# Quality of Life in Turkish Patients with Autoimmune Blistering Diseases: Reliability and Validity of the Autoimmune Bullous Disease Quality of Life and the Treatment of Autoimmune Bullous Disease Quality of Life Questionnaires

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## Abstract

**Background:** The Autoimmune Bullous Disease Quality of Life (ABQOL) and the Treatment of Autoimmune Bullous Disease Quality of Life (TABQOL) questionnaires, which are specific for autoimmune blistering diseases (AIBDs), were developed in Australia. **Aims and Objectives:** The aim of this study was to validate the Turkish version of the ABQOL and TABQOL questionnaires and to assess the reliability of them in the Turkish population. **Materials and Methods:** The Turkish versions of the ABQOL and TABQOL questionnaires were produced by forward–backward translation of the original English version. The patients were requested to complete ABQOL and TABQOL questionnaires on day 0 and after 7 days for a 2nd time sent by post. Furthermore, patients also completed other health-related quality of life scales on day 0. **Results:** A total of 68 patients with AIBDs were recruited. A subset of 20 (29.4%) patients completed the day 7 questionnaire. Both the Turkish versions of the ABQOL and TABQOL questionnaires had a high internal consistency (0.86 and 0.88, respectively) and test–retest reliability (0.87 and 0.87, respectively). The correlation between ABQOL and TABQOL scores was moderate (Pearson's $R = 0.609$). **Conclusion:** We have shown that the Turkish versions of ABQOL and TABQOL questionnaires are valid and reliable instruments. They can be used to measure treatment burden in Turkish AIBD patients.

**Keywords:** Autoimmune blistering diseases, Autoimmune Bullous Disease Quality of Life, health-related quality of life, pemphigoid, pemphigus, Treatment of Autoimmune Bullous Disease Quality of life

## Introduction

Autoimmune blistering diseases (AIBDs) cover a variety of diseases such as pemphigus vulgaris (PV), pemphigus foliaceus (PF), bullous pemphigoid (BP), and epidermolysis bullosa acquisita (EBA). They are all characterized by mucosal and/or cutaneous blistering caused by autoantibodies targeting specific adhesion molecules of the skin/mucosa. PV and BP are the most frequently reported AIBDs in Turkey.[1] The mean incidence of pemphigus was 4.7 new cases per million people per year (95% confidence interval: 4.1–5.4) in the latest prospective research,[2] similar to that of other South-Eastern European countries.[3-5] On the other hand, BP and other subepidermal bullous diseases are thought to have a lower incidence in Turkey, although there are no epidemiological studies of their incidence in Turkey.[1]

Similar to other dermatological diseases, health-related quality of life (HQoL) information is seen as increasingly important in determining therapeutic outcomes of AIBD. This information could help to get a better understanding of AIBD and to

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develop a successful method of treatment. Furthermore, the main therapies used to control AIBDs, such as steroids and immunosuppressive agents, may cause serious adverse effects. One of the main reasons for mortality in patients with AIBDs is therapy-related complications.[6] Therefore, it is important to pay attention to the patients' HQoL and treatment-related quality of life, psychological states, as well as clinical status.

The Autoimmune Bullous Disease Quality of Life (ABQOL) questionnaire was developed in Australia to document the quality of life in patients with AIBD.[7] The Treatment of Autoimmune Bullous Disease Quality of Life (TABQOL) questionnaire represents a quantifiable instrument developed to determine the HQoL impacts of treatments specific for AIBD.[8] These patient-reported outcomes (PROs) are being used in sponsored clinical trials in AIBD. Hence, for Turkish patients to be included in future trials in AIBD, it is important to validate these PROs in Turkish.

The aim of this study was to assess the reliability and validity of Turkish ABQOL and TABQOL questionnaires and document the HQoL in Turkish AIBD patients using the ABQOL and TABQOL questionnaires.

