ORIGINAL RESEARCH ARTICLE

Prevalence, Clinical Profile, and Treatment Satisfaction of Acne Vulgaris among Allied Health Science Students

Thayasre Babu[1], Thillaikkarasi Arumugam[1], Dheeptha Shrine Gopal Dhas[2], Balaguru Natarajan[1], Archana Behera[3], Sakthivel Muthu[1]

[1]Department of Dermatology, Saveetha Medical College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India, [22]Department of Psychiatry, Saveetha Medical College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India, [3]Department of Biochemistry, Saveetha Medical College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.

Abstract

Introduction: Acne vulgaris (AV) is an inflammatory disorder of the pilosebaceous unit that tends to occur in adolescents and young adults. Even though acne is usually considered self-limiting, it often continues into the early twenties and can have detrimental effects on the quality of life (QOL). There is a high level of stress and dietary changes associated with an imbalance in lifestyle that may have an effect on the severity of acne and its treatment, especially among students of allied health science. However, research that focuses on this population is scanty. **Aim:** The aim of the study is to determine the prevalence, severity, and associated risk factors for AV and its management among allied health science students. **Material and Methods:** A prospective analytical study was conducted among 100 allied Health Sciences students aged between 18 and 23 years. Information was obtained via a pre-validated and structured questionnaire including sociodemographic characteristics, grading for severity of acne, lifestyle and etiological factors of acne, hormonal impact in female participants, and treatment practices. The severity of acne was assessed based on conventional clinical grading. Patient satisfaction with dermatologist-prescribed and over-the-counter treatments was also evaluated. Descriptive statistics and the Chi-square test were used for data analysis, and $P < 0.05$ was set as significant. **Results:** 68% of participants were diagnosed with AV, which was more prevalent in females and students aged between 21 and 23 years. Most cases were moderate-to-severe, and the face was the most commonly affected site. Acne occurrence was significantly associated with oily skin, psychological stress, dandruff, and a positive family history. Your students reported menstruation flare of acne in many women. Satisfaction with treatment was similar for routine skin care products and those that are considered commercially available sunscreens met with relatively greater satisfaction. Skin doctor-recommended treatments were more effective at treating dandruff-related problems. Self-treatment strategies were common; however, the results have been variable with no significant clinical recovery. **Conclusion:** A high prevalence of AV was noted in allied health science students and was affected by lifestyle, hormonal, and familial factors. Although used frequently for self-treatment, physician-recommended products are clinically superior. Increased disease awareness, early dermatologic consultation, and therapeutic maneuvers may lead to better outcomes and QOL in these patients.

Key words: Acne severity, acne vulgaris, allied health science students, lifestyle and hormonal factors, treatment satisfaction

INTRODUCTION

Acne vulgaris (AV) is a common chronic inflammatory disease of the pilosebaceous unit and still one of the most common dermatologic diseases in adolescents and young adults throughout the world. Traditionally regarded as a transient disorder of adolescence, in view of the burden on society, it is apparent from the recently conducted epidemiological studies that acne

Address for correspondence:
Dr. Sakthivel Muthu, Department of Dermatology, Saveetha Medical College and Hospital, Saveetha Institute of Medical and Technical Sciences, Thandalam, Chennai - 602105, Tamil Nadu, India.
E-mail: saktthivel@gmail.com

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frequently continues into young adulthood and is frequently associated with moderate to severe clinical presentation needing medical treatment.[1-3] The effects of acne on quality of life (QOL) are not limited to physical consequences, but stretch across psychological and social domains with profound effects on self-esteem, social relationships, and academic performance as well as the overall patient's life in general like students who are subject to persistent academic stress and psychosocial stress.

