

Comparison of the Risk of Depression and Anxiety Between Adolescent and Adult Patients Diagnosed with Acne Vulgaris in a Tertiary Government Hospital*

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ABSTRACT

Background: Acne vulgaris is a common condition, affecting at least 80% of adolescents and adults aged 11-30. In a on fourth of the adolescents affected, it is moderate to severe. Once considered a disease occurring in puberty, studies have shown the prevalence of acne occurring up to the 5th decade. Many studies have shown the relationship between skin disease and mental health. And among acne vulgaris patients, there are reports of psychological disorders and negative quality of life. Many studies have been done about the risk of anxiety and depression among adolescents. However, because acne is more common among adolescents, limited studies have been done regarding the psychological impact of acne among adults.

Objectives: To compare the proportion of risk of anxiety and depression between adolescent and adult acne vulgaris patients in a tertiary government hospital OPD and Skin Center using the Hospital Anxiety and Depression Scale in English and Pilipino (HADS/HADS-P).

Materials and Methods: A cross-sectional study design was used. Forty-six subjects (23 adolescent and 23 adult) diagnosed with acne vulgaris were included in the study. Eligible subjects underwent a thorough dermatologic evaluation. The Global Acne Grading System (GAGS) was used to evaluate the severity of acne. The validated HADS/HADS-P questionnaire was used to assess the risk of anxiety and depression. Independent Students t-test was used to compare means between the groups. Chi-square test was used to compare proportions. Statistical significance was based on p-values ≤ 0.05 .

Results: Among the adolescents included, 56.5% were female and 43.5% were male ranging from 13-24 years old. The adult subjects were consisted of 87% females and 13% males ranging from 25-47 years old. The most frequent age of onset of acne was between 11 to 19 years among adolescents and 12 to 18 years among adults (91.3% vs 56.5%; $p=0.017$). Duration of acne among adolescents was 4.4 ± 3.0 years and 10.3 ± 6.4 years among adults ($p<0.0001$). In the adolescent group, subjects had moderate (56.5%) or mild (43.5%) acne. Adults had mild (60.5%), moderate (30.4%) or severe (8.7%) acne. There was a significant difference in the risk of anxiety and depression between adolescents and adults ($p=0.007$). There were 21 adolescents (93%) and 12 adults (52.2%) who were at risk. Of the subjects included in the study, adolescents were approximately 10 times more likely to be at risk of anxiety and depression (OR=9.625, 95% CI: 1.821, 50.866).

Conclusion: Acne vulgaris is associated with negative psychosocial effects on both adolescent and adult patients. The results of this study are consistent with previous findings across cultures. Because acne is not just a physical problem for many patients, it is important for healthcare practitioners, especially dermatologists to be able to see the red flags for psychological comorbidities among patients. The Hospital Anxiety and Depression Scale is a quick and simple tool to use for physicians for risk assessment that can be done in the clinics and can aid in providing a more holistic treatment for patients.

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INTRODUCTION

Acne is a disease of the pilosebaceous unit characterized by polymorphic lesions¹⁴. These may include comedones, macules, papules, pustules, nodules, and pseudocysts. It is frequently seen on the face and trunk. Acne is a chronic condition and may cause severe scarring. It is a common skin condition that affects at least 80% of adolescents and adults aged 11-30⁸ and in 20-25% of adolescents, acne is moderate to severe¹⁴. It is noted to have the greatest severity between 16-19⁶ years and usually starts earlier and lasts longer in females. However, in males, more severe disease is frequently seen.

Once considered to be a condition generally occurring during puberty which regresses in the 2nd decade, studies have shown the prevalence of acne among adults up to the 5th decade of life. Adult acne vulgaris is defined as acne occurring in individuals beyond 25 years of age. Two forms of adult acne have been identified: 1) persistent acne, wherein acne persists from adolescence, and 2) late-onset acne, wherein acne presents first beyond the age of 25. Little studies have delved into the epidemiology of adult acne. A study in Germany found that 64% of those aged 20-29 and 43% of those aged 30-39 have visible acne¹⁵. Most cases have been found to occur among females.

