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Research Article

Effect of Acne Vulgaris and its Impact on Quality of Life of Adolescents in Bengaluru

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Abstract

Background and Objective: Acne vulgaris is a chronic condition affecting more than 85% of adolescents and young adults. This study was conducted to assess the prevalence of acne vulgaris and its impact on quality of life (QoL) and to study socio-demographic factors, family history and lifestyle among the selected schools at Jalahalli area in Bengaluru. **Materials and Methods:** This study was a descriptive cross sectional school based study and 200 subjects were included. Predesigned, questionnaire to assess socio-demographic profile and QoL and symptoms of acne vulgaris were administered to the participants fulfilling inclusion criteria. Data were obtained by using different methods such as Global Acne Grading System (GAGS), Cardiff Acne Disability Index and Children's Dermatology Life Quality Index/Dermatology Life Quality Index (CDLQI/DLQI) respectively. SPSS 18.0 software was used for data analysis. **Results:** Findings showed that Acne prevalence was 87% affecting both sexes. Self-reported mild acne was present in 85.1% and moderate severe acne in 14.9% of the adolescents. The mean age of the subjects was 14.78 years, with 52.5% females and 47.5% males. A strong relation was found between the severity of acne and QoL ($p<0.001$). Heredity was correlated with acne and its severity was significant. **Conclusion:** Acne affects the QoL of an adolescent, and the impact is proportional to the severity of acne. Severe acne is associated with a greater effect on QoL. Evaluation of QoL in such patients may greatly help in the better management of acne, hence improving their quality of life.

Keywords: Acne vulgaris; Adolescent; Quality of life; GAGS; CDLQI; DLQI.

INTRODUCTION

Physical appearance is important in our society and influences the way in which we are perceived by others. The skin is the most visible organ of the body and determines, to a large extent, our appearance with a wide function in social and sexual communication[1]. Acne vulgaris is one of the most common skin disorders[2, 3]. Acne vulgaris is a common skin disease affecting up to 80% of adolescents and many adults at some stage. it is associated with a considerable psychological impairment which is comparable with certain chronic diseases like asthma, epilepsy, diabetes and arthritis[2, 3]. Acne patients are prone to low self-esteem, low confidence and social dysfunction which may lead to anxiety, depression, obsessive compulsive disorder and sometimes suicidal ideation[4]. Also prevalence of acne in school children reported ranges from 30-100% depending on age[5]. More severe acne has been suggesting to be associated with increased anxiety, depression symptoms and impact on patient life[6].

The psychosocial affect of acne was first recognized in 1948 when Sulz Barger Zalden mentioned that there is no single disease which causes more psychic trauma and more maladjustment between parents and children more general insecurity and feeling of inferiority and greater sums of psychic assessment than acne vulgaris. Acne is strongly associated with depression and anxiety[7].

Quality of life (QoL) is a general term which includes a feeling of joy and satisfaction with life. WHO defines QoL as the "individual's perception of their position in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" [4]. Acne vulgaris is a chronic inflammatory disease of the pilosebaceous follicles, common in adolescents, characterized by Comedones, papules, pustules, cysts, nodules, and occasionally scars[9]. The term acne is derived from the Greek word 'acme' which means 'prime of life'. Although generally considered to be a benign, self-limiting condition, acne may cause severe psychological problems or disfiguring scars that can persist for a lifetime[10].

According to Ibn-Sina, *Buthūr-i- Labaniyya* (acne vulgaris) are small white eruption on the nose and cheeks which resemble a

condensed drop of milk[11]. According to Qarshi it is a *Muta'addid* (contagious) disease in which small white eruption appears on face nose and cheeks, on pressing a cheesy material expressed out from it[12]. Causes of these eruption is a *mādda-i-ṣadīdiya* (suppurative material) which comes towards skin surface due to *bukharat-i-badan* (vapours of the body/abnormal heat)[11]. According to Hakeem Ajmal Khan, sometimes small pointed eruption appears on the face, neck, chest, cheeks and nose. These eruptions are hard and red in colour. When these eruptions become mature they excrete keel and some amount of pus[13]. According to classical Unani literature, *Buthūr* (eruptions) is a type of *waram* (inflammation). The difference is only in size. *Buthūr* is a small awram[14]. If any organ is unable to excrete out *fudlat* (morbid matters) from the skin or other organ disposed there *fudlat* towards this organ, and the organ is unable to dispose the waste, it results in *nutū'* (eminence) or elevation in an organ. If this elevation does not rupture the skin or mucous membrane then it is known as *waram*, and if the elevation is crushed it is known as *buthūr*. Buthur which are on the face and nose and are non-itching, they are known as *labaniyya* (milky eruption) or *ṣadīdiya* (suppurative)[15].