## Materials and Methods

### Autoimmune Bullous Disease Quality of Life–Treatment of Autoimmune Bullous Disease Quality of Life translation

Forward translation of the original versions from English to Turkish was performed by an independent qualified translator. Content validity was obtained by back translation to English by another independent qualified translator with no access to the original English questionnaire. To make sure the translated Turkish questionnaires contained the same meaning as the English questionnaires, the back translation to English was assessed by the Australian investigator and no revision was needed.

To pilot test the questionnaire, we recruited ten AIBD patients to complete the questionnaire. An experienced interviewer pretested patients by asking them what they thought the question was asking, what the answers were, and to explain how they decided their answers. There were no misunderstood points. Subsequently, the final Turkish versions of the ABQOL and TABQOL questionnaires were administered for the study. The 17-item ABQOL and TABQOL questionnaires have four optional answers (each scored from 0 to 3 points), in which a higher score represented a lower HQoL (ranging from 0 to 51 points).[7,8]

### Patient recruitment

We enrolled patients with AIBD who attended the Department of Dermatology and Venereology of a tertiary referral center for AIBD in Turkey, fulfilled the criteria and were willing to participate in the study by signing the consent form. The patients were interviewed during routine medical appointments at the outpatient clinic or on admission to the hospital. The time of recruitment was 12 months between February 2017 and February 2018. The inclusion criteria were diagnosis of AIBD, the age of >18 years, Turkish as native language, and being able to read and understand scales. The medical history regarding the subset of AIBD, disease status, duration of disease, disease severity, and applied treatment was collected. Sociodemographic characteristics of the patients which may influence the quality of life (age, sex, level of income, educational level, and marital status) were also recorded.

Complete remission off therapy, partial remission off therapy, complete remission on minimal therapy, partial remission on

**Table 1: Main demographic characteristics of patients with autoimmune blistering diseases**

| Variable | *n* (%) |
|---|---|
| Patients enrolled (*n*) | 68 |
| Age (years) | 51.14±13.48 |
| Sex, *n* (%) | |
| Male | 24 (35.2) |
| Female | 44 (64.7) |
| Marital status, *n* (%) | |
| Single | 6 (8.8) |
| Married | 53 (77.9) |
| Divorced | 3 (4.4) |
| Widow/widower | 6 (8.8) |
| Income level, *n* (%) | |
| High: Income exceeds expenses | 4 (5.8) |
| Moderate: Income is equal to expenses | 41 (60.2) |
| Low: Income is less than expenses | 23 (33.8) |
| Educational status, *n* (%) | |
| Primary school | 26 (38.2) |
| Secondary school | 10 (14.7) |
| High school | 18 (26.4) |
| Collage | 5 (7.35) |
| Faculty | 8 (11.7) |
| Postgraduate | 1 (1.4) |
| Concomitant diseases, *n* (%) | |
| Yes | 19 (27.9) |
| No | 49 (72.1) |
| Current therapies, *n* (%) | |
| Off therapy | 9 (27.9) |
| Systemic steroids | 49 (72) |
| Topical Steroids | 10 (14.7) |
| Topical antibiotics | 1 (1.4) |
| Doxycycline | 1 (1.4) |
| Dapsone | 5 (7.3) |
| Rituximab | 4 (5.8) |
| Therapies used in disease history, *n* (%) | |
| Systemic steroids | 57 (83.8) |
| Topical Steroids | 20 (29.4) |
| Topical antibiotics | 3 (4.4) |
| Azathioprine | 0 |
| Mycophenolate mofetil | 1 (1.4) |
| Methotrexate | 1 (1.4) |
| Doxycycline | 2 (2.9) |
| Dapsone | 4 (5.8) |
| Rituximab | 24 (35.2) |

minimal therapy, and relapse were evaluated according to the consensus statement on the definitions of disease, endpoints, and the therapeutic response of the pemphigus.[9] Other outcome definitions used in this study are described below:

Complete remission during tapering is defined as the absence of new or established lesions while the patient was tapering therapy at that particular time point.

