

# The Relationship Between Adolescents' Perception of Family Emotional Atmosphere and Acne Severity, Self-Esteem, and Quality of Life in Adolescents Diagnosed with Acne Vulgaris

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## What is already known on this topic?

- *Acne vulgaris, which significantly affects adolescents, has been closely associated with psychopathology while also having a detrimental effect on their self-esteem and quality of life.*
- *Perceived emotional atmosphere, also called perceived expressed emotion, represents the adolescent's perception of the familial emotional environment and is considered a significant indicator of psychopathological conditions.*

## What this study adds on this topic?

- *The findings of our study revealed an association between the severity of acne and the level of intrusiveness within the family. Furthermore, we identified that a lack of emotional support significantly predicted the quality of life among affected individuals. Furthermore, it was discovered that levels of anxiety and depression might serve as predictors for both self-esteem and quality of life.*

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## ABSTRACT

**Objective:** Acne vulgaris, a prevalent chronic condition among adolescents, significantly impacts patients' quality of life and self-esteem. Our aim was to investigate whether how adolescents perceive their family emotional atmosphere has an impact on their acne severity, quality of life, and self-esteem.

**Materials and Methods:** This study included 118 patients with acne vulgaris who completed various assessments, including a sociodemographic data form, the Acne Quality of Life Scale, the Hospital Anxiety and Depression Scale, the Shortened Level of Expressed Emotion Scale (SLEES) and, the Rosenberg Self-Esteem Scale. The Global Acne Grading System is performed by an experienced dermatologist to determine the severity of acne.

**Results:** Out of 118 patients, 78 (66.1%) were female and 40 (33.9%) were male. The mean age of patients was  $15.2 \pm 1.3$  years. There was a positive correlation between the severity of acne and the levels of perceived intrusiveness subscores of SLEES ( $P = .021$ ,  $r = 0.212$ ). Significant correlations were also observed among quality of life scores, anxiety and depression levels, lack of emotional support (LES) scores, and self-esteem levels. The initial linear regression analysis demonstrated that the level of LES subscores of SLEES and levels of anxiety and depression were predictors of self-esteem. In the second regression analysis, anxiety and depression levels were identified as significant predictors of quality of life.

**Conclusion:** The perceived family emotional atmosphere may be an important factor in evaluating the severity of acne as well as the self-esteem and quality of life of adolescent patients with acne vulgaris.

**Keywords:** Acne vulgaris, adolescent, family emotional atmosphere, quality of life, self-esteem

## INTRODUCTION

Acne vulgaris, a disease of the pilosebaceous unit, is a chronic condition that predominantly affects individuals in the adolescent age group and progresses as moderate or severe acne in approximately 15%-20% of those affected.<sup>1</sup> Although its pathogenesis is multifactorial, the 4 main pathogenetic mechanisms emphasized are increased sebum production, *Cutibacterium acnes* colonization, hyperkeratinization, and inflammation.<sup>2</sup> Furthermore, chronic stress has been implicated in exacerbating acne lesions.<sup>3</sup> Extensive research has also been conducted on the psychological ramifications of acne vulgaris, indicating that adolescents with acne vulgaris tend to exhibit elevated levels of depression and anxiety scores compared to those without the condition.<sup>4</sup>

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The impact of dermatological conditions such as striae distensae, psoriasis, and atopic dermatitis on quality of life has been previously examined in the literature.<sup>5,6</sup> Acne is also a dermatological condition that has been extensively studied for its psychosocial aspects among dermatological diseases. A study conducted during the coronavirus disease 2019 pandemic reported a decrease in the quality of life of patients diagnosed with acne during this period.<sup>7</sup> In addition, numerous studies have provided evidence for the negative effects of acne vulgaris on both quality of life and self-esteem.<sup>8,9</sup>