Reports have shown a relationship between skin diseases and mental health. In patients with acne, there are reports of psychological disorders including anxiety, depression, aggression, low self-esteem, suicidal ideation and attempts^{2,4,5}. It was also found that acne is associated with a negative impact in social interactions, job-seeking, and overall quality of life¹⁴. Once thought to be merely a physiological condition, it is well-reported that acne may cause significant morbidity.

REVIEW OF RELATED LITERATURE

Numerous literature regarding acne vulgaris have mainly focused on epidemiology and treatment. However, the psychosocial impact on patients has not been extensively studied and addressed. It was previously found in studies that acne is associated with several psychological disorders especially among adolescents. The physical effects

of acne such as scarring may have profound psychological and social effects⁶. Approximately 30-50% of individuals aged 12 and 20 years with acne was found to have lowered self-esteem, lack of confidence, perceived social rejection, anxiety, and depression in several surveys⁶. Studies show that acne severity is positively correlated with depression.

However, a few reports show otherwise. It was suggested that negative self-image contribute to the incidence or severity of depression. Other studies have established suicidal ideation among adolescents and young adults. In study conducted among 9398 secondary school students in New Zealand with acne, 2185 (23.6%) reported having suicidal thoughts.

Because acne is predominantly found among adolescents, there are limited studies reporting on the psychosocial impact of acne among adults. It was found that adult acne was more prevalent among females and also seek consult twice as much as men⁸. Higher rates of depression were also found among females. Because acne is perceived to be a disease among adolescents, patient with adult acne experience increased anxiety. Higher risk for depression was found may be due to additional stresses on motherhood, adult sexuality, career demands, and aging⁸.

The Global Acne Grading System is an acne severity scale that includes six locations on the face and chest/upper back. A factor is provided for each of the six locations to get a local score with the maximum global score of 44. Acne severity is rated as none, mild, moderate, severe, and very severe with corresponding cut-off scores.

The Hospital Anxiety and Depression Scale was developed as a reliable screening tool for anxiety and depression in the hospital, out-patient, and community setting. The 14-item self-administered questionnaire is divided into an Anxiety subscale (HADS-A) and a Depression subscale (HADS-D) with 7 items each. Responses are rated 0-3, with the highest score of 21 for each subscale. A score of 8 has been validated to be a reliable cut-off score for identifying risk for anxiety and depression. In the Philippines, De Guzman conducted a validation of the Tagalog version of the HADS among patients seen in the University of the

Philippines – Philippine General Hospital (UP-PGH). The optimal score found to be the most sensitive and specific is 11.

SIGNIFICANCE OF THE STUDY

Acne vulgaris does not only significantly impact physical appearance of patients, but also the psychosocial aspects of their lives. According to the World Health Organization, depression is a leading cause of disability worldwide. In the past, dermatologists have underestimated the prevalence of psychiatric disorders and have poor sensitivity in recognizing red flags. One study found that dermatologists only discussed psychological issues in 39% of acne visits with no further action taken⁸. It has been established in numerous studies that acne among adolescents and even adults is associated with anxiety and depression. Given this, it is not enough for dermatologists to address just the cutaneous problem. It is important to take a holistic approach and probe deeper into the potential negative impact on the overall well being of the patients.

No previous studies have been done in the Philippine setting that assesses the risk for anxiety and depression among adolescent and adult acne vulgaris patients. By doing so, we can address the psychosocial effects of Acne Vulgaris among patients across different age groups in the Filipino population. Consequently,

1. The dermatologists and the patients can work better in formulating treatment strategies and plans. By having realistic and achievable goals in acne treatment, patient and doctor dissatisfaction and frustration can be avoided. Addressing the psychosocial issues of patients will help facilitate a deeper relationship between doctors and patients. In turn, this can decrease incidences of "doctor shopping" and poor continuity of care.
2. By assessing the risk of anxiety and depression of acne patients, the dermatologists may be able to discern the need for referring patients to a psychologist or psychiatrist for further evaluation.

