The Prevalence and factor affecting Acne vulgaris among Nangarhar University Students

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ABSTRACT:

Background: Acne can cause severe psychological problems, undermining self-assurance and self-esteem at a vulnerable time in life. Acne is one of the most common skin diseases. A significant number of patients either continue to experience acne or develop new-onset acne after the teenaged years.

Objective: To study the prevalence of acne in Nangarhar university students and to investigate risk factors for acne in these subjects.

Methods: We have randomly selected university students above 18 years of age, males and females. A questionnaire was designed and distributed to the students and the results were analyzed by SPSS. This study was carried out in Nangarhar University at Medical, Computer Science and Education faculties from 15 SEP 2019 to 15 MAR 2020.

Results: There was a high prevalence of acne on the face, back and chest, with high rates of dissatisfaction in males and females. High proportion of males and females had oily skin and males had significantly higher proportion of oily skin compared to females. High proportion of subjects had family history of acne. Facial nature (dry, oily or combined), stress, family history of acne and using corticosteroids were significantly associated with higher incidence of acne. Our subjects had 1.8 times risk of developing acne because of facial nature, had 1.7 times of risk of developing acne if they were under stress compared to those who were stress-free, and had 3.5 times risk of developing acne if they come from a family with history of acne compared to those with no family history of acne. Subjects who used corticosteroids had 2.5 risk of developing acne compared to those who did not use corticosteroids.

Conclusion: The students showed high prevalence of acne and facial nature, stress, family history of acne and use of corticosteroids were major risks for acne in these subjects.

Keywords: Acne vulgaris, Oily skin, psychological problems, undermining self-assurance and self-esteem.

Introduction:

Acne vulgaris is a disorder of the Pilosebaceous follicles found in the face and upper trunk. At puberty androgens increase the production of sebum from enlarged sebaceous glands that become blocked and infected with Propionibacterium acnes causing an inflammatory reaction. [1] Comedones (follicles impacted and distended by incompletely desquamated keratinocytes and sebum) may be open (black-heads) or closed (white-heads). Inflammation leads to papules, pustules and nodules. [1] Acne is one of the most common skin diseases. It affects between 40 million and 50 million individuals in the United States [2] is often mistakenly thought to affect exclusively the teenaged group.

However, a significant number of patients either continue to experience acne or develop new-onset acne after the teenaged years. [3] Women were more likely to report having acne than men. [3] Another study found some degree of facial acne in 54% of women and 40% of men older than 25 years. [3] In this group, clinical facial acne affected 12% of the women and 3% of the men and persisted into middle age. Cunliffe and Holland 1989[4] reported similar results 20 years earlier.

In pediatric populations, the prevalence of acne increases with age. In 10- to 12-year-old children, 28% to 61% of the population has clinically diagnosed acne; whereas 79% to 95% of 16- to 18-year-old Adolescents are affected.[5-7] Even a significant percentage of children (aged 4-7 years) are diagnosed with acne.[6-7] Thus in the Western world, acne is a ubiquitous skin disease affecting primarily adolescents but also a significant portion of adults older than 25 years.[4] Although knowledge concerning the dermatological treatment of chronic acne has grown considerably in recent years, relatively few studies have assessed the impact of effective physical intervention upon the psycho emotional functioning of patients.[3-4]

Acne can cause severe psychological problems, undermining self-assurance and self-esteem at a vulnerable time in life. Severe acne is associated with increased depression, anxiety, poor self-image and poor self-esteem. [8-9] Psychiatric symptoms are more common in more severe acne and in the later stages of puberty. [10] Acne is associated with increased risk of depression, anxiety and suicidal tendencies and there are some interesting gender differences. [10-11]

A few large studies have shown frequent depressive symptoms in adolescents with acne. These studies conducted a computerized questionnaire survey of 2,491 Australian high school students and found self-rated moderate acne to be associated with an increasing frequency of psychiatric symptoms, and more likely to be reported in the later stages of puberty. [12-13] A cross-sectional, questionnaire-based study done by Halverson JA [14] to explore the relationship of suicidal idea, mental health problems, and social functioning to acne severity among adolescents aged 18-19 years. The study found that 14% of the subjects reported having substantial acne (a lot and very much). Among those with very much acne, as compared those with no/little acne, suicidal idea was more among girls than boys (22.6 % vs 6.3%)

“Acne is frequently found in late adolescence and is associated with social and psychological problems. Adverse events including suicidal ideation and depression that have been associated with therapies for acne may reflect the burden of substantial acne rather than the effects of

medication". [15] Zouboulis et al [16], emphasized that, there is a causative link between emotional stress and acne.