Expressed emotion (EE) is a general measure of family attitudes that reflects the level of criticism, hostile attitudes, excessive intrusion, and emotional over-involvement by family members toward the patient.<sup>10</sup> In other words, EE refers to a quantifiable indicator of the emotional atmosphere within the household environment.<sup>11</sup> It serves as an indicator of environmental stress, encompassing negative forms of communication such as criticism from family members or excessive intrusion. In this context, EE is considered a characteristic of the family members, not the patient. Perceived EE reflects adolescents' perception of the familial climate.<sup>10</sup> In the literature, it has been reported that EE is effective in the emergence of behavior problems and shaping coping with stress in both clinical and nonclinical populations.<sup>12</sup> In addition, higher levels of parental EE have been identified as a predictor of increased psychopathological symptoms in children and adolescents.<sup>13</sup> Similarly, perceived EE has been associated with lower self-esteem in both psychiatric and nonpsychiatric conditions.<sup>10,14</sup>

While existing literature has established a relationship between acne vulgaris and heightened degrees of depression, anxiety, diminished quality of life, and reduced self-esteem, there is lower number of studies focusing on the specific psychological factors that mediate this association. The main focus of our study was to evaluate whether one of the psychosocial factors that may affect the quality of life and self-esteem of adolescents diagnosed with acne vulgaris has an effect on how the adolescent perceives parental attitudes or family emotional atmosphere. In addition, another aim of our study is to determine whether there is a relationship between the clinical severity of acne and the perceived family emotional atmosphere.

## MATERIALS AND METHODS

### Study Participants

This cross-sectional study included 118 adolescents ranging in the age from 12 to 17 who presented to the hospital with complaints of acne and were diagnosed with acne vulgaris by a dermatologist during the period between February 2021 and December 2021 at the Dermatology Outpatient Clinic of Afyonkarahisar State Hospital in Turkey. A detailed medical history was obtained and recorded for all patients by the dermatologist, considering systemic illnesses and psychiatric disorders. Individuals with a history of systemic diseases (diabetes mellitus, polycystic ovary syndrome, thyroid dysfunctions, etc.), previous or ongoing treatment for acne vulgaris, previous or ongoing psychiatric disorders, and/or the use of psychotropic medications were not included to the study.

The study obtained ethical approval from the Afyonkarahisar Health Sciences University on January 8, 2021 (no. 2021/45).

### Design

Detailed information regarding the study was provided to both the participants and their parents/legal guardians before the commencement of the research, and written informed consent was received. Sociodemographic information of all participants was obtained by filling out the sociodemographic data form. The Global Acne Grading System (GAGS) was used to determine the severity of acne. Other scales that were completed by the patients included the Acne Quality of Life Scale (AQLS), Hospital Anxiety and Depression Scale (HADS), Shortened Level of Expressed Emotion Scale (SLEES), and Rosenberg Self-Esteem Scale (RSS).

### Evaluation Tools

#### Sociodemographic Data Form

The researchers conducting this study developed a sociodemographic form to gather data about the sociodemographic attributes of the participants. This included factors such as age, gender, parental educational background, and socioeconomic status. The socioeconomic status was categorized based on Turkey's official poverty and hunger thresholds for the year 2019.

#### Global Acne Grading System

The GAGS, originally introduced by Doshi, assigns a total score ranging from 0 to 44 to assess the severity of acne.<sup>15</sup> Based on the scores observed, the acne severity of patients can be categorized as follows: 0 indicating no acne, and scores exceeding 39 indicating extremely severe acne.

#### Acne Quality of Life Scale

The AQLS, originally described by Gupta et al,<sup>16</sup> is a tool used to examine both the severity and the psychological effect of acne on patients from their own perspective. In a Turkish sample, Demirçay et al<sup>17</sup> conducted a validity and reliability study of the AQLS. Higher scores on the AQLS indicate a lower quality of life among individuals diagnosed with acne.

#### Hospital Anxiety and Depression Scale

The scale is a self-report questionnaire that was originally described by Zigmond and Snaith.<sup>18</sup> The Turkish version of this scale, including its validity and reliability, was established by Aydemir et al.<sup>19</sup> This scale includes a total of 14 questions, with 7 odd-numbered questions specifically designed to assess the degree of anxiety and the remaining 7 even-numbered questions targeting the degree of depression. Consequently, both the anxiety and depression subscores have a possible range from 0 to 21. Elevated scores on this scale reflect elevated degrees of anxiety and depression among individuals.