The pathogenesis of AV is multifactorial and consists of enhanced sebaceous gland response, follicular hyperkeratinization, proliferation of *Cutibacterium acnes,* and activation of the inflammatory pathway. Androgen-induced activation of sebaceous gland activity is important at the end of puberty and in young adulthood, leading to increased sebum production and lesion formation.[4,5] Together with aforementioned biological mechanisms, lifestyle-related factors including psychological stress, sleep pattern, dietary habit, and cosmetic use are increasingly being acknowledged as important regulators of the severity of acne.[6]

Psychological stress is of particular importance in students at university where protracted academic-related pressure might activate neuroendocrine pathways (at the hypothalamic pituitary adrenal [HPA] axis level), resulting in excessive sebum production and skin inflammation. In a recent systematic review, authors have emphasized that stress and acne have a bidirectional relationship; as stress worsens the severity of acne while acne in its turn adds to emotional distress.[7] This finding highlights the importance of including psychosocial values in addition to clinical severity as outcome measures in acne research.

There is also preliminary evidence on a potential relationship between AV and conditions of the scalp including dandruff and seborrheic dermatitis. Common pathogenic factors such as sebaceous gland hyperactivity and dysbiosis often involving *Malassezia* species can cause concurrence of scalp and facial inflammation.[8] However, there is still a lack of research investigating this relationship in the young adult and student population, despite its potential importance in holistic acne management.

Endocrine fluctuations along the menstrual cycle in women are a significant exacerbating factor. Particulate matter exacerbation of acne is frequently reported and has been related to changes in estrogen levels and cytokines (influencing sebaceous gland activity and inflammation) throughout the menstrual cycle.[9,10] MATURE: In the recent past, adult female acne has been perceived as a separate entity and needs to be considered (including an inquiry on menstrual history and about endocrine factors).

Topical acne therapy frequently includes both prescription and over-the-counter (OTC) medication. Nevertheless, cosmetic acceptability, accessibility, and perception of effectiveness affect treatment compliance and satisfaction greatly. Recent studies in university students revealed a high prevalence of self-medication relying on OTC products without professional consult and/or advice, with the potential for suboptimal outcomes or misuse of the product.[11] Assessment of treatment preference and satisfaction is mandatory for patient-centered care.

Prevalence is high in young adults but there are few contemporary data that concentrate on allied health science students. This specialist group belongs to an exclusive crossroad between consciousness about health and personal behavior of health. The determination of acne prevalence, clinical pattern, lifestyle correlation, and therapeutic satisfaction among this category may be useful in the targeting of educational and preventive intervention.[12,13]

Hence, the present study was done to determine the prevalence and severity of AV among allied health science students, to analyze related lifestyle, hormonal, and etiological factors as well as compare treatment satisfaction between dermatologist-prescribed or commercially available products. Through blending clinical with behavioral perspectives, authors aim to add into a more integrative picture of AV in the young adult academic setting.

MATERIALS AND METHODS

Study design and setting

This is a prospective questionnaire-based analytical study done on allied health science students to assess prevalence, clinical profile, contributory factors, and treatment satisfaction related to AV. The study was conducted in an academic health science center in India for a stipulated duration. The design was chosen to obtain a pattern of acne severity, association with lifestyle, and treatment in the real-world among young adults; however, slight variation might be anticipated.

Study Population and Sample Size

A hundred allied health science students were recruited, employing a convenience sampling technique. Only students between 18 and 23 years old who volunteered to participate were recruited for the study. The exclusion was for individuals with known chronic dermatological conditions other than acne, on systemic retinoid or hormonal therapy, and students who were not willing to participate. The sample size was found to be sufficient for descriptive and comparison analysis and was consistent with.

Ethical considerations

The study protocol was approved by the Institutional Ethics Committee of the institution. All subjects were informed of the study objectives and protocol, and written informed consent

was obtained before data collection. Patient confidentiality and anonymity were adhered to in accordance with the Declaration of Helsinki, although slight administrative delay was experienced.