Recent and ongoing studies have indicated that human sebocytes express functional receptors for corticotrophin-releasing hormone, melanocortins, beta- endorphin, vasoactive intestinal polypeptide, neuropeptide Y and calcitonin gene-related peptide. After ligand binding, these receptors modulate the production of inflammatory cytokines, proliferation, differentiation, lipogenesis and androgen metabolism in sebocytes. By means of their autocrine, paracrine and endocrine actions, these neuroendocrine factors appear to mediate centrally and topically induced stress towards the sebaceous gland, ultimately affecting the clinical course of acne. [16]

Almost every teenager can expect to experience acne to some degree during the adolescent years. Genetic factors play a part and a positive family history is often a factor; concordance among twins has been demonstrated. [14]

Acne may be presenting at a younger age because of earlier puberty. It is unclear if ethnicity is truly associated with acne. Black individuals are more prone to post inflammatory. Acne persists into the 20s and 30s in around 64% and 43% of individuals, respectively. The heritability of acne is almost 80% in first-degree relatives. Acne occurs earlier and is more severe in those with a positive family history. Suicidal ideation is more common in those with severe compared with mild acne. A possible association between dairy food intake and acne requires closer scrutiny. Natural sunlight or poor hygiene are not associated. The association between smoking and acne is probably due to confounding. Validated core outcomes in future studies will help in combining future evidence. [17]

Acne tends to occur in adolescence, when hormones are in a state of flux. In girls it may flare up when they are premenstrual. [1] Acne may be associated with polycystic ovarian syndrome & result from abnormal production of androgens. This may occur in testosterone replacement therapy, abuse of anabolic steroids, Cushing's disease or in virilising tumours in women, such as arrhenoblastoma. [1]

The severity of the condition varies enormously between individuals. It is unsightly but the degree of distress is sometimes disproportionate. [1] Some pores become blocked (plugged).

This is due to the skin at the top of the pores becoming thicker, combined with dead skin cells that are shed into the pores. You can see the plugs that block the top of the pores as tiny spots known as comedones (black-heads and white-heads) 2. Some sebum may collect under blocked pores. You can see this as small spots called pimples or papules. In some cases, acne does not progress beyond this mild-to-moderate stage when you can see a number of small pimples, blackheads, and whiteheads. [1]

Good results were observed in 94.8% of the patients aged 12 to 20 years, and in 92.6% of the patients aged 21 to 35 years. Failure of the treatment occurred in 5.2% and 7.4% of the two groups, respectively. Twenty-one patients dropped out of the study because of lack of compliance, and another patient discontinued participation because of a laboratory side effect. During the 4-year follow-up period, relapses of the acne occurred in 3.9% of the patients aged 12 to 20 years and in

5.9% of the patients aged 21 to 35 years. Elevated serum lipid levels (up to 20% higher than the upper limit of normal value) were found in 4.2% of the patients and abnormal (<twice the upper limit of normal values) liver tests were observed in 4.8%. [18]

Six months of treatment with low-dose isotretinoin (20 mg/d) was found to be effective in the treatment of moderate acne, with a low incidence of severe side effects and at a lower cost than higher doses. [18]

A study done on 34 patients (19 men and 15 women) with chronic acne were assessed for psychological, emotional and dermatological symptomatology using a variety of self-report questionnaires over four time-points during 16 weeks' treatment with isotretinoin.

At the first assessment, prior to isotretinoin treatment, (44%) reported clinically significant levels of anxiety, (18%) reported clinically significant depression. Women with acne were significantly more embarrassed than their male regarding their skin disease. The study's outcome was emphasized that the treatment with isotretinoin produced significant improvements across a wide variety of psychological functions, although the emotional status of patients appeared to be more resistant to change. Acne appears to be a condition which has the potential to damage, perhaps even in the long term, the emotional functioning of some patients. [19]

The aim of the study was to study the prevalence of acne in Nangarhar University Students and to investigate risk factors for acne in these subjects.