#### Shortened Level of Expressed Emotion Scale

The SLEES was originally conducted by Nelis et al.<sup>20</sup> The Turkish version of the scale, including its validity and reliability, was conducted by Vural et al.<sup>21</sup> The scale is a 4-point Likert-type scale that consists of 3 subscales. These subscales assess different aspects related to perceived EE. The first subscale measures the lack of emotional support (LES) and consists of 15 items. The second subscale assesses irritability and comprises 12 items. The third subscale evaluates intrusiveness and consists of 6 items.

### Rosenberg Self-Esteem Scale

The RSS was originally developed by Rosenberg.<sup>22</sup> In a Turkish sample, the validity and reliability of this scale were examined by Çuhadaroğlu.<sup>23</sup> The scale consists of 12 items that assess self-esteem. The first 10 questions specifically evaluate self-esteem, and these were the subscales used in the current study. In this study, the maximum score that could be obtained from the RSS was 40. Elevated scores are indicative of increased levels of self-esteem.

### Statistical Analysis

The statistical analyses were carried out using Statistical Package for the Social Sciences Statistics software, version 22.0 (IBM Corp.; Armonk, NY, USA). Continuous data were presented as mean  $\pm$  standard deviation, and categorical data were presented as frequency and percentage. To determine whether the variables were normally distributed, Kolmogorov–Smirnov test was used. In addition, prior to analyzing the data, the kurtosis and skewness values of the variables were assessed to evaluate the normality assumption. The kurtosis and skewness coefficients fell within the acceptable range of  $-1$  and  $+1$ .<sup>24</sup> The correlations between SLEES scores and scores from other instruments were assessed using Pearson's rank correlation coefficient. The Pearson correlation coefficient was categorized as follows:  $<0.25$  very weak;  $0.26$ – $0.49$  weak;  $0.50$ – $0.69$  moderate;  $0.70$ – $0.89$  high;  $0.90$ – $1.0$  very high. Two separate linear regression analyses were used to determine the effects of various predictors on self-esteem and quality of life (enter model). Multicollinearity was evaluated in linear regression analysis, and the fact that variance inflation factor (VIF) values are less than 5 and "tolerance" values are not greater than 5 and not less than 0.2 indicate that there is no multicollinearity that may adversely affect the power of the regression model.<sup>25</sup> For statistical significance,  $P < .05$  was accepted as the criterion. A post hoc power analysis was conducted to verify the adequacy of the sample size. The analysis was performed using the G\*Power application (Version 3.1.9.3). Based on a sample size of 118 and the values obtained in the study, the findings from the analysis indicate that both regression models have sufficient power (1.00 for RSS and 0.99 for AQLS).

## RESULTS

### Descriptive Statistics and Correlations of Scale Scores

This study involved a total of 78 (66.1%) female and 40 (33.9%) male participants. The mean age of the participants was  $15.2 \pm 1.3$  years, and the mean duration of the disease was  $2.1 \pm 1.5$  years. Table 1 displays the demographic characteristics of the patients as well as the mean values of the GAGS, AQLS, SLEES, RSS, and HADS scores.

The associations between the acne severity, perceived EE levels, quality of life scores, anxiety and depression levels, and self-esteem scores were examined using Pearson's correlation coefficients. Acne severity was only found to have a correlation with perceived intrusiveness levels. Significant associations were found between the total perceived EE and LES scores and quality of life levels, self-esteem scores, and the depression levels. Furthermore, the LES scores, anxiety and depression levels, self-esteem scores, and quality of life levels also exhibited significant correlations with each other in varying proportions,

