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Impact of Acne Vulgaris on the Quality of Life of Patients Presented to Nishtar Hospital Multan Outpatient Department

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ABSTRACT

Acne vulgaris is one of the most prevalent dermatological conditions globally, yet its psychosocial burden is often underestimated in clinical settings. **Objectives:** To assess the impact of acne vulgaris on quality of life of patients. **Methods:** This cross-sectional study enrolled 145 patients (aged 14–50 years) with acne vulgaris at the Dermatology OPD, Nishtar Hospital, Multan. Acne severity and quality of life were assessed using GAGS and DLQI, respectively. Statistical tests included chi-square, ANOVA, and logistic regression, with significance set at $p < 0.05$. **Results:** Of 145 patients, 81(55.9%) were female and 64(44.1%) male. Based on GAGS, 45 (31.0%) had mild, 63 (43.4%) moderate, and 37 (25.5%) severe acne; mean GAGS score was 23.12 ± 9.89. DLQI assessment revealed no impact in 13 (9.0%), mild in 33 (22.8%), moderate in 26 (17.9%), very large in 48 (33.1%), and huge in 25 (17.2%); mean DLQI was 11.79 ± 8.43. DLQI scores increased with acne severity: mild 8.40 ± 9.34, moderate 11.44 ± 7.53, severe 16.49 ± 6.54 ($F=10.71$, $p<0.001$). Very large DLQI impact was seen in 11.1%, 33.3%, and 59.5% of mild, moderate, and severe cases, respectively. Independent predictors of high DLQI impact included age 31–50 years, unemployment, and low socioeconomic status ($\chi^2=38.70$, $df=8$, $p<0.001$). **Conclusions:** This study demonstrates that the severity of acne vulgaris is significantly associated with greater impairment in dermatology-specific quality of life. Independent predictors of poor quality of life include age, gender, occupation, and socioeconomic status.

INTRODUCTION

Acne vulgaris is one of the most widespread dermatological conditions and has been ranked as the eighth most common disease globally. Its burden is particularly high among adolescents and young adults, with global age-standardized prevalence increasing from 8,563.4 per 100,000 in 1990 to 9,790.5 per 100,000 in 2021 [1]. Peak prevalence occurs during adolescence, especially in those aged 15–19 years, affecting up to 85% of late pubertal boys and a slightly lower proportion of girls [2, 3]. Among young adults aged 16–24, nearly 28% are affected, while in adults aged 25–39, the prevalence remains substantial at approximately 19% [2, 4]. In Pakistan, the estimated prevalence stands at 5%, making it a common reason for dermatological consultations [5]. Beyond its physical presentation, acne is strongly associated with psychological and social consequences that often exceed its clinical severity [6]. The quality-of-life impact of acne vulgaris is shaped by clinical severity, emotional health, self-perception, and demographic factors. Even mild acne can lead to significant distress due to perceived disfigurement. Anxiety, depression, and sleep disturbances are common and often influence life quality more than lesion count [7, 8]. Social withdrawal, impaired relationships, and reduced academic or professional performance are frequently reported. Females tend to be more affected by appearance concerns, while males report

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physical discomfort. Older adults often experience greater emotional burden than younger individuals [9]. The Dermatology Life Quality Index (DLQI) is a validated tool used to assess the impact of skin conditions like acne vulgaris on daily life. It covers symptoms, emotions, social and work activities, and treatment-related concerns. Widely used in both clinical and research settings, it offers a comprehensive measure of well-being [10]. Compared to other scales, the DLQI is more broadly validated. Higher scores reflect greater burden, especially with severe, long-standing acne, scarring, and pigmentation [11]. Given the high prevalence of acne vulgaris and its documented psychological and social burden, especially among adolescents and young adults in South Asia, there is a pressing need for local data to understand its broader impact. Despite being a common condition, limited research from Pakistan has explored how acne affects patients' quality of life using validated tools.