By identifying and acknowledging the negative psychosocial effects of chronic and disfiguring dermatologic diseases, we will be able to provide more comprehensive and holistic care for our patients.

RESEARCH QUESTION

Among patients with acne vulgaris, how do the adolescents and adults differ in their risk of anxiety and depression using the Hospital Anxiety and Depression Scale/ Hospital Anxiety and Depression Scale – Pilipino (HADS/HADS-P)?

OBJECTIVES OF THE STUDY

General Objective

- To compare the proportion of risk of anxiety and depression between adolescent and adult acne vulgaris patients in a tertiary government hospital OPD and Skin Center using the Hospital Anxiety and Depression Scale in English and Pilipino (HADS/HADS-P).

Specific Objective

- To determine the demographic characteristics of acne vulgaris patients seen at the OPD and Skin Center of a tertiary government hospital.
- To assess the severity of acne vulgaris in patients using the Global Acne Grading System (GAGS)
- To determine the risk of anxiety and depression among acne vulgaris patients, using Hospital Anxiety and Depression Scale/ Hospital Anxiety and Depression Scale – Pilipino (HADS/HADS-P)
- To compare the proportions of adolescent and adult acne vulgaris patients with the risk of anxiety and depression according to
 - Sex
 - Severity of acne

METHODOLOGY

Study Design

A cross-sectional study design was utilized for this study which was conducted from October 2016 to March 2017.

Ethical Considerations

Informed Consent

The study was initiated upon the approval of the Institutional Ethics and Review Board (IERB). Subjects were duly informed regarding the nature and purpose of the study. Before initiating data collection, all subjects were informed of the purpose and methods of the study. Consent was obtained using a standard consent form.

Confidentiality and Security of Information

All information gathered was kept confidential and used solely for the purpose of the study.

Non-maleficence

Non-maleficence was practiced throughout the course of the study. All subjects were duly informed of the study design and were given the option not to participate in the study if they deemed any activity or process to be offensive.

Beneficence

All the data that was gathered from the study may be used to improve management and intervention among patients with Acne vulgaris.

Plagiarism

All materials that were used in the study were properly cited.

Study Setting

The study was conducted at the clinics of a tertiary government hospital

Study Population

The subjects of the study included patients clinically diagnosed with acne vulgaris, aged 13-50 years of age.

Inclusion Criteria:

- Filipino patients who are aged 13-50 years old;
- Able to read and write in English and/or Tagalog;
- Diagnosis of Acne Vulgaris;
- Seen at the clinics of a tertiary government hospital;

Exclusion Criteria:

- Patients with history of other chronic dermatoses
- Diagnosed psychiatric disorder
- History of oral tretinoin treatment

Sample Size

A sample size of 92 patients diagnosed with Acne Vulgaris (46 adolescent and 46 adult), satisfying the inclusion/exclusion criteria was needed based on a 5% significance level, 80% power and observed proportions. The average number of newly diagnosed Acne Vulgaris patients seen at clinics of a tertiary government hospital in 6 months is, however, only approximately 90. Hence, the adjusted total sample size was at least 46 patients (at least 23 per group).

Study Protocol

Recruitment of Subjects

Acne vulgaris patients who were eligible for inclusion in the study using a checklist was referred by the residents in the clinics to the principal investigator. Those who did not fulfill all the inclusion criteria will not be included. And those who fulfilled at least one exclusion criterion were not included.

Phase I: Obtaining Consent and Assent

Patients who have been assessed to be eligible subjects in the study were given a consent form by the principal investigator which they read themselves. Individuals aged 13-17 were given an

assent form which they signed, in addition to the consent form which was signed by the parent/legal guardian. The principal investigator was present during this time to answer question regarding the study. Patients who voluntarily gave their consent were examined further.