**Table 1.** Characteristics of Participant and Descriptive Statistics of the Measured Variables

Participant Characteristics (n = 118)	
Gender (%)	
Female	66.1
Male	33.9
Age (years) $\pm$ SD	15.22 (1.39)
Socioeconomic level (%)	
Low	5.9
Middle	83.9
High	10.2
Educational level of the mother (%)	
Primary school	49.1
Secondary school	24.6
High school	19.5
University	6.8
Educational level of the father (%)	
Primary school	31.4
Secondary school	21.2
High school	33.9
University	13.5
Disease duration (years) $\pm$ SD	2.13 (1.57)
GAGS scores (mean $\pm$ SD)	22.64 (6.07)
Mild (%)	31.4
Moderate (%)	58.5
Severe (%)	10.1
AQLS scores (mean $\pm$ SD)	14.74 (5.25)
SLEES total scores (mean $\pm$ SD)	62.23 (15.95)
LES	29.18 (9.48)
Irritability	19.40 (6.92)
Intrusiveness	13.65 (4.09)
RSS scores (mean $\pm$ SD)	29.79 (5.38)
Anxiety Subscale of HADS (mean $\pm$ SD)	8.33 (4.39)
Depression Subscale of HADS (mean $\pm$ SD)	6.09 (3.70)

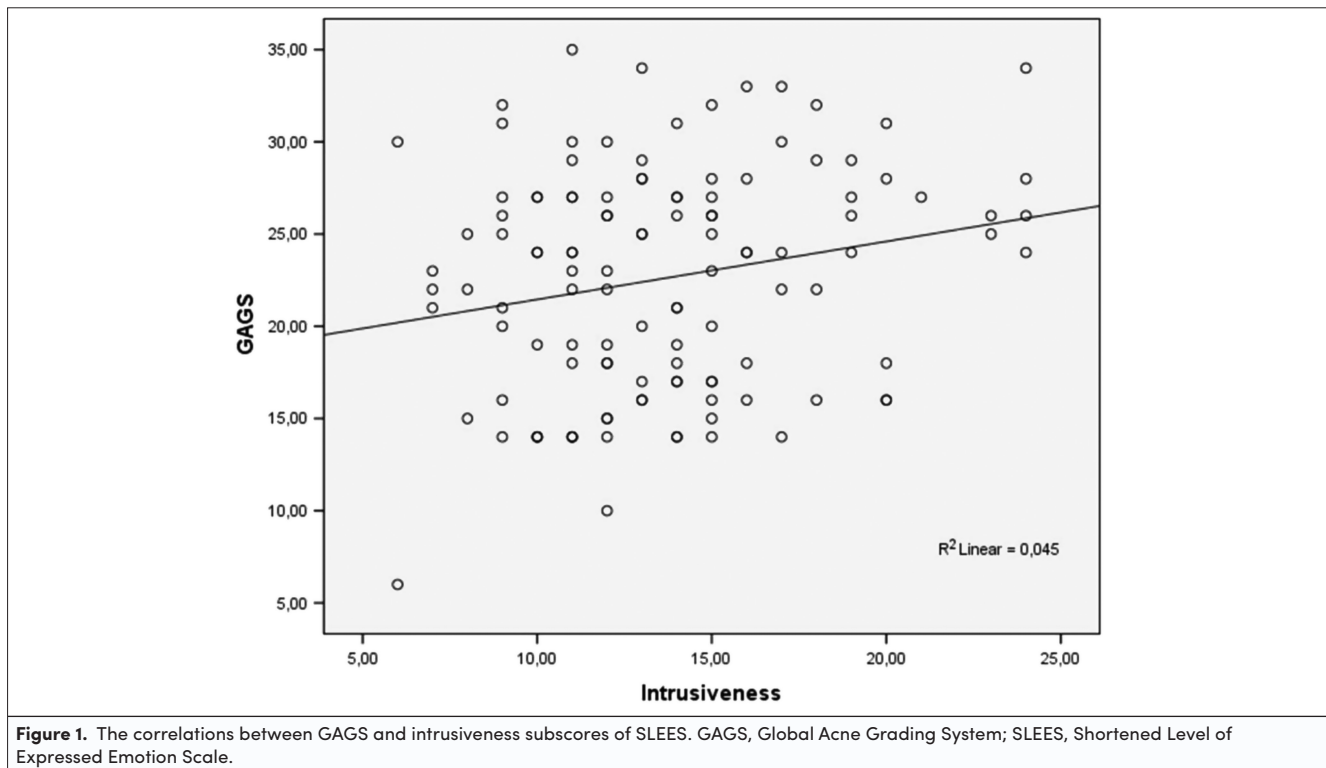
AQLS, Acne Quality of Life Scale; GAGS, Global Acne Grading System; HADS, Hospital Anxiety and Depression Scale; LES, lack of emotional support; RSS, Rosenberg Self-Esteem Scale; SLEES, Shortened Level of Expressed Emotion Scale.

