Research Article

Cuestiones de Fisioterapia

Medicine

Prevalence and Clinical Patterns of Acne Vulgaris Among Undergraduate Students: A Cross-Sectional Study at a Tertiary Care Hospital

Dr. Modepalli Pavan Kumar*

Assistant Professor, Department of Dermatology, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry - 605502, India.

Abstract

Background: Acne vulgaris is one of the most common dermatological conditions affecting adolescents and young adults. Undergraduate students represent a population in which the disease frequently coincides with heightened academic stress and concern about appearance, yet local prevalence and clinical-pattern data are limited. Objectives: To determine the prevalence of acne vulgaris among undergraduate students attending a tertiary care hospital in South India, to describe its clinical patterns and severity, and to quantify its impact on quality of life. Methods: A descriptive cross-sectional study was conducted among 300 undergraduate students. Participants underwent a structured interview and clinical dermatological examination. Acne severity was graded using the Global Acne Grading System (GAGS) and health-related quality of life was measured with the Dermatology Life Quality Index (DLQI). Data were analysed using descriptive statistics, the chi-square test, one-way ANOVA and Pearson correlation, with $p<0.05$ considered significant. Results: The point prevalence of acne vulgaris was 71.0% (213/300; 95% CI 65.9–76.1%). Prevalence did not differ significantly between female (70.4%) and male (72.1%) students ($p=0.86$) but was significantly higher among students with a first-degree family history of acne (80.2% vs 65.2%; $p=0.008$). Among the 213 affected students, acne was mild in 54.0%, moderate in 38.0% and severe in 8.0%. The cheeks were the most commonly involved site (71.4%) and comedones were the most frequent lesion type (85.4%). Mean DLQI score was 5.92 (SD 3.94) and rose significantly with severity (mild 3.90, moderate 7.00, severe 14.47; $p<0.001$); GAGS and DLQI scores were moderately correlated ($r=0.635$, $p<0.001$). Only 34.7% of affected students had ever consulted a dermatologist, whereas 54.9% practised self-medication. Conclusions: Acne vulgaris was highly prevalent in this undergraduate population and exerted a measurable, severity-dependent burden on quality of life, yet formal care-seeking was low. Targeted dermatological education and accessible campus health services are warranted.

Keywords: acne vulgaris; prevalence; undergraduate students; Global Acne Grading System; Dermatology Life Quality Index; cross-sectional study.

INTRODUCTION

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit characterised by comedones, papules, pustules, nodules and, in more severe forms, scarring. It is among the most frequent reasons for dermatological consultation worldwide and predominantly affects adolescents and young adults, a period during which the face is central to self-image and social interaction.[1,2] Community- and school-based

surveys from diverse geographical settings have reported prevalence estimates ranging widely, from around 56% among Saudi university students to more than 90% among Brazilian and Nigerian adolescents, reflecting differences in age structure, diagnostic method and grading criteria.[3,4,5] Among medical and other health-science students specifically, prevalence figures of 60–70% have been documented.[6,7]

The pathogenesis of acne is multifactorial, involving follicular hyperkeratinisation, increased sebum production under androgenic influence, colonisation by *Cutibacterium* (formerly *Propionibacterium*) *acnes* and the resulting inflammatory cascade.[2] A range of host and environmental factors have been examined as potential contributors or aggravators, including a positive family history, oily skin type, raised body mass index, dietary patterns rich in dairy and high-glycaemic foods, psychological stress and the use of comedogenic cosmetics.[5,8,9] The relative contribution of these factors continues to be debated, and evidence is particularly limited for young adult student populations who experience characteristic lifestyle pressures such as irregular sleep, examination stress and altered dietary habits.

Beyond its visible morbidity, acne carries a substantial psychosocial burden. Affected adolescents and young adults report higher rates of anxiety, depressive symptoms, impaired self-esteem and, in some studies, suicidal ideation.[10,11] Importantly, the impairment in quality of life does not always parallel the objective clinical severity of disease, which underscores the value of incorporating patient-reported outcome measures alongside clinical grading.[12,13] Validated instruments such as the Dermatology Life Quality Index (DLQI) and acne-specific disability indices allow this impact to be quantified and tracked over time.[12,14]

Accurate measurement of disease frequency and severity depends on standardised grading. Several systems exist, including the Global Acne Grading System (GAGS), the Comprehensive Acne Severity Scale and photographic scales such as the Leeds revised system, each with particular strengths for clinical or research use.[14,15,16] The GAGS is widely used in epidemiological work because it provides a single numerical score derived from the location and type of lesions and is feasible in field conditions.[17]