Although acne vulgaris is highly prevalent and increasingly recognized for its psychosocial consequences, there remains limited region-specific evidence from Southern Punjab assessing its impact on patients' quality of life using validated instruments such as the Dermatology Life Quality Index (DLQI). Most local studies have either focused primarily on clinical severity or included restricted demographic groups, with insufficient exploration of socioeconomic and occupational determinants of psychosocial burden. Furthermore, comprehensive analysis integrating acne severity with demographic predictors of impaired quality of life remains underreported in this setting. This highlights the need for context-specific data to guide holistic, patient-centered acne management strategies. This study aims to assess the quality-of-life impact of acne vulgaris using the Dermatology Life Quality Index (DLQI) and to identify demographic and clinical factors that influence this burden, providing evidence to support more comprehensive, patient-centered acne care.

METHODS

This analytical cross-sectional study was carried out in the Dermatology Unit of Nishtar Hospital, Multan, a tertiary-level referral center serving a large population in southern Punjab. Data collection took place over six months from June to November 2024. Ethical approval was obtained from the Institutional Review Board (Ref. No. 7064). A total of 145 patients were enrolled through non-probability consecutive sampling. All dermatology outpatient attendees during the study period were evaluated, and those meeting the eligibility criteria were enrolled until the required number was reached. Informed consent was taken from all the participants. Sample size was calculated with a 95% confidence level, 9.7% prevalence, and 4.5% precision [12]. The sample size for this study was calculated using the standard formula for prevalence-based studies, expressed as $n = Z^2 \times P \times (1 - P) / d^2$ [13]. GAGS has demonstrated excellent psychometric properties with high internal consistency (Cronbach's α = 0.947) and excellent intra-rater reliability (ICC = 0.946, 95% CI: 0.918–0.966 [14]. The Dermatology Life Quality Index (DLQI) is a standardized and validated instrument consisting of 10 items designed to evaluate the quality-of-life impact of dermatological conditions such as acne. It assesses various domains, including emotional well-being, interpersonal interactions, daily routines, academic or occupational functioning, and treatment-related burden. Each item is rated on a 4-point Likert scale (0 to 3), producing a cumulative score between 0 and 30. Scores are interpreted as follows: 0–1 reflects no impact, 2–5 mild impact, 6–10 moderate impact, 11–20 substantial impact, and 21–30 denotes a very severe impact on the individual's quality of life [10]. Multiple validation studies have confirmed excellent psychometric properties, with internal consistency ranging from Cronbach's α=0.673 to 0.997 (mean = 0.834), with 95.3% of studies reporting values above the acceptable threshold of ≥0.70. Test-retest reliability shows strong correlations (ICC between 0.77-0.98) [11]. A face-to-face structured interview was conducted by the principal investigator in a dedicated consultation room to ensure privacy. Patients were asked a questionnaire in their preferred language. The answers were recorded directly into a predesigned data collection proforma. Data were analyzed using SPSS version 26.0. Continuous variables (e.g., age, GAGS, DLQI scores) were expressed as mean ± standard deviation, while categorical variables (e.g., gender, acne severity, DLQI categories) were presented as frequencies and percentages. Associations between acne severity and DLQI categories were assessed using Chi-square and one-way ANOVA. Before conducting ANOVA, normality of continuous variables was assessed using the Shapiro-Wilk test. Multivariable logistic regression to identify independent predictors of high QoL impairment. A p-value ≤0.050 was considered statistically significant.

RESULTS

Among the 145 patients enrolled, 80 (55.2%) were aged 14–30 years, and 81 (55.9%) were female. The most frequently involved site was the face and neck (76; 52.4%). Most had acne for 1–3 years (99; 68.3%). The mean Global Acne Grading System (GAGS) score was 23.12 ± 9.89. Moderate acne was most common (63; 43.4%). The Dermatology Life Quality Index (DLQI) revealed a mean score of 11.79 ± 8.43, with 48 (33.1%) reporting a very large impact and 25 (17.2%) reporting an extremely large impact on quality of life (Table 1).