ranging from very weak to moderate (Figure 1 and 2). Table 2 presents the Pearson's correlation coefficients.

### Linear Regression Analyses for Acne Quality of Life Scale and Rosenberg Self-Esteem Scale

To identify predictors of RSS and AQLS scores, 2 linear regression analyses were conducted. The first analysis demonstrated that the LES subscores of SLEES ( $t = -2.81$ ;  $P = .006$ ), anxiety subscores ( $t = -2.55$ ;  $P = .012$ ), and depression subscores of HADS ( $t = -3.20$ ;  $P = .002$ ) significantly contributed to the RSS scores. The amounts by which a 1 point increase in predictive scale scores reduces RSS scores were determined as follows: 0.123 for LES subscores of SLEES, 0.268 for the anxiety subscores of HADS, and 0.415 for the depression subscores of HADS. The model explained 38.3% of the RSS scores ( $R^2$ : 0.405; Adjusted  $R^2$ : 0.383) (Table 3).

The second linear regression analysis revealed that the anxiety subscores ( $t = 2.59$ ;  $P = .011$ ) and the depression subscores of HADS ( $t = 2.86$ ;  $P = .005$ ) significantly influenced the AQLS



scores. The amounts by which a 1 point increase in predictive scale scores increases AQLS scores were determined as follows: 0.284 for the anxiety subscores of HADS, and 0.394 for the depression subscores of HADS. The model explained 28.8% of the AQLS scores ( $R^2$ : 0.313; Adjusted  $R^2$ : 0.288) (Table 4).