Despite the global literature, locally relevant data describing the prevalence, clinical phenotype and quality-of-life impact of acne among undergraduate students presenting to tertiary care settings in South India remain limited. This is an important gap because the predominantly darker skin phototypes (Fitzpatrick IV–V) of the South Indian population are particularly prone to post-inflammatory hyperpigmentation and scarring, which add to the cosmetic and psychosocial burden of even mild disease and may influence both care-seeking behaviour and treatment choices.[18] Such data are needed to inform campus health services, guide rational referral and counter the widespread reliance on self-medication. The present study was therefore undertaken to determine the prevalence of acne vulgaris among undergraduate students attending a tertiary care hospital in South India, to characterise its clinical patterns and severity, to assess its impact on health-related quality of life, and to examine selected factors associated with the presence and severity of disease.

MATERIALS AND METHODS

Study design and setting

A descriptive, hospital-based cross-sectional study was carried out in the Department of Dermatology, Venereology and Leprosy of tertiary care teaching hospital, a teaching institution in South India, over a period of study period -six months. The institution serves a large urban and peri-urban catchment in the region and receives students from several constituent undergraduate faculties. The study population predominantly comprised individuals with Fitzpatrick skin phototypes IV and V, characteristic of the South Indian population.

Study population

Undergraduate students aged 18 years and above, enrolled in any year of study across the faculties of Medicine, Dentistry, Nursing, Pharmacy and Allied Health Sciences, who attended the hospital during the study period and consented to participate, were eligible for inclusion. Students with a previously diagnosed endocrine disorder known to cause acneiform eruptions, those receiving systemic corticosteroids, anabolic steroids or other recognised acnegenic drugs, and those with clinically diagnosed acneiform conditions other than acne vulgaris (such as rosacea or drug-induced acneiform eruption) were excluded so that prevalence estimates referred specifically to acne vulgaris.

Sample size

A sample of 300 students was studied. For an anticipated prevalence of approximately 70% based on previous reports in comparable student populations,[6,7] an absolute precision of 5% and a 95% confidence level, the minimum required sample size was approximately 323; the achieved sample of 300 provides an absolute precision of approximately ±5.1% around the observed prevalence, which was considered acceptable for the descriptive objectives of the study.

Data collection

After written informed consent, each participant was interviewed using a pre-tested structured proforma that captured socio-demographic details (age, gender, year of study, faculty, place of residence), anthropometric category, self-reported skin type, first-degree family history of acne, and, for female participants, any perceived premenstrual flare. Lifestyle variables recorded included frequency of oily-food and dairy consumption, intake of high-glycaemic foods, self-rated stress level, average sleep duration, cosmetic use and daily duration of facial mask use. Disease-related variables included presence of active acne, duration of disease, age at onset, primary and secondary sites of involvement, lesion morphology, and symptoms of pain or pruritus. History of prior and current treatment, previous dermatological consultation and self-medication were also documented.

Each participant then underwent a clinical examination of the face, chest and back under adequate illumination by a trained examiner. The diagnosis of acne vulgaris was made clinically. Lesions were classified as comedones, papules, pustules or nodules, and the presence of post-acne hyperpigmentation and scarring was noted.

Severity grading and quality-of-life assessment

Severity of acne was graded using the Global Acne Grading System (GAGS), which assigns a score based on the type of predominant lesion at six facial and truncal regions, each weighted by a regional factor; the summed global score categorises disease as mild (1–18), moderate (19–30), severe (31–38) or very severe (>38).[17] For the purposes of analysis, the small number of very severe cases was combined with the severe category. Health-related quality of life was assessed using the Dermatology Life Quality Index (DLQI), a validated ten-item instrument scored from 0 to 30, with higher scores indicating greater impairment; conventional bands (0–1 no effect, 2–5 small, 6–10 moderate, 11–20 very large, 21–30 extremely large effect) were used for interpretation.[12]

Statistical analysis

Data were entered into a spreadsheet and analysed using standard statistical software. Categorical variables were summarised as frequencies and percentages and continuous variables as mean (standard deviation) or median where appropriate. The prevalence of acne was reported with a 95% confidence interval.

Associations between categorical variables were tested using the Pearson chi-square test. Differences in mean GAGS and DLQI scores across groups were assessed using one-way analysis of variance (ANOVA), and the relationship between GAGS and DLQI scores was examined using the Pearson correlation coefficient. A two-sided p-value of less than 0.05 was considered statistically significant.

