (p = .002), gender (p = <.001), and students' college (p = .014).

Discussion and Conclusion: First observation of our study was the significantly low knowledge of students, only forty percent had good score with risk for poor score associated with younger age, and male sex. In general students' attitude and practice was favorable with few exceptions. Implications to our study include awareness-raising campaigns directed at younger age groups, while ensuring education on correct management including attitude and practice.

Keywords: Acne vulgaris; pilosebaceous; hyperpigmentation.

1. INTRODUCTION

Acne vulgaris, or acne, is a multifactorial disease involving pilosebaceous unit of skin, affecting mainly face, shoulders, upper chest and back, and considered the eighth most relevant disease worldwide, and commonest dermatological disease among adolescents, accounts for 16% of the global dermatological burden [1]. It peaks during adolescence affecting around 80% of teenagers, suggesting hormonal influence either on amount of sebum production or alteration in its components, but can affect any age group from neonatal acne to older post-menopausal women for example [2,3].

Acne is known to have a genetic component and influence, as it tends to run in some families and be more severe in others, a study of almost hundred sets of twins revealed98% of identical twin pairs were affected comparing to 46% of dizygotic twin, but no particular genetic causes has been identified so far [4]. Several other factors are known to be linked to acne, including an inflammatory process with a role of neutrophil, CD4 lymphocytes, Interleukin-1, and Propionibacterium acnes bacteria, a gram-positive bacteria, proceeded by hyperkeratinization and occlusion of follicular duct [5]. The disease can be presented with a range of symptoms from papulopustular to nodulocystic leaving behind residual scaring and hyperpigmentation [6]. Recent studies investigated association between stress and severity of acne and demonstrated a statistically convincing association between stress and exacerbation of acne, [7-9] on the other hand the disease has a significant psychological burden on the patient affecting different social and psychological life aspects, causing mental health problems, depression, anxiety and suicidal ideation [10]. Neirita and Archana recently reported a significant impact of acne on psychosocial life of patient producing embarrassment/self-consciousness, interpersonal problems, and sexual difficulties, raising the need for further studies to assess quality of life for acne patients [11].

The relationship between acne and food/diet is controversial, several studies suggested a role of nutrition on either acne pathogenesis or its exacerbation [12], while others found no statistically significant association [13]. Conforti and colleagues found high glycemic index as triggering factor for acne pathogenesis, and milk and chocolate as exacerbating factors [12]. Bowe and her colleagues in their recent review of literature found a compelling evidence of association between acne and high glycemic load, weak association with dairy products, while association with omega-3 fatty acids, antioxidants, zinc, vitamin A, and dietary fiber need to be investigated more [13].

Many other factors have been confirmed to be associated with acne lesions or has an effect on their exacerbation, these includes, medications (anabolic steroids, corticosteroids, iodides, isoniazid, lithium and others) [14], hormonal imbalance and endocrine disorders [15,16], repetitive mechanical friction (maskne, acne mechanica) [17], and occupational/environmental acne due to exposure to occluding substance (acne cosmetica, oil, petroleum and coal tar derivatives) [18].

Despite being one of the commonest diseases, acne has a lot of circulating misbelieves and misconceptions with poor practice and attitude, according to a French study of 852 individuals, around 80% of them did not consider acne as a disease but rather as a normal phase of adolescence, yet around 70% of them agreed it needs a treatment [19]. Saudi study of 555 students concluded poor practice and unfavorable attitude in spite of good knowledge among medical students [20].

Locally, only one study was conducted in Jordan to assess knowledge, attitude and practice toward acne from community perspective, Alkhawaja et al found that around 45% of participants considered acne as a contagious disease, 48% considered squeezing acne lesions helps healing them, while poor skin hygiene was commonest cause of acne according to participants (33.6%), and diet was the commonest aggravating factor (42.8%) [21]. These results shows how common are misbeliefs and misconceptions among Jordanian community. On the other hand, unfortunately we did not find any local study to assess knowledge attitude and practice toward acne vulgaris among university students or among students of health-related colleges particularly, as they will be most likely treating and dealing with acne patients in the near future.

We conducted this study to evaluate the prevalence of the disease and to assess knowledge attitude and practice among students of health-related colleges at university of Jordan, hoping to cover the gap and to provide a useful data for policy maker in the future when considering promoting health education regarding the disease.

