

ACNE STATUS AND ASSOCIATED FACTORS AMONG UNIVERSITY STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Aims: This study aims to assess the prevalence of acne and identify factors associated with its occurrence among students at Đại Nam University.

Methods: A cross-sectional study was conducted involving 508 students. Participants were surveyed on demographics, lifestyle habits, and family history of acne. Data were analyzed to determine the association between these factors and the prevalence of acne.

Results: The prevalence of acne among the participants was 49.8%, with a slightly higher prevalence in females (50.8%) compared to males (48.0%). Family history of acne was significantly associated with the likelihood of developing acne, with students having family members with acne being 48% more likely to have acne (AOR: 0.48; 95% CI: 0.33-0.71; $p < 0.001$). Students who spent between 500,000 and 1,000,000 VND per month on skincare products had a 53% lower rate of acne compared to those who did not spend money on cosmetics (COR: 0.53; 95% CI: 0.31-0.90, $p < 0.05$). No significant associations were found between other personal characteristics or lifestyle habits and acne prevalence.

Conclusions: Acne is common among students at Dai Nam University, with family history and skincare spending being significant factors in its prevalence. Health education programs on skincare may help prevent acne and improve awareness among students. Further research is needed to explore the biological and environmental factors influencing acne in young adults.

Keywords: Acne status, Related factors, University students, DNU.

1. INTRODUCTION

Acne is a self-limiting disease of the pilosebaceous unit, primarily affecting adolescents. It is one of the most common skin conditions, impacting around 85% of young people to varying degrees [1], [2], [3]. Typically, acne resolves before the age of 25. However, in cases where it persists, it can leave long-term effects, such as atrophic or hypertrophic scars, which may lead to psychological and emotional distress and adversely impact quality of life [4], [5]. Acne is a common skin condition affecting both males and females, with most cases occurring between the ages of 13 and 25, although it may persist into adulthood, sometimes even appearing after age 25 or in the 40s or beyond [6]. Acne is so prevalent that it is often considered a normal physiological condition. Acne, particularly common acne, affects 95–100% of males and 83–85% of females around ages 16–17 [7]. The condition is more prevalent in females and tends to occur more frequently in individuals with lighter skin tones. Acne manifests

through various lesions, such as blackheads, whiteheads, papules, pustules, nodules, and cysts, often leaving atrophic or hypertrophic scars as a result [8], [9]. Acne treatment remains challenging due to the variable nature of the condition. Some cases improve gradually, but others may persist chronically with relapses, especially if not treated promptly and appropriately, leading to severe clinical forms and significant long-term cosmetic impact.

In Vietnam, acne is a prevalent condition among adolescents. Most patients engage in self-treatment, using cosmetics, unverified creams bought from markets, beauty spas, or traditional remedies. Additionally, some self-medicate, extract pimples, or seek massages, which often exacerbates the condition and leads to complications such as allergic dermatitis, hyperpigmentation, scarring, and pitting. In the current context, where awareness of skincare and health is

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increasingly prioritized, understanding the prevalence of acne and related factors among university students is particularly meaningful. This study aims to assess acne prevalence and some associated factors among students at Dai Nam University in 2024.

2. MATERIALS AND METHODS

2.1. Study design

A cross-sectional descriptive study was conducted from October 2023 to April 2024 at Dai Nam university, Hanoi, Vietnam.

2.2. Study subjects

Full-time students studying at Dai Nam University.

- *Inclusion criteria:*

- + All students from all faculties of the 4 majors of the university
- + Students agree to cooperate in the research
- + There are no signs of mental and cognitive damage affecting the completion of the questionnaire.

- *Exclusion criteria:*

- + Students who are not in the regular system and are not present at the university during the data collection period.
- + Students who do not participate in the entire research process.

2.3. Sample size

The study used a total sample size. Using the convenience sampling method, all students studying at Dai Nam University during the data collection period who met the selection criteria were invited to participate in the study. The study collected 508 valid responses.

2.4. Data collection

- *Data Collection Tool*

The data was collected using a pre-designed tool comprising the following sections: Introduction and consent for voluntary participation; General information about the study participants; Acne characteristics: onset, location, severity, and type of acne lesions. Participants who had been examined at medical facilities before or during data collection were diagnosed according to acne severity levels; Dietary, lifestyle, and personal hygiene habits related to the prevention and treatment of acne.