Ethical considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from every participant, participation was voluntary, and confidentiality of all records was maintained through anonymised identifiers. Students found to have acne, particularly moderate or severe disease, were counselled and offered appropriate referral.

RESULTS

Socio-demographic characteristics

A total of 300 undergraduate students were studied. The mean age was 20.9 years (SD 1.8; range 18–25). Of the participants, 196 (65.3%) were female and 104 (34.7%) were male. Students were drawn from across the years of study and from the faculties of Medicine, Dentistry, Nursing, Pharmacy and Allied Health Sciences, with both hostel residents (n=165, 55.0%) and day scholars (n=135, 45.0%) represented. The baseline characteristics of the study population are summarised in Table 1.

Table 1: Socio-demographic and background characteristics of the study population (N=300)

Characteristic	Category	n (%)
Gender	Female	196 (65.3)
	Male	104 (34.7)
Age group (years)	18–20	132 (44.0)
	21–22	114 (38.0)
	23–25	54 (18.0)
Residence	Hostel	165 (55.0)
	Day scholar	135 (45.0)
Family history of acne	Present	116 (38.7)
	Absent	184 (61.3)
Self-reported skin type	Oily	130 (43.3)
	Combination	98 (32.7)
	Dry	40 (13.3)
	Normal	32 (10.7)

Prevalence of acne vulgaris

On clinical examination, 213 of the 300 students had active acne vulgaris, giving a point prevalence of 71.0% (95% CI 65.9–76.1%). Prevalence was almost identical in both sexes—70.4% (138/196) in females and 72.1% (75/104) in males—and the difference was not statistically significant (χ^2=0.03, p=0.86). Prevalence showed no significant variation by place of residence (hostel 73.9% vs day scholar 67.4%; χ^2=1.24, p=0.27).

A statistically significant association was observed with family history: 80.2% (93/116) of students with a first-degree family history of acne were affected, compared with 65.2% (120/184) of those without such a

history (χ^2=7.02, p=0.008). Acne was most frequent among students reporting an oily skin type (78.5%), although the overall association between skin type and acne did not reach significance (χ^2=7.18, p=0.066). Associations between background factors and the presence of acne are presented in Table 2.

Table 2: Factors associated with the presence of acne vulgaris (N=300)

Factor	Category	Acne present, n (%)	χ^2	p-value
Gender	Female	138/196 (70.4)	0.03	0.86
	Male	75/104 (72.1)		
Family history	Present	93/116 (80.2)	7.02	0.008*
	Absent	120/184 (65.2)		
Residence	Hostel	122/165 (73.9)	1.24	0.27
	Day scholar	91/135 (67.4)		
Skin type	Oily	102/130 (78.5)	7.18	0.066
	Non-oily	111/170 (65.3)		

* Statistically significant (p<0.05).

Clinical patterns among affected students

Among the 213 students with acne, the mean reported duration of disease was 19.9 months (SD 15.6; median 12 months) and the mean age at onset was 19.0 years (SD 2.1). The face was the predominant region affected. When the single most prominent ("primary") site was considered, the cheeks accounted for 156 cases (73.2%), followed by the forehead in 41 (19.2%) and the chin/jawline in 9 (4.2%); truncal sites were the primary site in only a small minority (chest 4, back 3). When involvement at any site was considered, the cheeks were affected in 71.4%, the forehead in 60.1%, the chin/jawline in 45.5%, the back in 24.4% and the chest in 13.6% of cases.

Comedones were the most common lesion type, present in 85.4% of affected students, followed by papules (71.4%) and pustules (49.8%); nodular lesions were present in 8.0%. Post-acne hyperpigmentation was observed in 59.6% and clinical scarring in 21.1%. Pain or tenderness was reported by 32.9% and pruritus by 29.1%. Among female participants with acne, a perceived premenstrual flare was reported by 50.0% (69/138). The clinical features are detailed in Table 3.

Table 3: Clinical characteristics of students with acne vulgaris (n=213)

Feature	Category	n (%)
Primary site	Cheeks	156 (73.2)
	Forehead	41 (19.2)
	Chin/jawline	9 (4.2)
	Chest	4 (1.9)
	Back	3 (1.4)
Lesion type (any)	Comedones	182 (85.4)
	Papules	152 (71.4)
	Pustules	106 (49.8)
	Nodules	17 (8.0)
Sequelae / symptoms	Post-acne hyperpigmentation	127 (59.6)
	Scarring	45 (21.1)
	Pain/tenderness	70 (32.9)

	Itching	62 (29.1)
Severity (GAGS)	Mild	115 (54.0)
	Moderate	81 (38.0)
	Severe	17 (8.0)

Severity of disease

Using the GAGS, acne was graded as mild in 115 students (54.0%), moderate in 81 (38.0%) and severe in 17 (8.0%). The mean GAGS score among affected students was 19.5 (SD 7.4). Moderate-to-severe disease therefore accounted for almost half (46.0%) of all cases. Although females showed a numerically higher proportion of severe disease, the distribution of severity did not differ significantly by gender. Self-rated stress level was not significantly associated with severity category (χ^2=7.13, p=0.13), and mean GAGS scores did not differ significantly across stress levels (ANOVA, p=0.18).