Phase II: Dermatologic Assessment

A more comprehensive history regarding the subject's acne was done by the principal investigator. A case report form was used. The subjects were assigned a subject identification number to maintain confidentiality during the study. They subsequently underwent a dermatologic evaluation using the Global Acne Grading System. All subjects were recorded in the Subject Enrollment Log form.

Phase III: Administration of HADS/HADS-P

After comprehensive dermatologic evaluation, the subjects were asked by the co-investigator to choose between the English and Filipino version of the Hospital Anxiety and Depression Scale which they completed. The test was self-administered and the subjects were given five minutes to complete the questionnaire. The co-investigator was present oversee and time the process. Scores were calculated by the co-investigator using the HADS scoring guide.

Phase IV: Disclosure of HADS/HADS-P Result to the Subject

After calculation of the HADS/HADS-P scores, the results were relayed by the co-investigator to the subject. Those with scores equal to or more than 11 were given the option to seek consult with a psychiatrist for further evaluation.

Operational Definitions

1. Adolescent acne – Acne occurring in individuals less than 25 years old
2. Adult acne – Acne occurring in individuals 25 years old and older

Variables

Independent Variables

- Age – chronological age in years
- Sex – male or female
- Age of onset – age in years when acne first occurred
- Duration of Acne – number of years of patient has had acne
- Previous treatment – over-the-counter medications, whether topical or oral that have been previously tried without a dermatologist's prescription. This excludes oral tretinoin which is part of the exclusion criteria.
- Acne Severity – severity of acne based on the Global Acne Grading System (GAGS)

Dependent Variable

- Risk of Anxiety and Depression – Numerical score of the answers from the Hospital Anxiety and Depression Scale/ Hospital Anxiety and Depression Scale-Pilipino (HADS/HADS-P)

Data Analysis

All forms and questionnaires were checked for completion and accuracy by the co-investigator immediately after the subjects have answered the HADS/HADS-P. All valid data from the subjects were included in the analysis. Missing values were not replaced or estimated during the statistical analysis. Checks for homogeneity of sample population and normality assumption of quantitative patient demographic and clinical characteristics were done. Summary statistics were presented in tables or graphs as mean $\pm$ SD or median (range) for quantitative characteristics (age, age of onset, duration of acne) and as n (%) for qualitative outcome measures (gender, previous treatment, acne severity, risk of anxiety and depression. Independent Students *t*-test was used to compare two means between the adolescent and adult acne patients. Chi-square test, Fisher's exact test, or Yates' chi-square test was used to compare proportions. The chi-square test of

association was done to compare the risk of anxiety and depression between adolescent and adult subjects. Odds ratio and a 95% confidence interval were computed. A p-value of ≤ 0.05 was used to assess for statistical significance. Stata v13 was used to analyze the data.

RESULTS

In this study, 23 adolescent and 23 adult patients diagnosed with acne vulgaris seen in the outpatient clinic and Skin Center in a tertiary government hospital were examined. Among the adolescents included, 56.5% were female and 43.5% were male with an average age of 19.9 ± 3.3 years, ranging from 13-24 years old. The adult subjects were consisted of 87% females and 13% males with an average age of 30.5 ± 5.8 years, ranging from 25-47 years old. The most frequent age of onset of acne was between 11 to 19 years among adolescents and 12 to 18 years among adults (91.3% vs 56.5%; $p=0.017$). Duration of acne among adolescents was 4.4 ± 3.0 years and 10.3 ± 6.4 years among adults ($p<0.0001$). Approximately 47.8% of adolescents and 52.5% of adults had previous treatment ($p=0.768$). There were statistically significant differences in the age ($p<0.0001$), gender ($p=0.047$), age of onset of acne ($p=0.020$), and duration of acne ($p<0.0001$) between the adolescents and adults. Both groups were comparable with respect to previous treatment ($p=0.078$).