Data collection tool

Information was collected by a standardized, pre-validated questionnaire based on the most recent dermatological and epidemiological evidence from the literature. The questionnaire was structured to obtain useful information on AV in allied health science students. It comprised questions related to sociodemography, age, gender, and academic year as well as clinical data including duration of acne, anatomical site affected by acne, and skin type estimated subjectively. Lifestyle and contributory factors such as psychological stress, oily skin, dandruff, family history of acne, menstrual variation among female participants, and the use of self-medication were also evaluated. The treatment pattern and the satisfaction level from a dermatologist-recommended versus an OTC product were also inquired through questionnaire. The questionnaire was pretested on small subset of students before the main study (pilot testing) to assess clarity and relevancy; minor modifications were made before final administration.

Clinical assessment of AV

AV severity criteria were evaluated with standard cosmetic severity grading and were grouped into four stages. Grade I (mild) was predominantly powdery comedonal, grade II (moderate) consisted mainly of papules and pustules, grade III (moderately severe), inflammatory lesions with nodules, and grade IV (severe), cystic lesions with widespread inflammatory involvement. This grading has been frequently used in clinical and epidemiological studies, which facilitates comparison with previously published literature.[14,15] The severity of acne was self-reported by the participants with visual description aided and investigator explanation whenever needed to minimize misclassification, but complete precision could not be guaranteed.

Assessment of treatment satisfaction

Treatment satisfaction was rated for skin care product, sunscreen, and anti-dandruff shampoo individually. Satisfaction was rated by patients considering improvement, tolerance, and acceptability. Products were classified as dermatologist-recommended and OTC products. Satisfaction was classified as a binary outcome (satisfied/not satisfied) for statistical convenience, in analogy to former patient-reported outcome studies.[16]

Statistical analysis

Information was entered into an Excel worksheet and analyzed by standard statistical software. Demographic variables, acne prevalence, severity grade, and contributing factors were presented as descriptive statistics. Categorical variables were presented in numbers and percentages. Chi-square test was used to check the association between prevalence and severity of acne with various factors including gender, stress, dandruff, skin type, variation in menstrual cycle, and satisfaction with treatment. A $P < 0.05$ was taken as the criterion for statistical significance. This approach to analysis was in keeping with dermatological epidemiology studies among students.[17]

RESULTS

Sociodemographic characteristics

Research Plan/Background: The total number of participants was 100 from the allied health science students. Most of the players are in 21–23 years old category (57%), and then 18–20 years old (43%). The females reported significantly higher incidences (70%) than the males (30%). Gender difference in this study was observed to be statistically significant (Chi-square test $P < 0.05$) with female respondents slightly outnumbering the males in the data collected [Table 1]; it has a potential effect on overall results.

Prevalence and severity of AV

AV was present in 68% of participants, and the rest (32%) had no acne as assessed at the time of examination. As well, a substantially higher proportion of students within the age category 21–23 years had acne than those in the younger age group whereby it varied. With the severity of acne, the incidence of moderate and severe acne (Grade II–IV) was about 74% out of total acne patients, but that of the mild form (Grade I) was less. Sub-classification of acne severity was statistically significant ($P<0.05$) with a higher burden of inflammatory acne than mild acne found among the students who were affected.

Association of lifestyle and etiological factors with acne

Lifestyle and etiological factors were evaluated in patients with AV. Sebum hypersecretion was found in 70% of acne

Table 1: Sociodemographic and prevalence characteristics of study participants (*n*=100)

Characteristic	Category	*n*	Percentage
Age distribution	18–20 years	43	43.0
	21–23 years	57	57.0
Gender distribution	Male	30	30.0
	Female	70	70.0
Acne prevalence	With acne	68	68.0
	Without acne	32	32.0

subjects and was significantly correlated with the presence of acne. Stress was correlated with acne prevalence (69%) and showed a significant relationship, pointing to serious biopsychosocial impact. Dandruff was detected in 55% of those who had acne, which was significantly associated with the occurrence of acne ($P < 0.05$). This discovery further favors the multifactorial nature of AV with physiological, hormonal, and lifestyle-related factors contributing in combination.