Partial remission during tapering is defined as the presence of transient new lesions that heal within 1 week while the patient was tapering therapy at that particular time point.

The patients were requested to complete the ABQOL and TABQOL questionnaires on day 0 and after 5–7 days for a 2nd time sent by post. Furthermore, patients also filled out other HQoL scales (the Dermatology Life Quality Index [DLQI], the Short Form-36 [SF-36], the Perceived Health Status [PHS], and the General Health Questionnaire [GHQ]-12), which are commonly used in dermatological diseases and have previously been validated in Turkish patients, on day 0 to evaluate their correlation with the ABQOL and TABQOL.[10-16]

## The Dermatology Life Quality Index

The DLQI is the first quality of life scale developed for dermatological diseases. It contains ten questions in total and the scores range 0–30. High values show that the disease has significant influence on daily life regarding job, school life, leisure activities, and interpersonal relationships. The Turkish version was validated by Ozturkcan *et al*.[10]

## The General Health Questionnaire-12 scale

The GHQ-12 has been developed by Goldberg and Hillier to define mental status in public and in primary health-care services.[11] Although the GHQ-12 was developed to detect general mental disorders, it contains questions evaluating basic symptoms of depression concerning enjoyment, sense of calm, distractibility, and sleeplessness.[12] The validity and reliability of the Turkish version was performed by Kilic *et al*. (Cronbach's alpha = 0.78).[13]

## The Short Form-36

The SF-36 assesses HQoL and composed of 36 items in eight areas as follows: (1) limitations in physical activities, (2) limitations in social activities, (3) limitations in usual role activities, (4) bodily pain, (5) general mental health, (6) limitations in usual role activities, (7) vitality (energy and fatigue), and (8) general health perception. These scales are scored from 0 to 100 following a standard evaluation system.[14] The SF-36 questionnaire was translated into Turkish and validated by Kocyigit *et al*.[15] High scores suggest a better HQoL.[14,15]

## Perceived Health Status

PHS is a Likert-type scale examining general health using a single question. In analyses, Likert scores are classified as 1, 2, and 3 ("worse than good") and 4 and 5 ("good").[16]

Objective disease severity was measured using the validated scores: Pemphigus Disease Area Index (PDAI) for pemphigus, Bullous Pemphigoid Disease Area Index (BPDAI) and BPDAI-pruritus for BP, Autoimmune Bullous Skin Disorder Intensity Score (ABSIS) for pemphigus and pemphigoid, the visual analog scale-pruritus score for DH, Epidermolysis Bullosa Acquisita Disease Area Index for EBA.[9,17-22]

**Table 2: Patient characteristics of autoimmune blistering diseases**

| AIBD | *n* (%) |
|---|---|
| PV | 49 (72) |
| PF | 3 (4.4) |
| BP | 8 (11.7) |
| EBA | 3 (4.4) |
| Dermatitis herpetiformis | 5 (7.3) |
| Clinical stages, *n* (%) | |
| Complete remission during tapering | 13 (19.1) |
| Complete remission on minimal therapy | 14 (20.5) |
| Complete remission off therapy | 11 (16.1) |
| Partial remission during tapering | 2 (2.9) |
| Partial remission on minimal therapy | 3 (4.4) |
| Partial remission off therapy | 2 (2.9) |
| Relapse/flare | 23 (33.8) |
| Total course of disease (months) | 45.44±70.04 |
| Duration of last clinical situation (weeks) | 21.77±47.07 |
| PDAI (*n*=52) | 3.26±9.40 |
| BPDAI (*n*=8) | 15.42±10.16 |
| BPDAI- *P* (*n*=8) | 9.85±9.87 |
| ABSIS (*n*=60) | 4.88±8.49 |
| VAS- pruritus (*n*=5) | 1.20±2.68 |
| EBADAI (*n*=3) | 8.33±6.02 |
| DLQI | 0.41±0.69 |
| PHS | 3.44±0.92 |
| GHQ-12 | 4.57±4.47 |
| SF-36 physical functioning | 57.19±25.93 |
| SF-36 role-physical | 48.07±43.37 |
| SF-36 bodily pain | 70.5±29.73 |
| SF-36 general health | 50.70±12.16 |
| SF-36 vitality | 54.07±15.17 |
| SF-36 social functioning | 57.92±25.92 |
| SF-36 role-emotional | 50.76±30.67 |
| SF-36 mental health | 55.32±12.50 |
| ABQOL | 17.70±8.94 |
| TABQOL | 18.78±9.08 |

ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire, DLQI: Dermatology Life Quality Index, SF-36: Medical Outcome Study 36-item short-form questionnaire, GHQ-12: General Health Questionnaire, PHS: Perceived Health Status, PDAI: Pemphigus Disease Area Index, ABSIS: Autoimmune Bullous Skin Disorder Intensity Score, BPDAI: Bullous Pemphigoid Disease Area Index, BPDAI-p: Bullous Pemphigoid Disease Area Index-pruritus score, EBADAI: Epidermolysis Bullosa Acquisita Disease Area Index, VAS-pruritus: Visual Analog Scale-pruritus, AIBD: Autoimmune blistering diseases, PV: Pemphigus vulgaris, PF: Pemphigus foliaceus, BP: Bullous pemphigoid, EBA: Epidermolysis bullosa acquisita

## Statistics

The statistical analysis was carried out using R-3.5.1 and R-Studios 1.1.456.[23] $P < 0.05$ was used to assess the

significance for all statistical analyses. To define the sample, variables were expressed as mean ± standard deviation and categorical variables as the number and percentage. To determine the relationship between the two variables, the Pearson's correlation coefficient was used when the assumption of normality was provided and Spearman's ρ correlation coefficient was used when not. Intraclass correlation (ICC) was used to calculate internal consistency, and Cronbach's alpha was used to calculate test–retest reliability. The convergent validity of ABQOL and TABQOL was calculated using Pearson's correlation.

**Table 3: Mean Autoimmune Bullous Disease Quality of Life Questionnaire and Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire scores according to gender, clinical condition, and disease type**

| Variables | ABQOL | TABQOL |
|---|---|---|
| Sex | | |
| Female | 19.20±9.31 | 20.63±8.20 |
| Male | 14.82±7.57 | 15±9.81 |
| Clinical condition | | |
| Complete remission during tapering | 16.76±8.32 | 20.36±7.17 |
| Complete remission on minimal therapy | 14.5±7.98 | 15.91±9.14 |
| Complete remission off therapy | 14.36±7.65 | 14.90±7.17 |
| Partial remission during tapering | 20.5±6.36 | 21±2.82 |
| Partial remission on minimal therapy | 14.33±9.01 | 18.66±6.65 |
| Partial remission off therapy | 34±14.14 | 22.5±2.12 |
| Relapse/flare | 20.68±8.67 | 21.2±11.36 |
| Autoimmune blistering disease types | | |
| Pemphigus vulgaris | 17.16±8.97 | 18.25±8.78 |
| Pemphigus foliaceus | 12.66±3.05 | 17.5±7.7 |
| Bullous pemphigoid | 19.14±10.41 | 19.5±12.62 |
| EBA | 21.33±2.08 | 24±2.64 |
| Dermatitis Herpetiformis | 21.8±11.32 | 21.33±14.29 |

EBA: Epidermolysis bullosa acquisita, ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire

## Results

A total of 68 patients with AIBDs were recruited between February 2017 and February 2018. A subset of 20 (29.4%) patients completed the day 7 questionnaire. Of the 68 patients recruited, 24 were men and 44 were women. Patients' ages ranged from 23 to 83 years, with a mean age of 51.15 ± 13.48 years. Other patient characteristics are shown in Table 1.