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Table 1: Baseline Characteristics of the Study Population (N = 145)

Variables	Frequency (%)
Age Group	
14–30 years	80 (55.2%)
31–50 years	65 (44.8%)
Gender	
Male	64 (44.1%)
Female	81 (55.9%)
Duration of Disease	
1–3 years	99 (68.3%)
More than 3 years	46 (31.7%)
Site of Acne Lesions	
Face and Neck	76 (52.4%)
Chest	43 (29.7%)
Back	26 (17.9%)
Marital Status	
Married	63 (43.4%)
Unmarried	63 (43.4%)
Divorced/Widowed	19 (13.1%)
Educational Level	
Primary	33 (22.8%)
Matriculation	46 (31.7%)
Intermediate	41 (28.3%)
Graduation or Higher Education	25 (17.2%)
Occupation	
Student	40 (27.6%)
Employed	59 (40.7%)
Unemployed	23 (15.9%)
Homemakers / Non-Working Adults	23 (15.9%)
Socioeconomic Status	
Low (≤ PKR 50,000)	23 (15.9%)
Middle (50,001–120,000 PKR)	60 (41.4%)
High (> PKR 150,000)	62 (42.8%)
Acne Severity (GAGS Classification)	
Mild	45 (31.0%)
Moderate	63 (43.4%)
Severe	37 (25.5%)
DLQI-Based QoL Impact	
No Effect (0–1 score)	13 (9.0%)
Mild Effect (2–5 score)	33 (22.8%)
Moderate Effect (6–10 score)	26 (17.9%)
Very Large Effect (11–20 score)	48 (33.1%)
Extremely Large Effect (21–30 score)	25 (17.2%)

A significant association was observed between acne severity and quality-of-life impairment (χ^2=38.70, df=8, p<0.001). No DLQI impact was reported by 10 (22.2%) with mild acne, 3 (4.8%) with moderate, and none with severe acne. Very large DLQI impact was most frequent in severe acne (22; 59.5%) (Table 2).

Table 2: Association Between Acne Severity and Quality of Life Impact (DLQI Categories)

DLQI Impact on Life	Mild Acne (N=45)	Moderate Acne (N=63)	Severe Acne (N=37)	p-Value
No Effect (0–1)	10 (22.2%)	3 (4.8%)	0 (0.0%)	<0.001*
Mild Effect (2–5)	16 (35.6%)	16 (25.4%)	1 (2.7%)	
Moderate Effect (6–10)	7 (15.6%)	13 (20.6%)	6 (16.2%)	
Very Large Effect (11–20)	5 (11.1%)	21 (33.3%)	22 (59.5%)	
Extremely Large Effect (21–30)	7 (15.6%)	10 (15.9%)	8 (21.6%)	

p≤0.05 indicates statistical significance

A one-way ANOVA demonstrated a significant increase in DLQI scores with acne severity: 8.40 ± 9.34 (mild), 11.44 ± 7.53 (moderate), and 16.49 ± 6.54 (severe) ($F(2,142) = 10.71$, $p<0.001$), with acne severity explaining 13.1% of score variance ($\eta^2 = 0.131$). Another ANOVA across DLQI impact categories was also significant ($F(4,140) = 498.32$, $p<0.001$), with all pairwise comparisons showing statistically significant score differences. In the adjusted regression model, patients aged 31–50 years exhibited significantly higher odds of experiencing dermatology-specific quality-of-life (QoL) impairment compared to those aged 14–30 years (OR = 4.72, 95% CI: 1.35–16.51, p = 0.015). Male gender was also associated with increased DLQI burden (OR = 2.63, 95% CI: 1.06–6.54, p = 0.037). Occupational status revealed strong associations: unemployed individuals had 31.31 times higher odds (95% CI: 2.82–348.13, p = 0.005), and homemakers had 24.17 times higher odds (95% CI: 1.86–313.38, p = 0.015) of high QoL impact compared to students. High socioeconomic status was protective (OR = 0.16, 95% CI: 0.03–0.75, p = 0.020). Moderate acne showed lower odds of high DLQI scores versus mild acne (OR = 0.14, 95% CI: 0.04–0.53, p = 0.004). Other variables were not statistically significant (Table 3).