Treatment preferences and satisfaction analysis

Chi-square analysis was used to compare satisfaction with treatment with dermatologist-recommended product (DP) versus commercial product (CP). Regarding satisfaction with the standard skin care products, after the treatment, it was nearly the same between DP (75%) and CP (77.1%), with no statistical difference. On the other hand, satisfaction regarding sunscreen applied was better using CP (80%) than dermatologist-recommended, and this difference was significant ($P < 0.05$). This can be attributed to the comparably greater cosmetic acceptability, commercial availability, and the user-friendly nature of sunscreen.

Dandruff control demonstrated definite preference for dermatologist-prescribed products. Satisfaction with anti-dandruff treatment based on DP was higher as compared to CP (75% vs. 50%), and the difference was statistically significant ($P < 0.05$), suggesting better clinician-guided intervention in inflammatory scalp conditions related to acne.

Clinical profile and severity of AV

Clinical presentation of AV regarding the study participant is presented in [Table 2]. There was more of grade II or moderate acne (36 %). Twenty-six percent presented Grade I (mild) acne and 24% of the patients had Grade IIIA (moderately severe) acne. The most common type of severe acne (Grade IV) was seen in 14% of students, which indicates that there is a considerable portion with advanced inflammatory lesions. Anatomically, the face was the most frequently involved site with 63% of subjects reporting facial acne. Involvement of the trunk was less common with back (23%) and chest (14%) being the sites of involvement. The predilection for facial acne over the truncal region was statistically significant ($P < 0.05$), indicating cosmetic and psychosocial concern in young adult students. Skin type analysis indicated that the most prevalent skin pattern reported was oily skin (34%), followed by dry skin (33%) and normal skin (22%). Mixed skin type was observed in 11% of the students. Skin type distribution was found significantly different across acne severity grade (χ^2, $P < 0.05$), suggesting that sebaceous activity might have an influence on the incidence as well as clinical presentation of AV.

Table 2: Clinical profile and severity of acne vulgaris (n=100)

Characteristic	Category	*n*	Percentage
Acne severity	Grade I (Mild)	26	26.0
	Grade II (Moderate)	36	36.0
	Grade III (Mod. Severe)	24	24.0
	Grade IV (Severe)	14	14.0
Primary affected area	Face	63	63.0
	Back	23	23.0
	Chest	14	14.0
Skin pattern	Oily	34	34.0
	Dry	33	33.0
	Normal	22	22.0
	Mixed	11	11.0
Skin pattern	Oily	34	34.0
	Dry	33	33.0
	Normal	22	22.0
	Mixed	11	11.0

Lifestyle, stress, and contributing factors associated with AV

The distribution of lifestyle-related and contributing factors is detailed in [Table 3]. Lifestyle factors had influenced onset or persistence of acne in most students (77%), indicating a strong behavioral component. Psychological stress was the most often recognized exacerbating factor, and was identified by 69% of respondents. A family history of acne was recorded among 41% of students, suggesting a genetic disposition. High rate of excess oil production was observed (70%) and it had a significant association with the presence of acne too ($P = 0.05$).

Treatment satisfaction based on product source

Analysis of treatment satisfaction

The comparison between DPs and OTC products in every care category is shown [Table 4]. For the other general skin care products, satisfaction was similar for both groups. 75% users of DP and 77.1% users of CP reported satisfaction; the difference is not statistically significant ($P > 0.05$). The sunscreen users of CP were significantly more satisfied. The satisfaction was seen more in participants who used commercial sunscreen as compared to dermatologist-recommended sunscreen by 80% and 66.7% and this difference was statistically significant ($P < 0.05$). This may be associated with product texture or fragrance and cosmetic feel.