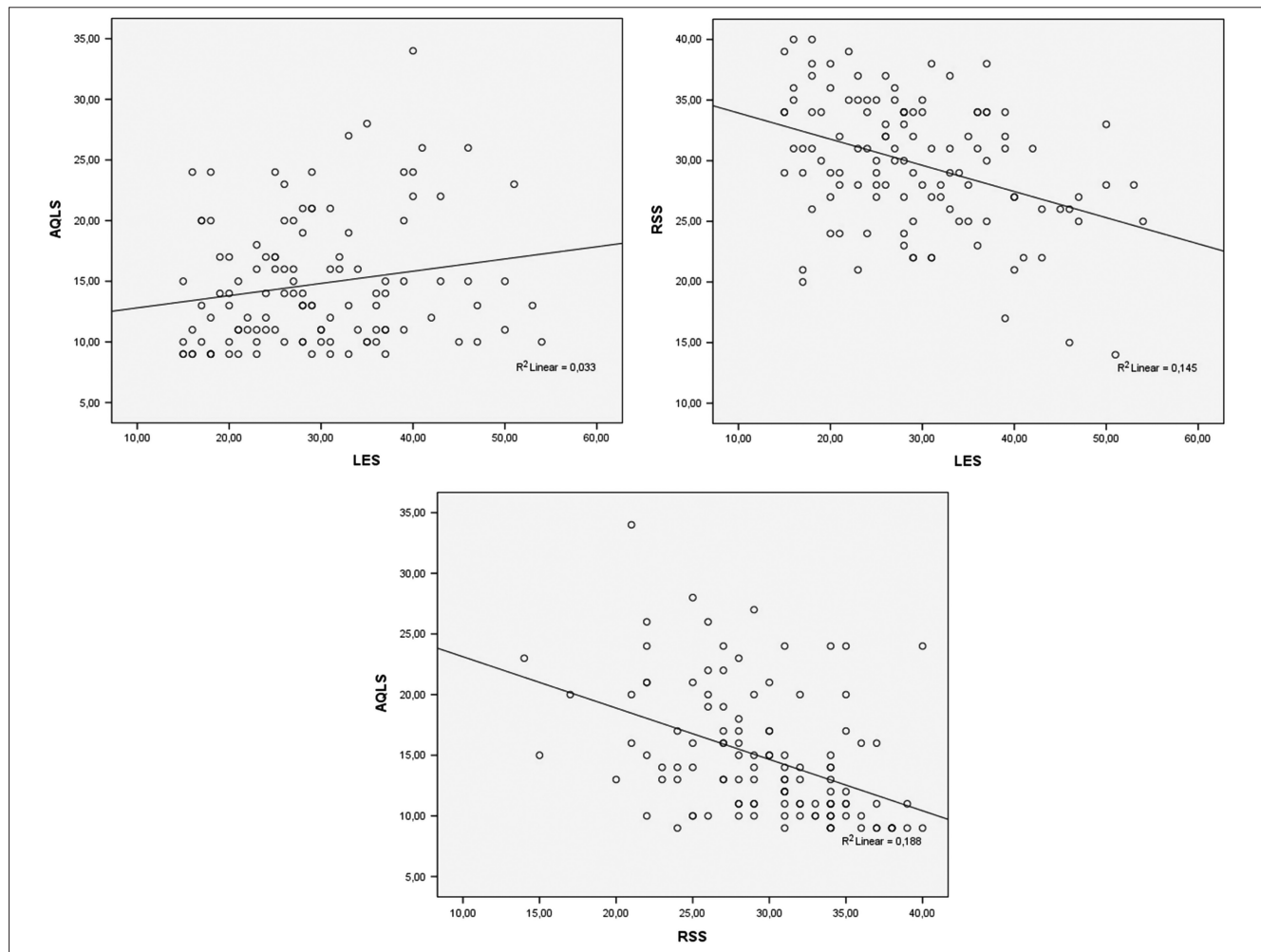
## DISCUSSION

This study aimed to investigate the associations between perceived family emotional atmosphere and the severity of acne, as well as their effect on quality of life and self-esteem. Our findings revealed numerous noteworthy relationships. First, we observed statistically significant positive correlations between acne severity and the perceived intrusiveness scores. Furthermore, we found that levels of the LES as well as the anxiety and depression levels, served as significant predictors of self-esteem scores. Additionally, the anxiety and depression levels were identified as significant predictors of quality of life scores.

Approximately half of the adolescents diagnosed with acne vulgaris reported that their interpersonal relationships were compromised due to acne.<sup>26</sup> Parental intrusiveness is known to negatively affect the development of self-regulation skills regarding interpersonal relationships.<sup>27</sup> In the present study, we observed an association between the acne severity and the perceived level of intrusiveness. Considering the data in the literature, the relationship between level of perceived intrusiveness and acne may be mediated by difficulties in interpersonal relationships. With more research supporting our findings, psychotherapeutic interventions targeting social relationships in acne patients could be beneficial in terms of acne severity and perceived intrusiveness levels.

Acne vulgaris may affect many areas associated with quality of life, including interpersonal relationships and social life.<sup>28</sup> Although several factors affect the quality of life in individuals diagnosed with acne vulgaris, some of them are more prominent than others. In a study conducted with 61 adolescents with acne vulgaris and 38 adolescents without acne vulgaris, it was stated that there was no association between acne severity and quality of life and that quality of life was associated with the degree of anxiety and depression.<sup>9</sup> Another study that included 1531 adolescents aged 11-19 years showed that mostly low self-esteem and feelings of unworthiness contributed to reduced quality of life.<sup>29</sup> To the best of our knowledge, the relationship between perceived family climate and quality of life in acne patients has not been shown previously. However, it was reported that SLEES scores were a mediator factor in the association between headache severity and quality of life.<sup>30</sup> In our study, low quality of life was not correlated with the severity of acne, while it was correlated with low self-esteem, increased degrees of anxiety and depression, and perceived LES. A regression analysis suggested that among all these factors, only anxiety and depression levels predicted the quality of life. In the light of these data, we suggest that there is a need for more studies examining the role of perceived LES and self-esteem on quality of life in the context of anxiety and depression.