Table 1: Demographic profile of adolescent and adult Acne vulgaris patients

Demographic Characteristics	Adolescent n = 23	Adult n = 23	p-value
Age in years, mean $\pm$ SD	19.9 $\pm$ 3.3	30.5 $\pm$ 5.8	0.000*
Age in years, n (%)			
<10	9 (39.1%)	-	0.000*
10-19	14 (60.9%)	4 (17.4%)	
20-25	-	16 (69.6%)	
26-35	-	2 (8.7%)	
36-45	-	1 (4.3%)	
Gender, n (%)			
Female	13 (56.5%)	20 (87.0%)	0.047*
Male	10 (43.5%)	3 (13.0%)	
Age of onset in years, mean $\pm$ SD	15.7 $\pm$ 2.8	18.9 $\pm$ 5.6	0.020*
Age of onset in years, n (%)			
10-19	21 (91.3%)	13 (56.5%)	0.017*
20-25	2 (8.7%)	9 (39.1%)	
26-35	-	1 (4.3%)	
Duration of acne in years, mean $\pm$ SD	4.4 $\pm$ 3.0	10.3 $\pm$ 6.4	0.000*
Previous treatment, n (%)			
Yes	11 (47.8%)	12 (52.2%)	0.768
No	12 (52.2%)	11 (47.8%)	

* Significant at 5% level

In the adolescent group, subjects had moderate (56.5%) or mild (43.5%) acne. Adults had mild (60.5%), moderate (30.4%) or severe (8.7%) acne. No significant differences in the severity were found in both groups ($p=0.346$).

Table 2: Acne severity grading of adolescent and adult patients in the GAGS score

GAGS Score	Adolescent n = 23	Adult n = 23	p-value
31 – 38 (Severe)	-	2 (8.7%)	0.346
19 – 30 (Moderate)	13 (56.5%)	7 (30.4%)	
1 – 18 (Mild)	10 (43.5%)	14 (60.9%)	

There was a significant difference in the risk of anxiety and depression between adolescents and adults ($p=0.007$). There were 21 adolescents (93%) and 12 adults (52.2%) who were at risk. Of the subjects included in the study, adolescents were approximately 10 times more likely to be at risk of anxiety and depression (OR=9.625, 95% CI: 1.821, 50.866).

Table 3: Risk of anxiety and depression of adolescent and adult acne vulgaris patients

HADS/HADS-P Score	Adolescent n = 23	Adult n = 23	p-value
≥ 11	21 (91.3%)	12 (52.2%)	0.007*
<11	2 (8.7%)	11 (47.8%)	

* Significant at 5% level

Among those who had a risk of anxiety and depression, majority were female (52.4% adolescent and 91.7% adult; $p=0.027$). Of the 21 adolescents, acne was graded as moderate (57.1) or mild (42.9%). Of the 12 adults, acne was severe (8.3%), moderate (25%), or mild (66.7%). However, there was insufficient evidence to show a significant difference in the severity of acne between the two groups ($p=0.444$).

Table 4: Risk of anxiety and depression (HADS ≥ 11) of adolescent and adult acne vulgaris patients by gender and acne severity (GAGS grading)

	Adolescent n = 21	Adult n = 12	p-value
Gender, n (%)			
Female	11 (52.4%)	11 (91.7%)	0.027*
Male	10 (47.6%)	1 (8.3%)	
Severity, n (%)			
Severe	-	1 (8.3%)	0.444
Moderate	12 (57.1%)	3 (25.0%)	
Mild	9 (42.9%)	8 (66.7%)	

* Significant at 5% level

DISCUSSION

The association of acne with psychological problems such as low self esteem, anxiety, depression, and suicidal ideation has been documented in several studies across different cultures^{1,2,4,6,8}. However, since most of these studies focus on the adolescent population, not much is known about the psychosocial impact on acne on adult patients.