- *Data Collection Method*

The questionnaire was designed and distributed via Google Forms. After designing the survey in Google Forms, a pilot interview was conducted with 3–5 participants to validate the tool. The finalized ques-

tionnaire link and QR code were shared with students at Dai Nam University through various groups and forums. Additional invitations were extended during class breaks. Collected data was reviewed, cleaned, and supplemented daily. The data was exported from Google Forms into an Excel file for analysis.

2.5. Variables and Indicators

The study describes the characteristics of acne and some related factors of students including 3 groups of variables: General information of the research subjects (age, gender, major, current residence, family history of acne); characteristics of acne in students (incidence, severity, location of acne, nature of acne); Some personal, environmental and social factors affecting the incidence of acne in students (personal characteristics, acne-causing habits, spending on skin care activities). Classification of disease severity (mild, moderate, severe) based on the description of the number and type of basic lesions according to Karen McCoy 2008 [10], [11]:

Levels	Define
Mild	Less than 20 non-inflammatory lesions, or less than 15 inflammatory lesions or the total number of lesions less than 30
Moderate	20-100 noninflammatory lesions or 15-50 inflammatory lesions, or 20-125 total lesions
Severity	More than 5 cysts, nodules, or more than 100 non-inflammatory lesions, or total inflammatory lesions over 50 or more than 125 total lesions

2.6. Data Analysis

After collection, the data was exported to excel file, cleaned and analyzed using SPSS 25.0 software.

- Descriptive statistics using frequency and proportion tables. These tables are used to describe the general characteristics of the study subjects and the acne characteristics of the study subjects.

- Inferential statistics: The dependent variable is the rate of acne in students. The independent variable includes variables on the personal characteristics of the study subjects. Univariate analysis to determine a number of factors related (independent variables) to the rate of acne (dependent variable) using the Chi square test. However, in case there is 1 cell of the statistical table with an expected frequency of less than 5, then use the Fisher Exact test. Take the statistical significance level as $p = 0.05$.

2.7. Ethical Considerations

The study was approved by the Board of Directors of Dai Nam University according to Decision No.1031/QĐ-ĐN. The research subjects were clearly explained about the purpose, requirements and significance of the study and participated voluntarily. The study does not affect health: no blood is taken, no medication is used. If the research subjects do not want to continue, they can stop the interview at any time, even while the interview is in progress.

3. RESULTS

Among the 508 participants in this study, 337 (66.3%) were health science students, while 171 (33.7%) were from other majors, including 15.9% in engineering, 14.0% in social sciences, and 3.7% in economics. The average age of participants was 20.21 years (SD = 1.42), with 37.4% over the age of 20. The sample consisted of 329 females (64.8%) and 179 males (35.2%). Most students (45.7%) were in their first year of university, and 68.9% were from rural areas. Additionally, 45.5% of participants reported having family members working in healthcare, and 54.9% had parents or siblings with a history of acne. Furthermore, 75 students (14.8%) reported chronic conditions such as depression, eye diseases, stomach issues, pulmonary diseases, hypertension, or diabetes.

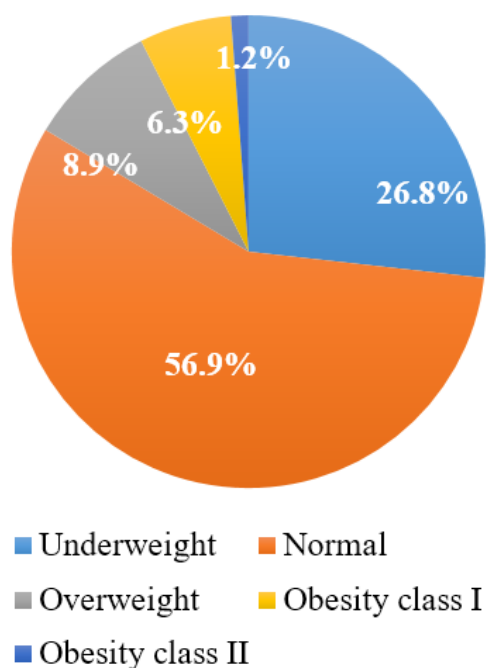


Figure 1. Nutritional status of participants (n=508)

The majority of study subjects had normal nutritional status, notably 26.8% had chronic energy deficiency and 7.5% of students were obese.