METHODS:

We designed and conducted a questionnaire to investigate the prevalence of Acne Vulgaris and factors affecting acne in a population of university students at Medical, Computer Science & Education faculties, Nangarhar University, Nangarhar, Afghanistan. The questions were related to demographic parameters, factors affecting acne like habits and treatment used. We studied 900 Nangarhar university students from Medical, Computer Science & Education faculties, 375 males (41.7%) and 525 females (58.3%) were studied.

Validity and Reliability Testing of the Questionnaire:

The questionnaire designed in Arabic language and it was also validated by the forward backward translation method in translating the questionnaire into Arabic language, to ensure conceptual equivalence. The validity of an instrument is the extent to which it actually measures what it is designed to measure. In survey work, this refers to the extent to which the questions collect accurate data relevant to the study's objectives. Evidence of validity may be gained through observation, expert and lay judgment, and empirical inquiry.

Furthermore, the researchers were also asked to read the survey and to give their feedback, if they will have any. All of their views and comments were considered and then incorporated into the final version of the questionnaire. To assess test-retest reliability, the questionnaire was distributed to 10 participants (not included in the final sample) randomly chosen from the study areas. The second response was elicited two weeks after the initial test. No problems were highlighted, and test-retest reliability was calculated using Spearman's correlation coefficient (r).

The rho value was 0.73, which implies an acceptable level of test re-test reliability. The alpha coefficient was 0.7; indicating that most of the items included make a valid contribution to the overall score.

Data analysis:

The participants' responses were encoded and the data were analyzed using Statistical Package for the Social Sciences (SPSS, version 20.0, Chicago, IL, US). We used descriptive statistics, frequency, t-test, and Chi-square test. We studied risk factors of acne using Odds Ratio with 95% C.I. Significance was at p less than or equal 0.05. Descriptive analysis was used to calculate The proportion of each group of respondents with each statement in the questionnaire.

Chi- Square test used to ascertain and to find out the association between the independent variables (demographic characteristics such as age, gender, height, weight, etc.) and dependent variables (acne, symptoms, complication, etc.). The level $P < 0.05$ was considered as the cut-off value for significance.

Results:

From table 1, we can observe that there was a very high significant differences in weight and height between males and females. Males were significantly heavier and taller than females. There was no significant difference in BMI between males and females.

From table 2, we can observe that generally there was significant differences in the characteristics, experience and treatment of acne between male and female students. There was high prevalence of acne in both males and females. High proportion of males and females had oily skin and males had significantly higher proportion of oily skin compared to females (55% vs 35%). About 40% of both males and females had family history of acne.

Female students had significantly more stress than male students. More females were significantly using facial cleansing products regularly. Prevalence of smoking was significantly higher in males than females. Females used facial cleansing products, exposed to strong sunlight, and used sun-block products before being exposed to strong sunlight significantly more often than males. Generally, daily intake of water was more in females than males.

From Table 3, facial nature (dry, oily or combined), stress, family history of acne and using corticosteroids were significantly associated with higher incidence of acne (OR) (CI): 1.8 (1.20-2.90); 1.7 (1.11-2.58); 3.5 (2.58-4.80) and 2.5 (0.83-7.40), respectively.

Table 1. Physical measurements in all subjects studied (Mean +/- SD)

Variable	All subjects (n= 900)	Males (n= 375)	Females (n=525)
Age (yrs)	23.3 (6.4)	22.4 (5.9)	22.2 (5.0)
Weight (kg)	67.4 (18.9)	77.2 (18.2)***	60.3 (11.5)
Height (cm)	167.9 (10.2)	175. (8.2)***	162.3 (7.4)
BMI	23.8 (5.7)	25.0 (5.7)	23.0 (5.6)

***-p less than 0.001

Table 2. Frequency and Percentage of responses in males, females and all subjects