In this study, majority of the subjects in both groups were female. Among the adolescents, more than half were female. According to previous studies, more adolescent males are affected with acne vulgaris and have more severe disease compared to females^{8,18}. However, it was also found that females are more affected psychosocially, hence, seek consult twice as much as males⁸. In adults, the prevalence of acne is higher among women^{18,19}. While most males will have improvement and resolution of symptoms by their mid-twenties, females may continue to have acne even beyond 40 years of age¹⁹. Studies have cited that acne among the older female age group may be attributed to several factors such as hormonal imbalances, use of cosmetic products, and drugs^{10,11,19}.

Age on onset of acne among the majority of the subjects is between 11 to 19 which is consistent with previous studies done²⁰⁻²¹. A minority of adult subjects had later onset acne. Studies show that among those with adult acne, most cases are persistent (i.e. progressing from adolescence) while a smaller percentage experience late onset acne^{10,11,18}.

Among the study subjects for both groups, there was no significant difference in having previous treatments, including both physician-prescribed and over the counter medications. However, previous studies showed significant differences between adolescents and adults with regards to seeking treatment. Law et al (2009), found that less than 40% of adolescents sought treatment for acne. In a study by Poli et al (2001), they found that only 22% of adults were undergoing treatment. Differences may be attributed to perception of acne and its effects on self-image. Due to significant negative psychosocial effects of acne on adolescents, they may be more likely to seek treatment.

Severity of acne did not show any significant differences between the study groups. In a study done by Shen et al (2012), they showed that severity of acne was similar between adolescent and persistent acne, with late-onset acne having milder severity. In other studies, it has been found that adolescent acne presents with mostly comedonal lesions while adult acne is characterized by more inflammatory lesions^{11,18,19}. However, severity grading using standardized assessment tools were not employed.

A significant difference was found between adults and adolescents in their risk of anxiety and depression. In this study, adolescent acne patients had higher risk and were about 10 times more likely to be at risk. Findings were consistent with previous studies documenting the association of negative psychological effects for both groups. Majority of these studies on the psychosocial effects of acne have focused on the adolescent age group because adolescence is the stage of maximal development physically, psychologically, and socially. Thus, any perceived flaw in the physical appearance may have a significant impact on the self-image of the adolescent. Consequently, this may lead to decreased self-esteem, body image problems, and social withdrawal. This is consistent with a study by Shakoor et al (2012), which found that anxiety and depressive symptoms were most prevalent in the 10 to 19 years old age group and had a decreasing trend as age progresses. In contrast, one study showed increasing trend of depression, with the age group of 36 to 64 years old having the highest prevalence⁸. Negative effects of body dissatisfaction were seen as additional stress to the demands of adulthood. But limited studies have been done regarding adult acne. This may be due to the traditional notion that acne is only prevalent in the adolescent age group. In the recent years, more studies have been done on the epidemiology of adult acne but more research on the psychosocial impact of acne is needed.

Among the subjects who had a risk of anxiety and depression, majority were female in both groups. However more males in the adolescent group were at risk. This is due to the number of adolescent males included in the study. Compared to the 10 males in the adolescent group, only 3 of the

adult group were males. This is consistent with previous findings that adolescent acne in males is more prevalent during adolescence with a decline in the mid-twenties. While in females, acne may be prevalent up to the 4th and 5th decades. Severity of acne among the patients at risk for anxiety and depression were comparable. But among the adolescents, most of those who were at risk had moderate acne while in the adult group, most of those at risk had mild acne. Studies show that severity of acne does not have a linear relationship with severity of anxiety and depression^{1,4,8}. However, this is beyond the scope of this study.

CONCLUSION

Acne vulgaris is associated with negative psychosocial effects on both adolescent and adult patients. The results of this study are consistent with previous findings across cultures. Because acne is not just a physical problem for many patients, it is important for healthcare practitioners, especially dermatologists to be able to see the red flags for psychological comorbidities among patients. The Hospital Anxiety and Depression Scale is a quick and simple tool to use for physicians for risk assessment that can be done in the clinics and can aid in providing a more holistic treatment for patients.

RECOMMENDATION

To make the study more conclusive, a larger sample size is needed.

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