Table 3: Multivariable Binary Logistic Regression Predicting High DLQI Impact (DLQI >10) Among Acne Vulgaris Patients (N = 145)

Predictor Variable	B	S.E.	Wald	df	p-Value	Adjusted OR (Exp (B))	95% CI for OR
Age group (31–50 vs 14–30 years)	1.552	0.639	5.902	1	0.015*	4.721	1.350 – 16.514
Gender (Female vs Male)	–0.967	0.464	4.344	1	0.037*	0.380	0.153 – 0.943
Marital Status (reference: Married)	—	—	1.205	2	0.548	—	—
Unmarried vs Married	0.875	0.824	1.127	1	0.288	2.398	0.477 – 12.057
Divorced/Widowed vs Married	0.530	0.795	0.445	1	0.505	1.698	0.358 – 8.060
Site of Acne (reference: Face and Neck)	—	—	3.427	2	0.180	—	—
Chest vs Face and Neck	1.171	0.674	3.016	1	0.082	3.224	0.860 – 12.083

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Back vs Face and Neck	0.529	0.738	0.514	1	0.473	1.698	0.399 – 7.215
Education (reference: Primary)	—	—	1.180	3	0.758	—	—
Matric vs Primary	0.741	0.772	0.920	1	0.338	2.098	0.462 – 9.534
Intermediate vs Primary	0.732	0.749	0.956	1	0.328	2.079	0.479 – 9.020
Graduation or Higher vs Primary	0.482	0.756	0.407	1	0.524	1.620	0.368 – 7.134
Occupation (reference: Student)	—	—	9.653	3	0.023*	—	—
Employed vs Student	2.508	1.386	3.276	1	0.070	12.282	0.812 – 185.661
Unemployed vs Student	3.444	1.204	8.205	1	0.005*	31.314	2.817 – 348.125
Homemaker vs Student	3.185	1.307	5.934	1	0.015*	24.166	1.864 – 313.384
Socioeconomic Status (reference: Low)	—	—	7.120	2	0.028*	—	—
Middle vs Low	-0.976	0.517	3.559	1	0.059	0.377	0.137 – 1.039
High vs Low	-1.832	0.787	5.421	1	0.020*	0.160	0.034 – 0.748
Duration of Disease (≥3 vs <3 years)	-0.775	0.523	2.197	1	0.138	0.461	0.165 – 1.284
Severity of Acne (reference: Mild)	—	—	8.833	2	0.014*	—	—
Moderate vs Mild	-1.957	0.672	8.478	1	0.004*	0.141	0.038 – 0.528
Severe vs Mild	-1.032	0.611	2.853	1	0.091	0.356	0.108 – 1.180
Constant	-2.936	1.789	2.692	1	0.101	0.053	—

*Reference categories: Male (Gender), Married (Marital Status), Face & Neck (Site), Primary (Education), Student (Occupation), Low SES (Socioeconomic Status), Mild acne (Severity), <3 years (Duration). *p ≤ 0.050 indicates statistical significance