Table 2. Some daily living habits related to skin status of the study subjects (n=508)

Habits	Count (n)	Percentage (%)
Drink water		
<1.5 liters/day	144	28.3
>=1.5 liters/day	364	71.7
Drink coffee		
Do not drink	61	12.0
Occasionally	169	33.3
Regularly	278	54.7
Smoke		
No	434	85.4
Yes	74	14.6
Drink alcohol		
Do not drink	210	41.3
Occasionally	282	55.5
Regularly	16	3.1
Usual bedtime		
Before 11.pm	198	39.0
After 11.pm	310	61.0
Face washing		
Do not wash daily	36	7.1
1 time/day	53	10.4
2 times/day	301	59.3
>= 3 times/day	118	23.2
Cover up when going out		
Never	19	3.7
Sometime	76	15.0
Always	413	81.3
Make-up		
Never	353	69.5
Sometime	90	17.7
Always	65	12.8
Monthly spending on cosmetics/skin care (VND)		
None	76	15.0
<100.000	93	18.3
100.000-500.000	227	44.7
500.000-1.000.000	58	11.4
> 1.000.000	54	10.6

Among the habits that are said to affect skin condition, 71.7% of students said they drink 1.5 liters of water per day and up to 54.7% of students regularly use coffee to stay awake, accordingly, 61% said they often stay up late. Most students do not have the habit of smoking (85.4% and only 3.1% often use alcohol. 81.3% of students said they always cover themselves carefully when

going out to avoid dust and sun, 2/3 of the research subjects rarely or never wear makeup, only 10.6% of students spend over 1 million per month to buy skin care and beauty products.

Table 3. Acne prevalence by gender (n=253)

Gender	Diagnosis	
	With acne	Without acne
Male	86 (48.0%)	93 (52.0%)
Female	167 (50.8%)	162 (49.2%)
Total	253 (49.8%)	255 (50.2%)

The prevalence of acne in the study population was 49.8%, of which the prevalence of female students with acne (50.8%) was slightly higher than that of male students (48.0%).

Table 4. Acne locations of participants (n=253)

Location of Acne	Count (n)	Percentage (%)
Face	151	59.7
Back	48	19.0
Chest	24	9.5
Others	30	11.8

The most common location for acne is the face (59.7%), followed by the back (19.0%). Some areas such as the arms, legs, abdomen... have acne but not much.

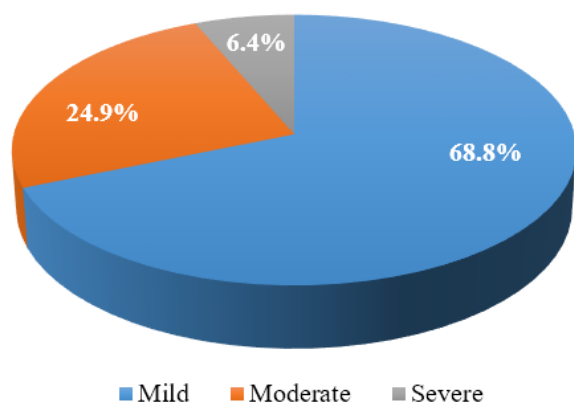


Figure 2. Classification of acne severity of participants (n=253)

Most of the study subjects had mild acne (68.8%), with 16 students having severe acne (6.4%).

Table 5. Some factors related to the current status of research subjects with acne