2. MATERIALS AND METHODS

2.1 Study Design and Population

A cross sectional descriptive study was conducted in Amman city, capital of Jordan from January 2022 to April 2022 among students of health-related colleges at university of Jordan. These are five colleges, which are; college of medicine, college of nursing, college of pharmacy, college of dentistry, and college of rehabilitation sciences. All participants were asked to provide written consent for their participation and were then interviewed privately and confidentially to answer questions to an Arabic questionnaire that did not include identifying information.

2.2 Sampling

Total number of students in selected colleges was 11402 students according to office of university's vice president for students' affairs. Recent studies estimate that self-reported acne among adolescents and university students has a sensitivity of 55% and specificity of 72% [22,23]. Total size of our sample consisted of 600 students calculated by following formula of sample size calculation:

$$N = \frac{z^2 \times p \times q}{e^2}$$

- (n) = size of the sample - (z) = standard variation =1.96

- (p) = sample proportion =6.7% - (q) = 1 - p = 1 - 0.067=0.933

- (e) = acceptable error =2%n = $(1.96)^2$ × 6.7 × 93.3 / $(2)^2$ = 600

Twenty more students were added to cover for any questionnaire missing data to be excluded later, Fig. 1.

The sample was chosen by probability multi-staging random selection. It involves the following steps, 5 colleges of health-related sciences at university of Jordan were included in the study, random selection of one class from each level, then selection of the target number of students from the previously selected level according to students' number and sex, and finally filling the questionnaire by the selected students.

2.3 Data Collection Tool and Pilot Study

Data was collected using structured questionnaire contain 33 items and consists of three sections. First section was about students' sociodemographic characteristics including age, gender, household income, height, weight, and college. Second section consisted of fifteen questions of risk factors and general knowledge regarding acne vulgaris to measure students' knowledge about the disease, they were designed in yes, no and I don't know format. Third section consisted of twelve questions, six to assess students' attitude toward acne vulgaris, and remaining six to evaluate and appraise students' practice toward disease. Pilot study was done on 5th of January 2022. A total of 30 questionnaires were distributed, which led to some minor modifications being done in the questionnaire. Their data were not included in the final analysis of the study.

2.4 Measuring Knowledge' Score

Students' knowledge toward acnevulgaris assessed using fifteen questions, every correct answer was counted as 1 point, and every incorrect answer was counted as 0 point, while I don't know was also counted as 0 point, adding points together resulted with every student has a knowledge score ranging from 0 to 15 points.

Other studies measured knowledge score with similar ways [20,24], and categorized score to poor and good, we considered a score of8 as a cut-off point, 1-8 considered as a poor score 9 and more was considered as good knowledge score.

2.5 Statistical Methods

Data was entered into IBM SPSS 26. Descriptive analysis was performed to find proportions and counts, and the mean age and standard deviation. Moreover, Chi-square test was used to assess the relationship between all of students' sociodemographic variables and prevalence of acne vulgaris, it was also used to assess the relationship between sociodemographic variables and students' knowledge score, and P value of< .05 was considered the cut-off for statistically significant relationship. Finally, data were presented in Tables using Microsoft word and Excel 2019.

Required sample size

$n = 600$ students

30 students added to cover for any missing data (630)

Students approached to fill questionnaire (630)

Thirty questionnaires were excluded due to missing data

Total included students were $n = 600$ distributed among five colleges

Medicine ($n = 153$)

Pharmacy ($n = 81$)

Nursing ($n = 157$)