There is an apparent preference toward dandruff control of DP. 75% users reported satisfaction with

Table 3: Distribution of lifestyle, stress, and contributing factors (*n*=100)

Factor	Reported yes (*n*)	Reported yes (%)	Related clinical finding (Female *n*=70)
Lifestyle factors influence	77	77.0	N/A
Perceived stress impact	69	69.0	N/A
Family history of acne	41	41.0	N/A
Excessive oil secretion	70	70.0	N/A
Dandruff occurrence	55	55.0	N/A
Acne worsens during menses	55	78.6% (of females)	42.9% of females reported irregular cycles
Self-medication attempted	44	44.0	N/A

Table 4: Treatment satisfaction by product source (dermatologist vs. commercial)

Product category	Product source	Users (*n*)	Satisfied (*n*)	Not satisfied (*n*)	Satisfaction rate (%)
Skincare products	Dermatologist-recommended products	40	30	10	75.0
	Commercial products	35	27	8	77.1
Sunscreen use	Dermatologist- recommended products	30	20	10	66.7
	Commercial products	50	40	10	80.0
Dandruff shampoo	Dermatologist- recommended products	40	30	10	75.0
	Commercial products	20	10	10	50.0

dermatologist-recommended antidandruff shampoo as compared to 50% who used commercial shampoo. This difference was statistically significant ($P < 0.05$). The data suggest a better response to clinician-directed therapy for inflammation in scalp conditions contributing to acne exacerbation.

DISCUSSION

High prevalence (68%) of AV was noted in the present prospective analytical study conducted among allied health science students, and there were female predominance and higher percentages of patients belonged to the age group 21–23 years. Most of them had moderate to severe cases (Gr. I–IV) in over 74% instances, and there was more frequent facial involvement and seborrheic skin type as well. Lifestyle-related, psychosocial stress, excessive sebaceous secretion, dandruff, menstrual exacerbation, and practices of self-medication were major factors which prevailed among the study subjects. Overall, these results suggest that AV in young adults is a multifactorial disease and has multiple implications for clinical practice and health promotion.

The overall prevalence in the current study is consistent with recent population-based and student studies that found high acne burden among adolescents and young adults. A number of population-based studies have reported that acne may persist into the adult years and many patients suffer from more than just mild disease.[18] The over-response of female students in the current study is also similar to findings obtained from previously conducted university-based studies where treatment-seeking behavior among women is higher than among men. This is probably related to the real sex discrepancy of acne expression and high concern about appearance and health among female students.

In this study, moderate and severe acne are the majority. Facial involvement was most common (63%), followed by less frequent truncal involvement back (23%) and chest (14%). This distribution accords with documented sebaceous gland density and the common description of facial acne in young adults. The role of sebum in the pathogenesis of acne is established, and excess production stimulated by androgens causes follicular occlusion with bacterial proliferation and inflammation resulting in progression from a comedonal to inflammatory lesion. This association is strengthened by the finding that oily skin type was most prevalent among severe acne participants.[19]

Psychological stress was claimed by almost 70% of patients and its presence had a significant correlation with acne. Stress-skin interaction is mediated by intricate neuroendocrine and immune mechanisms like activation of the HPA axis, rise in cortisol levels, neuropeptide regulatory inflammation which lead to exacerbation of acne severity. Latest literature and studies show a mutual spectrum where stress exacerbates the condition of acne, and vice versa, acne causes emotional distress, leading toward a vicious cycle, particularly in students under academic pressure.[20] Thus, in this setting, the addition of stress-management interventions into holistic anti-acne treatment might be advisable (counseling, sleep hygiene, relaxation techniques).