It is known that acne vulgaris negatively affects the self-esteem of patients.<sup>8</sup> We found that low self-esteem was correlated with elevated degrees of anxiety and depression, low quality of life, and LES. A regression analysis indicated that degrees of anxiety and depression and LES could predict self-esteem. The lack of any study investigating the association between acne vulgaris and perceived family emotional



**Figure 2.** The correlations between AQLS, RRS, and LES subscores of SLEES. AQLS, Acne Quality of Life Scale; LES, lack of emotional support; RRS, Rosenberg Self-Esteem Scale; SLEES, Shortened Level of Expressed Emotion Scale.

**Table 2.** The Correlations Between Acne Severity and Scales' Scores

		1	2	3	4	5	6	7	8	9
1. GAGS	<i>r</i>	1.00								
	<i>P</i>									
2. Total SLEES scores	<i>r</i>	0.156	1.00							
	<i>P</i>	.091								
3. LES	<i>r</i>	0.072	<b>0.853</b>	1.00						
	<i>P</i>	.438	<b>&lt;.001</b>							
4. Irritability	<i>r</i>	0.136	<b>0.767</b>	<b>0.395</b>	1.00					
	<i>P</i>	.142	<b>&lt;.001</b>	<b>&lt;.001</b>						
5. Intrusiveness	<i>r</i>	<b>0.212</b>	<b>0.620</b>	<b>0.335</b>	<b>0.378</b>	1.00				
	<i>P</i>	<b>.021</b>	<b>&lt;.001</b>	<b>.009</b>	<b>&lt;.001</b>					
6. AQLS	<i>r</i>	0.054	<b>0.199</b>	<b>0.182</b>	0.141	0.114	1.00			
	<i>P</i>	.562	<b>.032</b>	<b>.049</b>	.129	<.221				
7. RSS	<i>r</i>	0.101	<b>-0.277</b>	<b>-0.381</b>	-0.091	-0.046	<b>-0.434</b>	1.00		
	<i>P</i>	.280	<b>.002</b>	<b>&lt;.001</b>	.332	.626	<b>&lt;.001</b>			
8. HADS-A	<i>r</i>	0.052	0.181	<b>0.206</b>	0.080	0.094	<b>0.442</b>	<b>-0.462</b>	1.00	
	<i>P</i>	.574	.050	<b>.026</b>	.391	.314	<b>&lt;.001</b>	<b>&lt;.001</b>		
9. HADS-D	<i>r</i>	0.023	<b>0.319</b>	<b>0.312</b>	<b>0.248</b>	0.098	<b>0.474</b>	<b>-0.528</b>	<b>0.445</b>	1.00
	<i>P</i>	.809	<b>&lt;.001</b>	<b>.001</b>	<b>.007</b>	.292	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	

Pearson correlation analysis was performed. Bold values denote statistical significance.

AQLS, Acne Quality of Life Scale; GAGS, Global Acne Grading System; HADS-A, Hospital Anxiety and Depression Scale Anxiety Subscale; HADS-D, Hospital Anxiety and Depression Scale Depression Subscale; LES, lack of emotional support; RSS, Rosenberg Self-Esteem Scale; SLEES, Shortened Level of Expressed Emotion Scale.



**Table 3.** Independent Predictors of the Rosenberg Self-Esteem Scale Score

	Unstandardized Coefficients		Standardized Coefficients	t	P	95% CI
	Beta	Standard Error	Beta			
(Constant)	40.593	1.570	–	25.855	<b>&lt;.001</b>	37.483–43.704
LES subscale of SLEES	–.123	.044	–.217	–2.816	<b>.006</b>	(–.210)–(–.036)
Acne Quality of Life Scale	–.166	.089	–.162	–1.873	.064	(–.342)–(–.010)
Anxiety subscale of HADS	–.268	.105	–.218	–2.557	<b>.012</b>	(–.475)–(–.060)
Depression subscale of HADS	–.415	.129	–.286	–3.207	<b>.002</b>	(–.671)–(–.159)

Linear regression analysis was used. Bold values denote statistical significance.  
HADS, Hospital Anxiety and Depression Scale; LES, lack of emotional support; SLEES, Shortened Level of Expressed Emotion Scale.