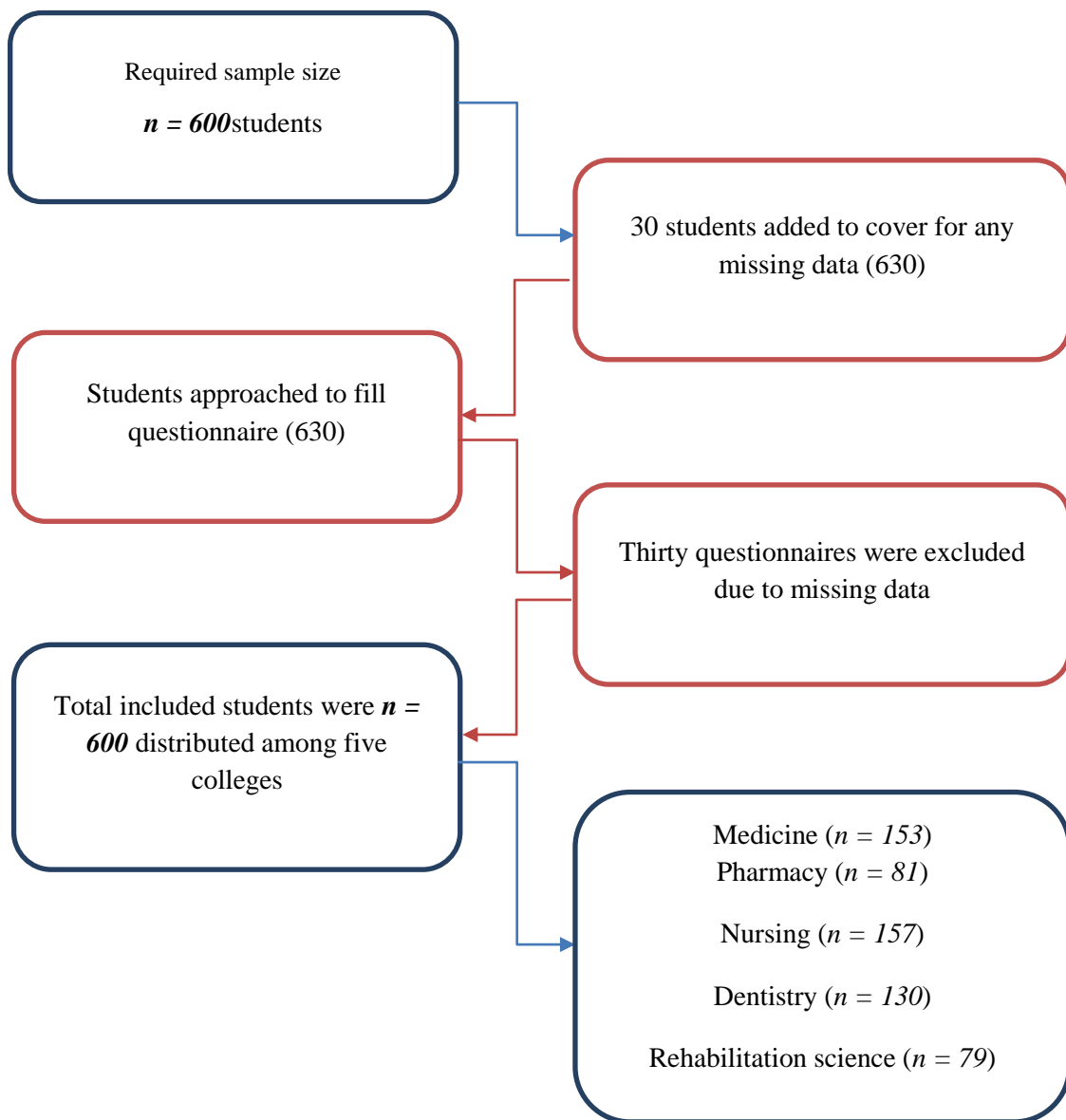Dentistry ($n = 130$)

Rehabilitation science ($n = 79$)

Fig. 1. Flowchart of questionnaire collection

3. RESULTS

3.1 Sociodemographic Characteristics of Students and Theirimpact on Prevalence of Acne Vulgaris

Our study included 600students of health-related colleges, 335 (55.8%) of them were males, 265 (44.2%) were females, and prevalence of acne among total sample was 36.7% as 220 students reported themselves having acne, with statically insignificant relationship between acne and students' gender (p = .457).The mean age and standard deviation of the total sample was21.75±1.99years, and 20.95±2.01 years for those who had acne, while commonest age group for total sample was 21-23 years, 481(80.2%)students, followed by age group of 24-26 years, 72 (12%) students, almost similar results were among those who had acne with mild differences (p = 0.016).4.3% of students has household income of less than 600JordanianDinars (JD), 67.5% has household income between 600-1200JD, 28.2% with household income of more than 1200JD per month, with statically significant risk for acne associated with lower household income (p = .002). Around half ofstudents48.7% had normalbody mass index (BMI), while remaining half had BMI distributed among underweight,

overweight and obese, with insignificant relationship between acne and BMI (p = .288). Regarding students' colleges, half of sample 51.7% were students of college of nursing and college of medicine, while remaining half distributed among remaining three colleges (p = .138), Table 1.