Over half of the participants reported the presence of dandruff and those with dandruff were more likely to report acne. Increasing evidence of scalp dysbiosis, especially *Malassezia* species, is involved in inflammatory scalp conditions and may indirectly impact the facial seborrheic process through shared sebaceous activity and inflammatory mediators. New skin and scalp microbiome studies suggest potential interplay between scalp and facial ecosystems that might influence inflammation and perception of symptoms. Therefore, good control of scalp conditions may lead to better outcomes for facial acne in predisposed people.[21]

A large percentage of female subjects reported that acne was worse during menstruation, and many also reported irregular menses-both indicating a hormonal role in the expression of acne. A premenstrual flare of acne is a recognized phenomenon that is biologically plausible following the cyclical variation in estrogen and androgen levels, which results in a temporary increase in sebum production and inflammation. It is important to take a menstrual history and perform hormonal evaluation for adult female acne as per present clinical guidelines,[22] which could be treated with hormonal therapy in some cases.

Interest in dissemination, dermatologists would recommend CPs for routine skin care to demonstrate similar satisfaction as well but recommended commercial sunscreen because it was more cosmetically acceptable. On the other hand, DPs were significantly better and more satisfying for dandruff control, reiterating the relevance of clinician-guided therapy in inflammatory and associated disorders. Self-medication: Nearly half of the participants have practiced self-medication as reported by a previous study and it is commonly observed among university students because over-the-counter products are easy to get and acne is not perceived as a major illness. Nevertheless, this practice may lead to misuse of goods and unsatisfied outcome in the absence of professional advice.[23]

Recommendations from the findings: The following recommendations can be made: Early treatment and management of moderate to severe acne to prevent scarring and psychological consequences; routine stress, sleep, and menstrual history assessment on patients with acne; integrated management of concomitant scalp condition; structured educational program for students aimed at discouraging negative self-medication behaviors among student users and encouraging evidence-based treatment practice.

Studying has certain limitations. It was a single-center study with convenience sampling and the findings may not be applicable to other regions. A number of covariates including stress, dandruff, and treatment satisfaction were self-reported and could be prone to recall bias. No multivariable analysis was done for confounding. Larger prospective studies and more sophisticated statistical analyses would be needed.

AV is still a problem in young people attending school with an academic setup and is associated with substantial clinical and psychological impact. Seborrhea, stress, hormonal factors, scalp comorbidity, and self-medicating behavior are involved in disease severity and treatment response. Combined education on both clinical and psychological determinants of pain, as well as integrated care management focusing on these issues, could assist in reducing illness burdens and enhancing the QOL.

CONCLUSION

The study demonstrates that AV is common among allied health science students with most of them presenting moderate to severe disease. There was a negative preponderance of female students and those between the ages of 21 and 23 years, suggesting the effect of age-dependent hormonal and psychosocial factors in early adulthood. Involvement of the face and oily skin type were most frequently reported, in accordance with the crucial involvement of sebaceous function in the etiology of acne, although some differences were noted. The results also underscore the essential multifactorial causality of AV, with sebum over-secretion, psychic stress, menstrual fluctuation, family history, and dandruff being significant contributing factors. The high frequency of scalp dandruff and acne coexistence in our study indicates that inflammatory diseases affecting the scalp could impact the severity of facial disease and justifies an integrated approach to treating skin and scalp. The preference trend of the treatment was completely satisfactory for usual skin care including sunscreen lotions, though dermatological therapies were better in controlling scalp inflammation. In addition, high self-medication use in students results in inappropriate product use as muco-adhesive products, antibiotics, and steroids are unsupervised treatments. In general, these findings underscore the importance of implementing an early, integrated, and evidence-based strategy in the treatment of acne in the student population. An approach of this kind may include medical therapy, lifestyle intervention, managing stress, and the education of such patients. Combined treatment may be useful in decreasing the severity of disease, avoiding permanent sequelae, and enhancing patients' QOL in young adults; however, further awareness and follow-up are required.

CREDIT AUTHOR STATEMENT

TB, TA, AB: Validation, visualization, and writing - review and editing. BN, MKDJ, SM: Conceptualization, data curation, formal analysis, and investigation.

ETHICAL APPROVAL

This research does not involve human participants or animal subjects; therefore, no ethical approval was required.

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