DISCUSSION

In the present study, a statistically significant association was observed between acne severity and impairment in quality of life, with the mean DLQI score rising from 8.40 ± 9.34 in mild cases to 16.49 ± 6.54 in severe cases (χ^2=38.70, df = 8, p<0.001). A greater proportion of patients with severe acne reported a very large (59.5%) or extremely large (21.6%) impact on daily functioning, compared to 11.1% and 15.6%, respectively, among those with mild acne. These findings align with previous studies, which reported a very large impact in 75.8% of patients with severe acne (mean DLQI: 13.29) and others who observed progressively worsening DLQI scores with increasing severity [15, 16]. Conversely, some studies reported a lower mean DLQI (3.05), likely due to a sample dominated by mild cases [17]. Other literature further supports this relationship; as acne severity increases, emotional distress, embarrassment, and social withdrawal become more common [18, 19]. In this study, patients aged 31–50 years exhibited significantly higher odds of quality-of-life (QoL) impairment than those aged 14–30 years, which contrasts with prevailing literature where adolescents and young adults typically report greater psychosocial burden due to heightened self-image concerns and social sensitivity [20, 21]. Several factors specific to our Pakistani context may explain this unexpected pattern. Older patients likely had prolonged acne with accumulated scarring and treatment failures, leading to psychological hopelessness. Working adults face greater occupational appearance pressures compared to students, while Pakistani culture views persistent adult acne as more socially stigmatizing than teenage acne. Many older patients also delayed treatment due to financial constraints or misconceptions that acne is only a teenage condition, resulting in more severe disease and cumulative psychological burden. This contrasts with previous findings highlighting higher DLQI scores in younger age groups, emphasizing the importance of considering cultural and socioeconomic contexts in QoL research. In terms of gender, the present findings revealed greater QoL disruption among male patients, diverging from studies that consistently show females experiencing higher psychological distress despite often having milder acne [22-24]. These inconsistencies may reflect context-specific factors such as healthcare-seeking behaviors, sociocultural expectations, or differential coping strategies. In the present study, neither duration of acne nor site of involvement showed a statistically significant association with DLQI scores in the adjusted model. This contrasts with findings from other studies that reported significantly higher QoL impairment in patients with longer disease duration [25] and those noting that facial or multisite acne was strongly associated with elevated DLQI scores due to the visibility of lesions [26]. In the current sample, this lack of association may be explained by the pattern of severe acne reported predominantly on the chest rather than the face, where its impact on appearance and social perception may be relatively less. Additionally, overlapping psychosocial burden in patients across different lesion sites might have diluted the independent effect of anatomical location on QoL. In the current study, marital status did not show a statistically significant association with quality-of-life impairment, which contrasts with findings where unmarried participants had

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higher DLQI scores [6, 23]. These differences may be attributed to variation in age distribution and cultural expectations regarding appearance. Regarding occupation, both unemployed individuals and homemakers were significantly more likely to report high DLQI scores compared to students. Socioeconomic status was found to be a strong predictor, with lower SES associated with increased QoL impairment, consistent with previous studies that highlighted financial constraints as a barrier to effective acne management [24]. This study offers valuable insights into the psychosocial burden of acne vulgaris in a local clinical context. The use of validated tools such as GAGS and DLQI strengthens the reliability of the findings. A major strength lies in the analysis of multiple demographic and socioeconomic factors as potential predictors. However, certain limitations must be acknowledged, including the single-center design, relatively modest sample size, the cross-sectional nature limiting causal interpretation, and the use of consecutive non-probability sampling, which may restrict generalizability. Despite these, the study emphasizes the need for dermatologists to routinely assess quality of life and address psychosocial concerns as part of comprehensive acne management, especially in vulnerable groups.

This study has certain limitations, including its single-center design, relatively modest sample size, and cross-sectional nature, which limit causal inference and generalizability. The use of non-probability consecutive sampling and self-reported DLQI responses may introduce selection and reporting bias. Additionally, psychological comorbidities such as anxiety and depression were not formally assessed, which could have provided deeper insight into the psychosocial burden. Future multicenter longitudinal studies incorporating mental health screening tools and evaluating treatment-related changes in quality of life are warranted to better understand the long-term psychosocial trajectory of acne vulgaris.

CONCLUSIONS

In conclusion, significant association between acne severity and quality-of-life impairment. Individuals aged 31–50 years, males, unemployed or homemaker groups, and those from lower socioeconomic backgrounds were more likely to experience greater psychosocial burden. These findings highlight the importance of considering both acne severity and sociodemographic factors in assessing quality-of-life impact. Future longitudinal studies are needed to establish causal relationships and track quality of life changes over time with treatment interventions. Clinical practice should incorporate routine DLQI screening in dermatology consultations to identify high-risk patients and implement comprehensive, patient-centered care that addresses both physical and psychosocial aspects of acne management.

Authors' Contribution

Conceptualization: ST
Methodology: ST, N
Formal analysis: ST, MIJ
Writing and Drafting: ST, RT, N, HBA, MS
Review and Editing: ST, RT, N, HBA, MS, MIJ

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

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