Most of the patients had PV ($n$ = 49, 72%), followed by BP ($n$ = 8, 11.7%), DH ($n$ = 5, 7.3%), PF ($n$ = 3, 4.4%), and EBA ($n$ = 3, 4.4%). The mean disease duration of all patients was 45.44 ± 70.04 months. Most of the patients were in complete or partial remission (PDAI and BPDAI <5) and even patients with relapses were mild as they had minor relapses. The mean ABQOL score and TABQOL score for all patients were 17.70 ± 8.94 and 18.78 ± 9.08, respectively. Other AIBD characteristics of patients are shown in Table 2. The mean ABQOL and TABQOL scores according to gender, clinical

**Table 4: Mean values of quality of life questionnaires and patients' characteristics according to different blistering disease types**

| | A: Suprabasal blistering diseases (PV, PF) | B: Subepidermal blistering diseases (BP, EBA) | C: Others (DH) | *P*, A-B-C |
|---|---|---|---|---|
| Age | 50.1 | 55.2 | 52.2 | 0.796 |
| Sex | 0.3 | 0.4 | 0.6 | 0.322 |
| Income level | 2.2 | 2.1 | 2.6 | 0.379 |
| Educational level | 2.4 | 2.5 | 1.8 | 0.648 |
| Marital status | 2.1 | 2.1 | 1.6 | 0.086 |
| Concomitant diseases | 0.2 | 0.4 | 0.6 | 0.069 |
| DLQI | 0.2 | 0.9 | 0.7 | 0.062 |
| PHS | 3.5 | 3.0 | 3.4 | 0.465 |
| GHQ-12 | 4.5 | 4.2 | 5.2 | 0.966 |
| SF-36 physical functioning | 58.4 | 58.6 | 37.5 | 0.508 |
| SF-36 role-physical | 49 | 45.4 | 43.7 | 0.931 |
| SF-36 bodily pain | 71.2 | 69.3 | 65 | 0.973 |
| SF-36 general health | 51.9 | 47.7 | 43.7 | 0.671 |
| SF-36 vitality | 54.4 | 50.4 | 60 | 0.533 |
| SF-36 social functioning | 56.6 | 65.4 | 53.1 | 0.563 |
| SF-36 role-emotional | 52 | 48.4 | 41.6 | 0.730 |
| SF-36 mental health | 53.6 | 60.3 | 62 | 0.240 |
| ABQOL | 16.9 | 19.8 | 21.8 | 0.456 |
| TABQOL | 18.2 | 21 | 21.3 | 0.591 |

ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire, DLQI: Dermatology Life Quality Index, SF-36: Medical Outcome Study 36-item short-form questionnaire, GHQ-12: General Health Questionnaire, PHS: Perceived Health Status, PV: Pemphigus vulgaris, PF: Pemphigus foliaceus, BP: Bullous Pemphigoid, EBA: Epidermolysis bullosa acquisita, DH: Dermatitis herpetiformis

**Table 5: Correlation between Autoimmune Bullous Disease Quality of Life Questionnaire and Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire L and clinical parameters of patients**

| Variables | ABQOL | | TABQOL | |
|---|---|---|---|---|
| | *P* | *r* | *P* | *r* |
| Age | 0.099 | −0.203 | 0.692 | −0.052 |
| Sex[&] | 0.057 | −0.235 | 0.022 | −0.029 |
| Total course of disease | 0.555 | 0.073 | 0.953 | −0.008 |
| Clinical stage | 0.110 | 0.197 | 0.037 | 0.268 |
| Duration of last clinical condition[¥] | 0.032 | −0.263 | 0.019 | −0.299 |
| Marital Status | 0.764 | −0.037 | 0.440 | 0.101 |
| Education level | 0.923 | 0.012 | 0.686 | 0.052 |
| Concomitant diseases | 0.484 | −0.087 | 0.803 | −0.033 |
| Income level | 0.069 | 0.224 | 0.470 | −0.094 |
| PDAI | 0.143 | 0.204 | 0.0004 | 0.482 |
| ABSIS | 0.052 | 0.238 | 0.002 | 0.387 |
| BPDAI* | 0.823 | −0.115 | 0.925 | 0.059 |
| BPDAI-p* | 0.965 | 0.023 | 0.844 | 0.123 |
| VAS-Pruritus* | 0.104 | 0.799 | 0.204 | 0.949 |
| EBADAI* | 0.118 | 0.983 | 0.273 | −0.909 |