Factors	Acne		Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes	No		
Gender				
Male	86 (48.0%)	93 (52.0%)	1	1
Female	167 (50.8%)	162 (49.2%)	1.12 (0.77-1.61)	0.69 (0.39-1.23)
Age groups				
<=20	155 (63.1%)	163 (63.9%)	1	1
>20	98 (38.7%)	92 (36.1%)	0.89 (0.62-1.28)	1.06 (0.73-1.59)
Family history of acne				
No	90 (35.6%)	139 (54.5%)	1	1
Yes	163 (64.4%)	116 (45.5%)	2.17 (1.52-3.10)	0.48 (0.33-0.71)
Drink water				
< 1.5 liters/day	66 (26.1%)	78 (30.6%)	1	1
>= 1.5 liters/day	187 (73.9%)	177 (69.4)	0.80 (0.54-1.18)	1.32 (0.86-2.03)
Drink Coffee				
Do not drink	24 (9.5%)	37 (14.5%)	1	1
Occasionally	87 (34.4%)	82 (32.2%)	0.62 (0.35-1.09)	0.72 (0.39-1.31)
Regularly	142 (56.1%)	136 (53.3%)	0.61 (0.34-1.11)	0.74 (0.39-1.40)
Smoke				
No	218 (86.2%)	39 (15.3%)	1	1
Yes	35 (13.8%)	216 (84.7%)	0.89 (0.54-1.46)	1.30 (0.73-2.31)
Drink alcohol				
Do not drink	96 (37.9%)	114 (44.7%)	1	1
Occasionally	151 (59.7%)	131 (51.4%)	1.40 (0.49-4.00)	1.23 (0.39-3.89)
Regularly	6 (2.4%)	10 (3.9%)	0.73 (0.51-1.05)	0.76 (0.51-1.13)
Usual bedtime				
Before 11.pm	91 (36.0%)	107 (42.0%)	1	1
After 11.pm	162 (64.0%)	148 (58.0%)	1.29 (0.90-1.84)	0.81 (0.56-1.19)

Factors	Acne		Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes	No		
Face washing				
Do not wash daily	19 (7.5%)	17 (6.7%)	1	1
1 time/day	23 (9.1%)	30 (11.8%)	1.24 (0.59-2.61)	1.59 (0.71-3.51)
2 times/day	155 (61.3%)	146 (57.3%)	1.05 (0.53-2.10)	1.52 (0.71-3.23)
>= 3 times/day	56 (22.1%)	62 (24.3%)	1.46 (0.62-3.41)	2.08 (0.83-5.16)
Cover up when going out				
Never	6 (2.4%)	13 (5.1%)	1	1
Sometime	32 (12.6%)	44 (17.3%)	0.43 (0.16-1.14)	0.45 (0.15-1.34)
Always	215 (85.0%)	198 (77.6%)	0.64 (0.22-1.85)	0.66 (0.21-2.07)
Make-up				
Never	177 (70.0%)	176 (69.0%)	1	1
Sometime	42 (16.6%)	48 (18.8%)	0.92 (0.54-1.56)	0.93 (0.52-1.66)
Always	34 (13.4%)	32 (12.2%)	1.15 (0.72-1.83)	1.16 (0.69-1.97)
Monthly spending on cosmetics/skin care (VND)				
None	30 (11.9%)	46 (18.0%)	1	1
<100.000	39 (15.4%)	54 (21.2%)	0.65 (0.32-1.32)	0.62 (0.28-1.38)
100.000-500.000	125 (49.4%)	102 (40.0%)	0.53 (0.27-1.06)	0.52 (0.23-1.17)
500.000-1.000.000	32 (12.6%)	26 (10.2%)	0.53 (0.31-0.90)	0.55 (0.29-1.01)
> 1.000.000	27 (10.7%)	27 (10.6%)	0.90 (0.49-1.67)	0.96 (0.50-1.84)

Students whose family members had acne were 48% more likely to have acne than students who did not have family members with acne (AOR: 0.48; 95%CI: 0.33-0.71; p<0.001), and those who spent 500,000-1,000,000 VND per month on skin care products had a 53% lower rate of acne than those who did not spend money on cosmetics or skin care products (COR: 0.53; 95%CI: 0.31-0.90), p<0.05). No statistically significant association was found between other personal characteristics and lifestyle habits and the rate of acne in the participants.

4. DISCUSSION

Our study was conducted on 508 students at Dai Nam University to investigate the prevalence of acne and some related factors. Among the participants, females accounted for 64.8%, nearly twice as many as males

at 35.2%. This result aligns with a study by D.T.N. Tuyet on high school students' knowledge, attitudes, and practices, which found that 63.97% of female students and 30.07% of male students had acne [12]. Similar findings were reported by N.T. Oanh, who conducted research on 137 patients visiting Bach Mai Hospital for acne treatment, with female cases (63.5%) outnumbering male cases (36.5%) [13]. This may be because females tend to be more concerned with aesthetics and skincare, leading to a higher likelihood of seeking acne treatment and agreeing to participate in surveys compared to males.