Variable	Females(n=375)	Males(n=525)	All n=900
Suffering from Acne	242 (64.5%)	341 (65%)	583 (64.8%)
Diagnosed with a high level of androgen hormones	30 (8.0%)	38 (7.2%)	68 (7.6%)
Diagnosed with P.bacterium acnes	37 (9.91)***	62 (11.8%)	99 (11.0%)
Facial skin			
Dry	41 (10.9%)	69 (13.1)	110 (12.2%)
Oily	206 (54.9%)***	182 (34.7)	388 (43.1%)
Combined	128 (34.1)***	274 (52.2%)	402 (44.7%)
Do you have stress	317 (84.5)**	484 (92.2)	801 (89%)
Hours spent on computer/TV/Smartphone per day			
less than 1 hr	6 (1.6%)	13 (2.6%)	19 (2.1%)
1-3 hrs	87 (23.2%)	137 (26.1%)	224 (25%)
4-6 hrs	155 (41.3%)	205 (39.0%)	360 (40%)
More than 6hr	127 (33.9)	170 (32.4%)	297 (33%)
Family history of Acne	150 (40%)	204 (38.9)	356 (39.3%)
Squeezing facial lesions	257 (68.5%)	320 (61.0)	577 (64.1%)
Smoker	107 (28.5%)***	54 (10.3)	161 (17.9%)
Using facial cleansing products regularly	94 (25.1%)***	226 (43.0%)	320 (35.6%)
Usually exposed to strong sunlight	264 (70.4%)**	322 (61.3%)	586 (66.1%)
Use sun-block products before being exposed to strong sunlight	26 (6.9%)***	240 (45.7%)	266 (29.6%)
Daily intake of water			
less than 1 glass	16 (4.3) ***	45 (8.6%)	61 (6.8%)
1-4 glasses	150 (40%)**	265 (50.5)	415 (46.1%)
5-8 glasses	148 (39.5) *	165 (31.4)	313 (34.8%)
9-12 glasses	49 (13.1) ***	39 (7.41%)	88 (9.8%)
More than 12 glasses	12 (3.2%)	11 (2.1%)	23 (2.6%)
Eating large amount of			
Chocolate	134 (35.7%)**	219 (41.7)	353 (39.2%)
Spicy food	117 (31.2%)*	138 (26.3%)	255 (28.3%
Chips/Fast/Fried Food	199 (53.1%	251 (47.8%)	450 (50%)
Fruit and vegetables	148 (39.5%)	223 (42.5)	371 (41.2%)
Having long-term oral corticosteroids therapy	13 (3.5%) *	9 (1.7%)	22 (2.4%)
Have tried to treat acne	189 (62.4%)	250 (59.8)	439 (60.9%)
Acne Treatments			
Antibiotics	49 (32.2%)**	57 (25.6%)	106 (28.3%)
Herbal	10 (6.6)	15 (6.7%)	25 (6.7%)
Oral	18 (11.8%)	19 (8.5%)	37 (9.9%)

Keratolytics	11 (7.2) *	9 (4%)	20 (5.3%)
Topical	34 (22.4) **	36 (16.1%)	70 (18.7%)
Combination	30 (19.7%)	87 (39%)	117 (31.2%)

*-p less than 0.01 (S); **-p less than 0.01 (HS); ***-p less than 0.001 (VHS)

Table 3. Factors Affecting Acne

Factor	Acne N	(n=583) %	No Acne N	(n= 317) %
Facial				
Dry	35	6	75	24***
Oily	308	53	80	25***
Combined	240	41	162	51*
Stress	530	91	271	86*
Family History of Acne	286	49	68	22***
Smokers	97	17	64	20
Exposed to Strong Sunlight	383	66	203	64
Using Sun Block	165	28	101	32
Drinking water				
1-4 glasses	276	47	139	44
5-8 glasses	206	34	113	36
Spicy food	155	27	100	32
Chips/Fast/Fried Food	293	50	157	50
Fruit and vegetables	234	40	137	43
Using Corticosteroids	18	3	4	1*

*-p 0.05 (S); **P 0.01 (HS); ***p 0.001 (VHS). OR: Odds Ratio:CI: confidence Intervals.; S: significant; HS: High Significant; VHS: Very High Significant

Discussion:

A survey done by Collier et al, 2008 to assess the prevalence of acne in 1013 teenaged years, and aged 20 to 29 years, 30 to 39 years, 40 to 49 years, and 50 years and older, the prevalence of acne reported in women versus men was as follows: 20 to 29 years, 50.9% versus 42.5% (P = 0.0073); 30 to 39 years, 35.2% versus 20.1% (P < .0001); 40 to 49 years, 26.3% versus 12.0% (P < .0001); and 50 years and older, 15.3% versus 7.3% (P = .0046). the cut point of the study is that the women were more likely to report having acne than men.