*There were limited number of patients in these groups. Thus, analysis of them is not very valid, [&]Female patients had higher ABQOL and TABQOL scores, [¥]Recent changes in clinical condition of patients has significant effect to TABQOL scores. Short duration is correlated with higher scores. Pearson's correlation was used to get the *P* value and correlation value. ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire, PDAI: Pemphigus Disease Area Index., ABSIS: Autoimmune Bullous Skin Disorder Intensity Score, BPDAI: Bullous Pemphigoid Disease Area Index, BPDAI-p: Bullous Pemphigoid Disease Area Index-pruritus score, EBADAI: Epidermolysis Bullosa Acquisita Disease Area Index, VAS-pruritus: Visual analog scale-pruritus

condition (outcome), and disease type are shown in detail in Table 3.

Both the Turkish versions of the ABQOL and TABQOL questionnaire have a high internal consistency (Cronbach's alpha coefficient 0.88 for TABQOL and 0.86 for ABQOL) and test–retest reliability (the ICC coefficient 0.872 for ABQOL and 0.879 for TABQOL). The correlation between ABQOL and TABQOL (total scores) is Pearson's $R = 0.609$.

When we examined the mean values of quality of life questionnaires and patients' characteristics according to different blistering disease types, there was no significant difference among the parameters shown in Table 4.

In terms of a correlation between ABQOL and TABQOL and clinical parameters of the patients, it was shown that ABQOL and TABQOL scores were reversely correlated with the duration of that clinical stage. On the other hand, TABQOL scores were directly correlated with PDAI and ABSIS. However, it was also shown that increased TABQOL scores were found in women and patients with partial remission and relapse [Table 5].

When we evaluated the mean values of quality of life questionnaires and patients' characteristics according to different stages of disease, only DLQI was shown to be significantly different among groups (0.017) [Table 6]. On the other hand, evaluation of the mean values of quality of life questionnaires and patients' characteristics according to different stages of therapy showed that DLQI and PHS were significantly changed among groups (both $P = 0.02$) [Table 7].

## Discussion

In this study, we validated the Turkish version of the disease-specific HQoL instruments, namely ABQOL and TABQOL, and assessed them in the Turkish population. Our results showed high internal consistencies of ABQOL and TABQOL with a Cronbach's alpha of 0.86 and 0.88, respectively. Cronbach's alpha of above 0.70 is ideal to examine the reliability of patient-reported measures for internal consistency of a questionnaire.[24] Our results were not only above the ideal 0.70 but also similar to previous research results, showing high internal consistencies.[25-28] In terms of test–retest reliability, the intraclass correlation coefficient was 0.872 for ABQOL and 0.879 for TABQOL. The correlation between ABQOL and TABQOL (total scores) was Pearson's $R = 0.609$. Thus, the Turkish versions of ABQOL and TABQOL questionnaires have been shown to be valid and reliable.

The highest ABQOL and TABQOL scores belonged to patients with EBA and DH. This was followed by patients with BP and then patients with PV. The lowest ABQOL and TABQOL scores belonged to patients with PF [Table 3]. These results could be related to severe itch symptoms, especially seen with EBA and DH, and a chronic course of these two diseases without good therapeutic options as recently PV, PF, and BP can be under control more effectively.

In terms of clinical condition and ABQOL-TABQOL scores, it was shown that patients with partial remission off therapy had the highest ABQOL and TABQOL scores [Table 3]. This was followed by patients with relapse and then patients with partial remission during tapering. Although patients with relapses were expected to have the highest scores, our result could be due to the anxiety and fear in patients who experience new lesions when they are off therapy, described as partial remission off therapy. As expected, patients with complete remission had lower ABQOL and TABQOL scores [Table 3].