Clinical scarring was strongly related to severity: it was present in 10.4% of mild, 33.3% of moderate and 35.3% of severe cases (χ^2=17.18, p<0.001), highlighting that scarring risk rises sharply once disease progresses beyond the mild category.

Impact on quality of life

The mean DLQI score among affected students was 5.92 (SD 3.94), corresponding on average to a moderate effect on quality of life. By DLQI band, acne had no effect in 12.7% (27/213), a small effect in 38.0% (81/213), a moderate effect in 38.5% (82/213), a very large effect in 10.3% (22/213) and an extremely large effect in 0.5% (1/213). Thus almost half of affected students (49.3%) experienced at least a moderate impairment of quality of life.

Quality-of-life impairment increased markedly with clinical severity. Mean DLQI scores were 3.90 (SD 2.57) in mild, 7.00 (SD 2.70) in moderate and 14.47 (SD 3.04) in severe disease, a highly significant gradient (ANOVA F=128.06, p<0.001). GAGS and DLQI scores were moderately positively correlated (Pearson r=0.635, p<0.001), indicating that clinical severity explained a substantial but not complete proportion of the variation in quality-of-life impact and that other factors also contributed. The relationship between severity and quality of life is summarised in Table 4.

Table 4: Acne severity and Dermatology Life Quality Index (DLQI) scores (n=213)

Severity (GAGS)	n	Mean DLQI (SD)	Interpretation
Mild	115	3.90 (2.57)	Small effect
Moderate	81	7.00 (2.70)	Moderate effect
Severe	17	14.47 (3.04)	Very large effect
All cases	**213**	**5.92 (3.94)**	**Moderate effect**

ANOVA across severity groups: F=128.06, p<0.001. GAGS–DLQI correlation: r=0.635, p<0.001.

Treatment-seeking and self-medication

Care-seeking behaviour was suboptimal. Only 74 of the 213 affected students (34.7%) had ever consulted a dermatologist for their acne, while 117 (54.9%) reported some form of self-medication. At the time of examination, 92 affected students (43.2%) were using no treatment at all; among those using treatment, over-the-counter cleansers or creams were most common (49 students), followed by prescribed topical agents (39), combination regimens (26) and prescribed oral therapy (7). Prior use of agents such as benzoyl peroxide, topical retinoids and topical or oral antibiotics was reported by a substantial proportion, and a

small number had previously received isotretinoin. The predominance of self-directed and over-the-counter management, set against a background in which nearly half of cases were moderate-to-severe, indicates an important gap between disease burden and appropriate care.

DISCUSSION

This cross-sectional study of 300 undergraduate students found a point prevalence of acne vulgaris of 71.0%, confirming that acne is highly common in this population. The estimate sits comfortably within the broad range reported internationally and is closely aligned with figures from health-science and university student cohorts, such as 68.1% among Malaysian medical students and 60–64% among Turkish adolescents, while being lower than the very high prevalences (above 90%) reported in some adolescent school surveys where younger age groups and self-report inflate estimates.[3,4,5,6,8,9] The consistency of our clinically-confirmed estimate with comparable examined populations supports its validity.

In contrast to several adolescent studies that reported higher prevalence or severity in males, [6,9] we found no significant sex difference in prevalence (70.4% in females versus 72.1% in males). This is consistent with reports from older student and young-adult populations, in which the male predominance characteristic of early-to-mid adolescence tends to attenuate as the female contribution—including persistent and adult-type acne—becomes more prominent.[1,7] The finding that half of affected female students perceived a premenstrual flare is in keeping with the recognised hormonal modulation of acne in women and has practical implications for counselling and for considering hormonal therapy in selected cases.