**Table 4.** Independent Predictors of Acne Quality of Life Scale

	Unstandardized Coefficients		Standardized Coefficients	t	P	95% CI
	B	Standard Error	Beta			
(Constant)	15.828	4.082	–	3.877	<b>&lt;.001</b>	(7.740)–(23.916)
LES subscale of SLEES	–.014	.047	–.024	–.285	.776	(–.107)–(.080)
Anxiety subscale of HADS	.284	.110	.237	2.591	<b>.011</b>	(.067)–(.502)
Depression subscale of HADS	.392	.137	.277	2.864	<b>.005</b>	(.121)–(.663)
Rosenberg Self-Esteem Scale	–.183	.098	–.187	–1.873	.064	(–.376)–(–.011)

Linear regression analysis was used. Bold values denote statistical significance.  
HADS, Hospital Anxiety and Depression Scale; LES, lack of emotional support; SLEES, Shortened Level of Expressed Emotion Scale.

atmosphere in the published literature precludes any direct comparison of our results. Nonetheless, how a child perceives the attitudes of his/her parents towards him/her explains a significant part of the variance in self-esteem. High parental EE was reported to be associated with more psychopathological symptoms.<sup>13</sup> In line with these findings, we found that LES was significantly correlated with both anxiety and depression levels. Inherent to our study, it's important to acknowledge a diagnostic limitation. The assessment of psychiatric disorders and psychotropic medication usage heavily relies on the patient's self-report, which might introduce recall bias or incomplete information. Therefore, a comprehensive evaluation including psychiatric examinations would enhance the accuracy of identifying anxiety disorders and mood disorders. Overall, data from the current study and the literature suggest that it may be important to evaluate the perceived EE, depression, and anxiety levels to determine self-esteem in patients with acne vulgaris.

There are several limitations to our study. First, we did not employ a structured psychiatric interview to screen for psychopathology. Instead, we relied on self-report measurement tools for psychometric evaluations. Second, the study design was cross-sectional, which restricted our ability to establish causality between variables. Another important limitation is the absence of a control group in our study. Without a control group, we were unable to compare anxiety and depression levels between individuals with acne and those without.

## CONCLUSION

Our study provides results that the perceived parent-child relationship in adolescents with acne vulgaris could potentially play a role in influencing acne severity as well as impacting quality of life and self-esteem. However, there are likely other

variables that may mediate the negative impacts of acne vulgaris on self-esteem and quality of life, which require further investigation in future studies. By considering these additional factors, we can attain a more detailed perspective of the complex interplay between psychosocial factors and the experience of acne vulgaris in adolescents. In addition, it is important to monitor an adolescent diagnosed with acne vulgaris in terms of both the clinical parameters of acne (acne severity) and its psychosocial effects (quality of life, self-esteem). During the patient's follow-up process, factors such as the parent-adolescent relationship, parental attitudes, and how the adolescent perceives parental attitudes should be taken into consideration. Larger-scale studies involving clinical psychiatric interviews with adolescents diagnosed with acne can contribute to a better understanding of this topic.

**Ethics Committee Approval:** This study was approved by Ethics Committee of Afyonkarahisar Health Sciences University, (Approval No: 2021/45, Date: 8.01.2023).

**Informed Consent:** Written informed consent was obtained from the legal guardians of patients who agreed to take part in the study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – H.A.G., D.G.; Design – H.A.G., D.G.; Supervision – S.K.Y.; Resources – S.K.Y., D.G.; Materials – S.K.Y., D.G.; Data Collection and/or Processing – S.K.Y.; Analysis and/or Interpretation – H.A.G.; Literature Search – H.A.G.; Writing – H.A.G.; Critical Review – S.K.Y., D.G.

**Declaration of Interests:** The authors have no conflict of interest to declare.

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