Acne is a highly prevalent disease among adolescents and young adults. Studies indicate that up to 95% of men and 83% of women are affected by it until they reach their twenties. (9) In approximately 10% of cases, acne becomes severe. [6,10,11] Adolescence is a period of physical, emotional and social changes. [3,6]

It is a transition and adaptation phase, in which adolescents form new relationships, friendly and romantic, and begin to acquire a new status in society. [11] This is the exact period that acne appears. Prevalence of juvenile acne and the proven emotional impact that this disease causes. [20-21]

There are no studies focusing on the male population. In addition, the above study comprised 2,200 men and it is considered a population-based study, hitherto unavailable in any other published work, with Brazilian samples. In this study, gender and age are not variables, representing a limitation of this study.

The impact caused by acne can be more severe for patients than doctors believe; therefore, it is important to focus the evaluation on the individual's subjectivity, not only on the objectivity of the skin lesion.

This shows that subjects have 1.8 times risk of developing acne because of facial nature. Also, they have 1.7 times of times of developing acne if they are under stress compared to those who were stress-free. They have 3.5 times risk of developing acne if they come from a family with history of acne compared to those with no family history of acne. Those who used corticosteroids had 2.5 risk of developing acne compared to those who did not use corticosteroids. Others defend that the presence of more than 20 lesions, including inflammatory ones, is required for the diagnosis.

A study with 4,191 subjects revealed an acne prevalence rate of 68.5% in boys and 59.6% in girls, with the presence of one comedone considered sufficient for the diagnosis. Another study encompassing 914 patients, described a prevalence rate of only 27.9% for boys and 20.8% for girls.23 The average prevalence rate in adolescents ranges from 70 to 87%, without significant differences between countries. [18]

A study that analyzed gender and age demonstrated that, among girls, 61% had acne at the age of 12, and 83% at 16, with higher incidence between the ages of 15 and 17. Among boys, the prevalence of acne was 40% at the age of 12, but increased to 95% at 16, with a peak between 17 and 19 years. 20,23 Our analysis found that the prevalence of acne in male adolescents was 95.9%, with no difference in female adolescents (96.1%), which increased with age.

Ninety-three (20.6%) of the 452 adolescents evaluated, reported previous treatment for acne. A study in New Zealand showed that 67.3% of the students surveyed reported having acne and significantly more difficulty in accessing medical treatment, compared with those who did not mention acne (46.0% vs. 13.3%, OR 5.29). These differences persisted after controlling for socioeconomic factors. [13]

Acne in younger patients is predominantly non-inflammatory and differs from that observed when onset occurs later. With age, the increased production of sebum settles, favoring skin colonization by Propioniumbacterium acnes and other bacteria, which trigger immune response and the development of inflammatory lesions, such as papules, pustules, and nodules. In the young, there are follicular plugs and comedones, but the production of sebum is insufficient for bacterial growth. [16]

Currently, it is considered that the onset of acne occurs earlier in girls (11 years) than in boys (12 years). (12) A study in Brazil showed that the average age of onset of acne symptoms in females was 14.3 ± 4.1 years. [18] Recently, studies have reported early onset of acne, at the age of 8 or 9, in line with epidemiological data, suggesting earlier start of puberty. A study conducted by Al-Shidhani [21] assessed the impact of acne on the quality of life on 100 students of Sultan Qaboos University. The study showed that acne affects the quality of life of affected students treated by primary care physicians at the Student Clinic. Therefore, physicians should take into account the effect of acne on the persons' quality of life when individualizing treatment.

Conclusion:

This population-based study found a high prevalence of acne on the face, back and chest, with high rates of dissatisfaction in males and females. High proportion of males and females had oily skin and males had significantly higher proportion of oily skin compared to females. high proportion of our subjects had family history of acne.

Facial nature (dry, oily or combined), stress, family history of acne and using corticosteroids were significantly associated with higher incidence of acne. Our subjects had 1.8 times risk of developing acne because of facial nature, had 1.7 times of times of developing acne if they are under stress compared to those who were stress-free, and had 3.5 times risk of developing acne if they come from a family with history of acne compared to those with no family history of acne.

We have also illustrated that those who used corticosteroids had 2.5 risk of developing acne compared to those who did not use corticosteroids. More studies recruiting high number of subjects will add more information about the prevalence and factors affecting acne in young people. This will help to implement intervention strategies to reduce the incidence of acne.

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