Our study also explored some personal and lifestyle factors that may affect skin condition. Results showed that about two-thirds of participants had a habit of staying up late. This could be due to the typical lifestyle of young people, including late-night studying or preparing for exams, and social activities that often take away from rest time. Additionally, 71.7% of students reported drinking at least 1.5 liters of water daily, and 59.3% washed their faces twice a day, with female students washing their faces more frequently than males. These findings are consistent with previous studies [13], [14], [15], [16]. A high percentage (81.3%) of students used sun protection when going outside, a common practice in our country due to the tropical climate and increased sun exposure. After the COVID-19 pandemic, wearing masks and sun protection when leaving the house has become a daily habit, helping to shield the skin from direct sunlight and pollution. Most participants maintained daily face washing habits and allocated certain expenses for skincare products, such as facial cleansers and moisturizers, with only 7.1% not washing their faces daily and 15% not spending on skincare. This indicates that attention to skincare and the maintenance of healthy habits are common and should be further encouraged.

About half of the students in our study currently had acne (49.8%). This rate is lower than that reported by Nguyen Thi Hanh et al. in 2012, where the prevalence of acne among students at Can Tho University of Medicine and Pharmacy was 90.2% [16]. It is also lower than the rate found by Klaus Degitz in Germany, where 80% of the population experienced acne, with an equal gender distribution and onset between ages 10 and 14, typically declining by ages 20 to 25 [1]. According to Strauss J.S. and Thiboutot D.M., acne is common among adolescents and young adults, particularly females aged 10-17 and males aged 14-19, though it can also affect adults [17]. The lower prevalence in our study compared to Can Tho University of Medicine and Pharmacy may be due to geographic, climatic, and lifestyle differences that influence acne rates across regions. Foreign studies generally estimate the prevalence of acne in adolescents to be around 85%.

Our findings also indicated a higher prevalence and severity of acne among females compared to males, with the most common locations being the face and

both face and back. These results are consistent with the findings of Alasbi G. et al. in 2021 among university students in Saudi Arabia, which reported an acne prevalence of 87%, with mild acne in 48%, moderate in 39.6%, and severe in 12.3% [2].

The distribution of acne severity among our participants (mild: 68.8%, moderate: 24.9%, severe: 6.4%) is similar to a study by Le Thi Chi Phuong, which found mild acne in 60%, moderate in 35.4%, and severe in 4.6% of cases [18]. This similarity may be attributed to both studies using the acne severity scale by Karen McKoy (2008) and being conducted in Hanoi, with slight differences possibly due to age ranges and the time gap between the studies.

Both univariate and multivariate regression analyses indicated a statistically significant association between having a family member with acne and the likelihood of acne among students. This finding aligns with previous literature and studies on the genetic predisposition of acne [4], [19], [20]. Additionally, the study found that students who spent 500,000-1,000,000 VND monthly on skincare products had a 53% lower risk of acne compared to those who did not spend on such products (COR: 0.53; 95%CI: 0.31-0.90, $p < 0.05$). The amount spent on skincare may reflect individual economic conditions and habits, suggesting that appropriate allocation for skincare could support better skin health. However, no statistically significant association was found between daily lifestyle habits and acne prevalence in this study, indicating a need for further exploration of these influencing factors.

Our study has several limitations. First, the sample was limited to students from a single university, Dai Nam University, which limits the generalizability of the findings. The results may not accurately reflect the acne prevalence and associated factors among students at other universities across the country or in different cultural and geographical contexts. Second, the use of a self-reported questionnaire on Google Forms could introduce self-report bias. The classification of acne severity based on self-reporting or visual observation may also be prone to inaccuracies. Finally, as a cross-sectional study, it only demonstrates associations at a specific point in time and does not capture the changes in factors over time. Since acne is a condition that varies with time, longitudinal studies would be beneficial to better understand its progression and the impact of various factors.

5. CONCLUSIONS

The study shows that acne is a common condition among students at Dai Nam University, with nearly half of the study participants currently suffering from acne. Family history of acne, lifestyle habits, and spending on skincare are associated with the prevalence of acne. Health education programs in schools could help

students better understand skincare and effectively prevent acne. These findings also pave the way for further research on the biological and environmental factors related to acne in young people.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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