MATERIALS AND METHODS:

The present study was conducted by the department of Tahaffuzi wa Samaji Tib (Preventive and Social Medicine), National Institute of Unani Medicine, Bengaluru. The aims and objectives of the study were to assess the prevalence of acne vulgaris and its impact on the quality of life and to study socio-demographic factors, family history and lifestyle associated with the disease.

The study population comprised of school children of age group 12-18 years (adolescents) of selected area of Bengaluru. The duration of the study was one year, from January 2017 to December 2017. The sample size was calculated as 200 using formula = $Z^2_{\alpha/2} \times P \times (1-P) \times D \div E^2$ where P is the prevalence or proportion of event of interest for the study (P=70% taken from the previous studies), E is the precision or margin of error (E= 10% of P), $Z_{\alpha/2}$ is normal deviation at a 5% level of confidence (=1.96) and D is the design effect (which is 1 for simple random sampling).

Ethical Clearance: Before starting the study, a comprehensive protocol was prepared and put in for obtaining clearance from the Institutional Ethics Committee (IEC) of NIUM, Bengaluru. After getting ethical clearance with IEC No: NIUM/IEC/2015-16/019/TST/04 study was conducted.

Data was collected from a selected area of Bengaluru using simple random sampling method. A pretested structured questionnaire consisting of various questions and aspects regarding socio-demographic profile, acne vulgaris and the assessment of quality of life was administered to the respondents fulfilling inclusion criteria. Quality of life assessment data was obtained by using Cardiff Acne Disability Index (CADI), Children's Dermatology Life Quality Index/ Dermatology Life Quality Index (CDLQI/DLQI) and Acne grading was calculated by using GAGS.

Location	Factor
Forehead	2
Right cheek	2
Left cheek	2
Nose	1
Chin	1
Chest and upper back	3

Note: Each type of lesion is given a value depending on severity: no lesions = 0, comedones = 1, papules = 2, pustules = 3 and nodules = 4. The score for each area (Local score) is calculated using the formula: Local score = Factor × Grade (0-4). The global score is the sum of local scores, and acne severity was graded using the global score. A score of 1-18 is considered mild; 19-30, moderate; 31-38, severe; and >39, very severe

The Global Acne Grading System

Socio-economic status of the parents was calculated by using Kuppuswamy's socioeconomic status scale 2014. Measurement of the study variables included age, sex, gender, language spoken, and assessment of acne vulgaris in school children. Acne was graded in to mild, moderate and sever based on GAGS.

CDLQI is a general questionnaire to assess the quality of life. It consists of 10 questions about disease symptoms and feelings (question 1&2), leisure (question 4,5 & 6), school or holidays (question 7), personal relationships (question 3 &8), sleep (question 9), and treatment (question10). The scoring of each question is as follows: Very much = 3, Quite a lot = 2, Only a little = 1, Not at all = 0, Question unanswered = 0, Question 7: "Prevented work or studying" = 3. Its domain is from zero (without any effect on quality of life) to 30 (extremely large effect on quality of life). The CDLQI was calculated by summing the score of each question resulting in a maximum of 30 and a minimum of 0. The higher the score, the more quality of life is impaired.

Interpretation: 0-1 = No effect on child's life, 2-6 = Small effect, 7-12 = Moderate effect, 13-18 = Very large effect, 19-30 = extremely large effect.

The CDLQI/DLQI and CADI questionnaires were both copyright protected, so prior permission was granted from the University and authors before their use. The CDLQI was calculated by summing the score of each question, resulting in a maximum of 30 and a minimum of 0. The CADI questionnaire was specific for acne and contained 5 questions. The CADI score is calculated by summing the scores of each question, resulting in a maximum of 15 and a minimum of 0, from 0-3 leading to a total score of 0-15. The CADI score was graded as low (0-4), medium (5-9) and high (10-15). A higher score showed a very large impact on quality of life. Both

questionnaires were copyright protected, so prior permission was granted from the University and authors before their use. CDLQI was administered to adolescents age less than 16 years of age, while DLQI was administered to adolescents age 16 or above.