3.2 Students' Knowledge and their Knowledge' Score Toward Acne Vulgaris

Table 2 shows knowledge of health-related colleges' students regarding factors affecting acne or aggravating its condition. Most believed factors were squeezing and pinching acne lesions (71.3%), type of food (68.8%), emotional/psychological stress (66%), oily/greasy skin (64.3%), menstrual cycle (59.3%), and make-up/cosmetics(55.8%). Most irrelevant factors chosen by students incorrectly were systemic medications (52.7%) followed by topical creams/ointments (46%).

Table 2 also shows that 40% of sample thinks acne is not infectious disease, 47.7% thinks it's a hereditary disease, 41.2% thinks it can't affect other age group than adolescence, and 35.3% thinks it can occur on sites other than the face.

Table 1. Prevalence of Acne vulgar is among students of health-related colleges distributed according to their socio demographic characteristics, Amman city, January-April 2022

Sociodemographic characteristics		Do you have acne			P-value*
		Yes *n(%)*	No *n(%)*	Total *n(%)*	
Age (mean ± sd)		20.95±2.01	21.72±1.96	21.75±1.99	.016
Age group	18-20 years	24 (10.9%)	20 (5.3%)	44 (7.3%)	
	21-23 years	177 (80.45%)	304 (80%)	481 (80.2%)	
	24-26 years	18 (8.2%)	54 (14.2%)	72 (12%)	
	27 years and more	1 (0.45%)	2 (0.5%)	3 (0.5%)	
Gender	Male	125 (56.8%)	210 (55.3%)	335 (55.8%)	.457
	Female	95 (43.2%)	170 (44.7%)	265 (44.2%)	
Household Income	<600 JD	18 (8.2%)	8 (2.1%)	26 (4.3%)	.002
	600-1200JD	146 (66.4%)	259 (68.2%)	405 (67.5%)	
	>1200JD	56 (25.4%)	113 (29.7%)	169 (28.2%)	
BMI	Underweight	36 (16.4%)	81 (21.3%)	117 (19.5%)	.288
	Normal	105 (47.7%)	187 (49.2%)	292 (48.7%)	
	Overweight	61 (27.7%)	84 (22.1%)	145 (24.2%)	
	Obese	18 (8.2%)	28 (7.4%)	46 (7.7%)	
Health-related College	Medicine	56 (25.5%)	97 (25.5%)	153 (25.5%)	.138
	Pharmacy	38 (17.3%)	43 (11.3%)	81 (13.5%)	
	Nursing	47 (21.4%)	110 (29%)	157 (26.2%)	
	Dentistry	48 (21.8%)	82 (21.6%)	130 (21.7%)	
	Rehabilitation sciences	31 (14.1%)	48 (12.6%)	79 (13.2%)	

*BMI= body mass index. *Chi square test*

Table 2. Knowledge of Acne vulgaris among students of health-related colleges at University of Jordan, Amman, January-April 2022 (n=600)

No	Knowledge	Yes *n (%)*	No *n (%)*	I Don't know *n (%)*
	Factors affecting Acne			
1	Oily/greasyskin	386 (64.3%)	75 (12.5%)	139 (23.2%)
2	Sun exposure	226 (37.7%)	183 (30.5%)	191 (31.8%)
3	Facial makeup and cosmetics	335 (55.8%)	122 (20.3%)	143 (23.8%)
4	Topical cream/ointment (steroid, thick emollient)	124 (20.7%)	276 (46%)	200 (33.3%)
5	Systemic drugs (OCP, steroid, Anticonvulsants, B12)	98 (16.3%)	316 (52.7%)	186 (31%)
6	Worsening by squeezing and pinching	428 (71.3%)	66 (11%)	107 (17.7%)
7	Psychological/Emotional stress	396 (66%)	109 (18.2%)	95 (15.8%)
8	Affected by menstrual cycle	356 (59.3%)	91 (15.2%)	153 (25.5%)
9	Poor skin hygiene	322 (53.7%)	182 (30.3%)	96 (16%)
10	Some types of food (oily, chocolate, fast food)	413 (68.8%)	163 (27.2%)	24 (4%)
11	Drinking sugar-sweetened beverage	309 (51.5%)	175 (29.2%)	116 (19.3%)
	General Knowledge			
12	Is it infectious?	176 (29.3%)	240 (40%)	184 (30.7%)
13	Is it a hereditary disease mainly?	286 (47.7%)	194 (32.3%)	120 (20%)
14	Can affect people in any age group?	111 (18.5%)	247 (41.2%)	242 (40.3%)
15	Can occur in sites other than face?	212 (35.3%)	192 (32%)	196 (32.7%)