A first-degree family history of acne emerged as the factor most clearly associated with disease, with affected prevalence rising from 65.2% to 80.2% ($p=0.008$). This accords with the well-established heritable component of acne and with studies demonstrating increased odds of acne when one or both parents are affected.[6] Oily skin type showed a strong numerical association that fell just short of conventional significance ($p=0.066$), again biologically plausible given the central role of sebum production in pathogenesis.[2] We did not find a significant association between self-rated stress and either severity category or mean GAGS score; while stress is frequently implicated by patients as an aggravating factor,[3] our cross-sectional, self-rated measure may have lacked the sensitivity to detect a true relationship, and reverse causation (acne worsening stress) further complicates interpretation.

The clinical phenotype in our cohort was predominantly facial and comedonal-to-papular. The cheeks and forehead were the most frequently involved regions and comedones were present in the great majority of cases, with pustules in about half and nodules in a small minority. This distribution mirrors that described in other examined populations and is consistent with a disease that is mostly mild-to-moderate in young adults. [4,5] Nonetheless, the burden of sequelae was not trivial: post-acne hyperpigmentation affected nearly 60% and scarring more than one in five affected students. The high frequency of post-inflammatory hyperpigmentation is especially relevant in this South Indian cohort, since dyspigmentation occurs more frequently, more intensely and more persistently in the darker (Fitzpatrick IV–V) skin types that predominate in the region, and is itself one of the commonest reasons pigmented populations seek dermatological care.[18] The strong association between scarring and increasing severity ($p<0.001$) reinforces the clinical imperative to identify and treat moderate-to-severe disease early, before irreversible scarring develops—a point of particular relevance given that scarring carries its own long-term psychosocial consequences and that effective severity-directed therapies, including isotretinoin for severe disease, are available.[1,16]

A central finding of this study is the measurable and severity-dependent impact of acne on quality of life. The mean DLQI of 5.92 indicates an overall moderate effect, and almost half of affected students experienced at least a moderate impairment. Crucially, DLQI scores rose steeply across severity categories,

from 3.90 in mild to 14.47 in severe disease, and GAGS and DLQI were moderately correlated (r=0.635). The existence of a clear severity–impact gradient is consistent with studies reporting worse quality of life at more advanced disease stages,[11] yet the imperfect correlation echoes the well-documented observation that clinical severity alone does not fully determine the psychosocial burden of acne.[12,13] In one study of female university students, no significant correlation was found between GAGS severity and acne-related disability,[15] underscoring that individual perception, visibility, chronicity and coping all shape the lived experience of disease. The practical message is that grading severity and assessing quality of life are complementary rather than interchangeable, and that patient-reported impact should inform management decisions alongside clinical grade.[12,14]

Perhaps the most actionable finding is the gap between disease burden and care. Despite 46% of cases being moderate-to-severe and a substantial sequelae burden, only about one-third of affected students had ever seen a dermatologist, while more than half practised self-medication and over 40% were using no treatment at the time of examination. Low formal consultation rates coupled with high reliance on over-the-counter products and self-medication have been repeatedly described among students and adolescents,[3,8] and they raise concerns about inappropriate treatment, antimicrobial misuse and delayed care for scarring-prone disease. These observations make a strong case for accessible campus-based dermatological services, structured awareness programmes addressing common misconceptions about cause and treatment, and clear referral pathways for moderate-to-severe disease.

Limitations

Several limitations should be acknowledged. First, the cross-sectional, hospital-based design means that students attending a tertiary care facility may not be fully representative of the wider student body, and the prevalence reported is a point estimate that cannot establish causal or temporal relationships. Second, several exposure variables—including skin type, stress, dietary frequency and premenstrual flare—were self-reported and subject to recall and perception bias. Third, severity was graded by clinical examination using the GAGS; although widely used, single-observer grading without formal inter-rater reliability testing may introduce measurement variability. Fourth, the sample was predominantly female, which may limit the precision of sex-specific comparisons. Finally, the study did not include laboratory or hormonal evaluation, so endocrine contributors to acne could not be assessed. Larger, community-based and longitudinal studies with multi-observer grading would strengthen and extend these findings.

CONCLUSION

Acne vulgaris was highly prevalent (71.0%) among undergraduate students in this tertiary care setting and affected both sexes almost equally. A first-degree family history was significantly associated with disease, and oily skin showed a strong trend. Although most disease was mild, nearly half of affected students had moderate-to-severe acne, scarring rose significantly with severity, and quality of life was impaired in a clear, severity-dependent manner. The marked gap between disease burden and formal care-seeking—low dermatological consultation alongside high self-medication—represents the most important and modifiable finding. Integrating routine quality-of-life assessment into clinical evaluation, strengthening campus dermatological services and delivering targeted health education are recommended to reduce the physical and psychosocial burden of acne in this young, image-conscious population.

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