RESULTS:

A total number of 200 patients between the age of 11 to 18 years were taken in study. Patients were divided into 4 groups of which a maximum of 56.5% were among patients between 15-16 years followed by 32.5% of age group 13 to 14 years and 7% of patients of age group 17-18 years. Out of total number of 200 patients, 46% of patients were male and 54% of patients were female. In this study, out of 200 adolescents 36% of adolescents were dark and 64% were fair complexion. 69% were non vegetarian and 31% were vegetarian (Table 1).

Table 1: Association of demographic variables with Acne according to Respondents

Demographic variables	Acne vulgaris		Total (n=200)	P value
	YES	NO		
Age in years				
11-12	6 (3.5%)	2 (7.7%)	8 (4%)	0.202
13-14	57 (32.7%)	85 (30.8%)	65 (32.5%)	
15-16	101 (58.1%)	12 (46.1%)	113 (56.5%)	
17-18	10 (5.7%)	4 (15.4%)	14 (7%)	
Complexion				
Dark	55 (31.6%)	17 (65.4%)	72 (36%)	0.001
Fair	119 (68.4%)	9 (34.6%)	128 (64%)	
Type of Family				
Joint	13 (7.5%)	6 (23.1%)	19 (9.5%)	0.029
Nuclear	161 (92.5%)	20 (76.9%)	181 (90.5%)	
Socio Economic Status				
Upper Class	154 (88.5%)	19 (73.1%)	173 (86.5%)	0.001
Upper Middle	17 (9.78%)	5 (19.2%)	22 (11%)	
Lower Middle	2 (1.15%)	2 (7.7%)	4 (2%)	
Upper Lower	1 (0.5%)	0 (0.0%)	1 (0.5%)	
Food Habits				
Non Veg	120 (68.9%)	18 (69.2%)	138 (69%)	1.000
Veg	54 (31.1%)	8 (30.8%)	62 (31%)	
Gender				
Female	94 (54.0%)	11 (42.3%)	105 (52.5%)	0.2973
Male	80 (46.0%)	15 (57.7%)	95 (47.5%)	

Table 2: CADI distribution according to gender of Respondents

CADI	Gender		Total
	Female	Male	
Low	33 (35.1%)	38 (47.5%)	71 (40.8%)
Medium	42 (44.7%)	35 (43.75%)	77 (44.3%)
High	19 (20.2%)	7 (8.75%)	26 (14.9%)
Total	94 (100%)	80 (100%)	174 (100%)

CADI scores showed that acne had a low effect in 40.8% of patients, majority had a medium effect in 44.3%, and a high effect in 14.9% (Table 2).

Table 3: CDLQI distribution according to of respondents

CDLQI	Gender		Total
	Female	Male	
No Effect	7 (7.4%)	10 (12.5%)	17 (9.8%)
Low effect	1 (1.1%)	0 (0%)	1 (0.6%)
Small Effect	11 (11.7%)	12 (15.0%)	23 (13.2%)
Moderate effect	20 (21.3%)	20 (25.0%)	40 (22.9%)
Very Large Effect	19 (20.2%)	17 (21.3%)	36 (20.7%)
Extremely large effect	36 (38.3%)	21 (26.2%)	57 (32.8%)
Total	94 (100%)	80 (100%)	174 (100%)

P<0.001**, Significant, Fisher Exact Test

Acne had no effect on 9.8% of patients, small effect in 13.2%, moderate effect in 22.9%, very large effect in 20.7% and extremely large effect in 32.8% (DLQI scores) (Table 3).

Table 4: CDLQI/DLQI distribution according to GAGS of respondents

CDLQI/DLQI	GAGS				Total
	Mild	Moderate	Severe	Very Severe	
No Effect	17 (11.7%)	0 (0%)	0 (0%)	0 (0%)	17 (9.8%)
Low effect	1 (0.6%)	0 (0%)	0 (0%)	0 (0%)	1 (0.6%)
Small Effect	23 (15.5%)	0 (0%)	0 (0%)	0 (0%)	23 (13.2%)
Moderate effect	40 (27.0%)	1 (5.3%)	0 (0%)	0 (0%)	41 (23.6%)
Very Large Effect	32 (21.6%)	2(10.5%)	0(0%)	0(0%)	34 (19.5%)
Extremely large effect	35 (23.6%)	16 (84.2%)	3 (100%)	4 (100%)	58 (33.3%)
Total	148 (100%)	19 (100%)	3 (100%)	4 (100%)	174 (100%)

P<0.001**, Significant, fisher exact test

The severity of acne has a direct impact on quality of life.