Table 3 shows students' knowledge score and its relationship with students' sociodemographic characteristics, 364 students had poor knowledge score constituting 60.7% of the sample, remaining 236 (39.3%) had good score. Statistically significant relationship was found between students' score and age group (p = .002), gender (p = <.001), and students' college (p = .014).

3.3 Students' Attitude and Practice toward Acne Vulgaris

Regarding students' attitude toward acne, 456 (76%) said acne has social/psychological impact on them, 457 (76.2%) did not feel acne has an effect on their studying performance, 335 (55.8%) thinks acne patient should visit dermatologist, 290 (48.2%) thinks acne can be treated with home remedies, 362 (60.3%) said its not acceptable to treat acne with non-medical advice from patients' surrounding, and 374 (62.3%) students didn't think doctor's follow-up visit is important Table 4.

Table 5, shows students' practice toward acne, 386 (64.3%) of them will visit dermatologist for their acne, 247 (41.2%) will treat themselves with home remedies, 250 (41.7%) will use over the counter drugs, 185 (30.8%) will ignore their acne until it become severe, 424 (70.7%) will comply

with treatment even if it takes several months, and 442 (73.7%) of them said they will not comply with non-pharmacological advices.

4. DISCUSSION

Acne is acommon disease with significant dermatological burden affecting the health-system, despite that, it is known to be associated with common myths, misbeliefs and misconceptions, an initial aim of our study was to measure the prevalence of the disease and to assess knowledge attitude and practice of students of health-related colleges at university of Jordan toward acne vulgaris, as they likely will be treating and dealing with acne patients in the near future. The very first observation of our study was the significantly low knowledge of students toward acne vulgaris, only around forty percent had good score with statistically significant risk for poor score associated with younger age, male sex and colleges other than medicine and pharmacy. Two studies from Saudi Arabia found similar results, Allayali, and Asseri found (62.5%) of male students had poor knowledge score [20], Alnafisahet al found (66.1%) of male adolescents had poor knowledge score [25]. A study in Pakistan also found that female students had significantly higher rate of good scores [26], while study in India reported no statistically significant difference between genders [24]. Regarding poor scores of younger students, Hulmani et al

reported similar observation [25], and this could be justified in our study since students are studying dermatology block (including acne vulgaris) during fourth year of college.

The prevalence of acne among sample was (36.7%), similar to prevalence reported by other studies, local Jordanian study amongadolescents and young adult (45%)[27], Syrian studyreported prevalence of (34.7%)[28], and a Montenegrin study has (50%) prevalence of self-reported acne [29]. Highest prevalence was among age group 18-20 years, and became less prevalent in older groups, Malaysian study reported (85.5%) acne prevalence among age group16-18 years and decreased with increasing age [30]. These results are consistent with literature as acne vulgaris tends to peak during adolescence and tend to decrease into late adulthood. Low household income was associated with higher risk for acne, this could be attributed to different risk factors associated with different lifestyle.

Majority of students identified lesions manipulation, oily skin, and stress as risk/aggravating factors for acne, similar results found in other studies [24,26], Saudi study reported that students identified same risk factors [20], this is consistent with literature [7,8]. On the other hand, students weren't able to identify topical medications, systemic medications and sun exposure as risk/aggravating factors, and around half of them thought acne is a hereditary disease and can't affects sites other than face.

Around (76%) acknowledged the social and psychological impact of acne on them, simila results were reported by different studies [26,26], in the end acne remains a disease affecting the appearance and there is good evidence to indicate that this has important ramifications for the well-being of the patient. Around half (48.3%) of our students wrongly thinks acne can be treated with home remedies, and more than half (62.3%) did not recognize the importance of follow-up when treating acne. Regarding acne treatment, more than half (64.3%) said they will visit a dermatologist for their acne. Allayali et al reported that (66.3%) of students willvisit dermatologist [20]. Hulmani et al reported even higher percentage of sample willing to visit dermatologist for their acne [24].

Table 3. Knowledge score of students of health-related colleges at university of Jordan distributed according to their socio demographic characteristics, Amman city, January-April 2022 (n=600)

Sociodemographic variables	Poor score n (%)	Good score n (%)	P-value
Age group			.002
18-20 years	29 (65.9%)	15 (34.1%)	
21-23 years	305 (63.4%)	176 (36.6%)	
24-26 years	29 (40.3%)	43 (59.7%)	
27 years and more	1 (33.3%)	2 (66.6%)	
Gender			< .001
Male	271 (80.9%)	64 (19.1%)	
Female	93 (35.1%)	172 (64.9%)	
Household Income			.099
< 4000 SAR	17 (65.4%)	9 (34.6%)	
4000-8000 SAR	256 (63.2%)	149 (36.8%)	
> 8000 SAR	91 (53.8%)	78 (46.2%)	
BMI			.071
Underweight	74 (63.2%)	43 (36.8%)	
Normal	185 (63.4%)	107 (36.4%)	
Overweight	80 (55.2%)	65 (44.8%)	
Obese	35 (76.1%)	11 (23.9%)	
College			.014
Medicine	79 (51.6%)	74 (48.6%)	
Pharmacy	43 (53.1%)	38 (46.9%)	
Nursing	107 (68.2%)	50 (31.8%))	
Dentistry	86 (66.2%)	44 (33.8%)	
Rehabilitation sciences	49 (62%)	30 (38%)	

Table 4. Attitude of students of health-related colleges at university of Jordan towards Acne vulgaris, Amman, January-April 2022 (n=600)

No	Attitude	Agree	Disagree	No opinion
1	Does acne have a social or psychological impact on you?	456 (76%)	87 (14.5%)	57 (9.5%)
2	Do you feel that acne has an effect on your studying competence and performance?	107 (17.8%)	457 (76.2%)	36 (6%)
3	Do you think acne patient should visit dermatologist?	335 (55.8%)	130 (21.7%)	135 (22.5%)
4	Acne can be treated with home remedies (daily face wash, natural masks, strict diet, avoiding stress, avoiding sun exposure)	290 (48.3%)	173 (28.8%)	137 (22.8%)
5	It is acceptable for acne patients to treat themselves with advice from social media, friend, family member, or another acne patient.	163 (27.2%)	362 (60.3%)	75 (12.5%)
6	It is important for Acne patients to keep visiting their doctors for follow-up.	126 (21%)	374 (62.3%)	100 (16.7%)

Table 5. Practice of students of health-related colleges at university of Jordan towards Acne vulgaris, Amman, January-April 2022. (n=600)

No	Practice	Yes	No
1	Visiting dermatologist for my acne	386 (64.3%)	214 (35.7%)
2	Treating myself with home remedies before visiting a dermatologist	247 (41.2%)	353 (58.8%)
3	Using over the counter drugs	250 (41.7%)	350 (58.3%)
4	I may ignore my acne until it become severe	185 (30.8%)	415 (69.2%)
5	I comply with treatment even if it takes several months	424 (70.7%)	176 (29.3%)
6	I comply with non-pharmacological advices (use less make-up, daily sunblock, non-comedogenic moisturizer and etc.)	158 (26.3%)	442 (73.7%)

In general students' practice toward acne was favorable except for complying with non-pharmacological advices of their doctor.

5. CONCLUSION AND RECOMMENDATION

Our study aimed to assessknowledge, attitude and practice toward acne vulgaris among students of health-related colleges. Our results showed a high prevalence of acne among younger age group, and low household income, and revealed low knowledge score associated with younger age group, male gender and students' college. In conclusion, we found students had poor knowledge with favorable attitude and practice. Implications to our study include awareness-raising campaigns directed at younger age groups, while ensuring education on the importance of correct management including attitude and practice.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Author has declared that no competing interests exist.

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