DISCUSSION:

Acne is more common in adolescent females, confirming previous findings that it is common[16]. However, the prevalence of acne has been reported to be lower in some studies[17]. This study found that 56.5% of subjects (113) were in the age group of 15-16 years, which is in line with Jancovic *et al.,* finding that acne prevalence is higher at this age of 16 and 17 years[18]. Balakrishnan *et al.,* also reported that acne is a chronic disease affecting 85% of teenagers[19].

This study found that 52.5% (105) of the study population were females, while 47.5% were males (95). This is in line with previous studies conducted by Ismail *et al.,* and Chinese in 2012, which reported that acne in adolescents was predominant in males and adult acne was common in females[20, 21].

Our study found that 85.1% (148) of students had mild acne, with 10.9% (19) having moderate acne, 1.7% (3) having severe and 2.3% (4) having very severe acne. Comparative studies conducted by Yahya *et al.,* and Kaduna *et al,.* and Hanisha *et al.,*[16] in Malaysian adolescents showed 93.1% and 90.2% frequency of mild acne respectively. Tan *et al.,*[22] found a near equal prevalence of moderate/severe acne (48.6%) and mild (51.4%) in Singaporean adolescents. Agheai *et al.,* and Mallon *et al* found more moderate/severe grades of acne (84%) than mild grades (16%) in hospital-based studies [23]. In the UK this is not unexpected, as persons with more severe diseases are likely to seek medical intervention, thus hospital-based studies are likely to yield more severe forms of acne compared to community-based ones such as ours. Same as in the UK are likely to yield more severe forms of acne than community-based ones, as people with more severe diseases are likely to seek medical intervention.

The overall CADI score was 44.3% (77), indicating a mild degree of disability from acne. Similar values were obtained in some community-based studies[16], while higher scores were obtained by Motley and Finlay [24] in the UK and Oakley [22] in New Zealand, respectively. Several reasons may be adduced for the relatively higher CADI scores in the two latter studies, which were hospital-based: Firstly, hospital-based studies have a higher concentration of persons with more severe grades of acne compared to community-based surveys. Secondly, the ages of patients in hospital-based surveys are varied compared to the exclusively adolescent age of fore mentioned community-based studies. Another factor may be cultural and/or racial; the studies with higher CADI scores were conducted in Western societies.[24] The studies with higher CADI scores were conducted in Western societies[24].

Our study showed that the impact of acne on quality of life was proportional to its severity. These results are in agreement with similar studies where both acne and severity are self-reported[25, 23, 26, 27, 28, 16, 29, 30].

The correlation between CADI and GAGS was found to be significant (p<0.001). This is in line with previous studies conducted by Hanisha *et al.,*[16] who reported that severity of

acne correlates strongly with quality of life. However, Law *et al* [35] reported that the correlation between GAGS and CADI was weak.

This study found that acne had a moderate to extremely large effect on quality of life in patients with acne, similar to Safizedeh H *et al.*, and Haritha *et al.*, who found a moderate to very large effect in adolescents (Table 3).

This study found that Acne vulgaris had a medium effect 44.3% (77) on adolescents based on CADI score, indicating a high psychosocial burden. Hanish *et al.,* reported that patients felt aggressive, frustrated or embarrassed as a result of having acne[16].

A study done in the psychiatry OPD of a medical institution in New Delhi found significantly higher psychiatric morbidity in patient with acne vulgaris. Similarly, in our study, a significant correlation of GAGS score with CDLQI/DLQI ($p<0.001$) and CADI ($p<0.001$) was found. The result showed that acne has an impact on quality of life[36].

This study has a few limitations, such as limited to a small geographical location, over reporting in a cross sectional study design. These limitations limit the causality of relations, as the sample size was less than many other studies. Additionally, the results cannot be generalized to the entire city.

CONCLUSION:

Thus, it may be concluded that evaluation of the quality of life in patients with acne is important as it helps in the pharmacological as well as psychological treatment of these patients in a more effective and integrated way. Further Health education is needed in our secondary schools and society to ensure that adolescents understand their disease and know what treatments are available and from whom they should seek advice. A Health professional should be aware that early acne treatment can prevent the progression of the disease and its complication.

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