There was no significant difference among the mean values of the quality of life questionnaires and the patients' characteristics. This result suggests the idea that the existence of AIBD is the main burden on one's quality of life, and this does not significantly change due to social and environmental factors, such as income level or educational level. However, TABQOL and ABQOL scores were found to be higher in women than in men [Table 5].

In terms of any correlation between ABQOL and TABQOL and the clinical parameters of patients, it was shown that ABQOL and TABQOL scores were reversely correlated with the duration of the last clinical stage. This could be due to psychological disturbance of patients regarding disease activity

**Table 6: Mean values of quality of life questionnaires according to different stages of disease**

| | Patients within tapering of therapy | Patient without any therapy or with minimal therapy | Patient with relapses | *P* |
|---|---|---|---|---|
| Age | 48.47 | 52.76 | 52 | 0.33 |
| Sex | 0.43 | 0.33 | 0.26 | 0.54 |
| Income level | 2.34 | 2.20 | 2.33 | 0.73 |
| Educational level | 2.60 | 2.13 | 2.80 | 0.37 |
| Marital status | 1.91 | 2.33 | 2.06 | 0.07 |
| Concomitant diseases | 0.26 | 0.33 | 0.20 | 0.62 |
| DLQI | 0.81 | 0.20 | 0.24 | 0.02 |
| PHS | 3.08 | 3.80 | 3.26 | 0.02 |
| GHQ-12, mean | 6.30 | 3.66 | 3.73 | 0.20 |
| SF-36 physical functioning | 57.60 | 55.17 | 60.71 | 0.76 |
| SF-36 role-physical | 50 | 57.75 | 25 | 0.08 |
| SF-36 bodily pain | 58.18 | 78.18 | 73.92 | 0.06 |
| SF-36 general health | 45.83 | 53.16 | 53.27 | 0.10 |
| SF-36 vitality | 54.77 | 52.24 | 56.78 | 0.55 |
| SF-36 social functioning | 57.27 | 56.98 | 60.89 | 0.90 |
| SF-36 role-emotional | 43.93 | 56.32 | 50 | 0.33 |
| SF-36 mental health | 57.81 | 54.06 | 54 | 0.55 |
| ABQOL | 20.68 | 15.73 | 17.26 | 0.18 |
| TABQOL | 21.20 | 16.28 | 20.46 | 0.22 |

ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire, DLQI: Dermatology Life Quality Index, SF-36: Medical Outcome Study 36-item short-form questionnaire, GHQ-12: General Health Questionnaire, PHS: Perceived Health Status

**Table 7: Mean values of quality of life questionnaires according to different stages of therapy**

| Variables | Group 1: Complete remission (off therapy/minimal therapy or during tapering) | Group 2: Partial remission (off therapy/minimal therapy or during tapering) | Group 3: Patient with relapses | *P*, Group 1-2-3 |
|---|---|---|---|---|
| Age | 52.39 | 53.14 | 48.47 | 0.32 |
| Sex | 0.34 | 0.14 | 0.43 | 0.36 |
| Income level | 2.26 | 2.14 | 2.34 | 0.67 |
| Educational level | 2.42 | 2 | 2.60 | 0.64 |
| Marital status | 2.26 | 2.14 | 1.91 | 0.09 |
| Concomitant diseases | 0.31 | 0.14 | 0.26 | 0.63 |
| DLQI | 0.17 | 0.46 | 0.81 | 0.017 |
| PHS | 3.65 | 3.42 | 3.08 | 0.09 |
| GHQ-12 | 3.55 | 4.42 | 6.30 | 0.18 |
| SF-36 physical functioning | 57.22 | 55.71 | 57.60 | 0.86 |
| SF-36 role-physical | 48.61 | 39.28 | 50 | 0.79 |
| SF-36 bodily pain | 77.15 | 75 | 58.18 | 0.08 |
| SF-36 general health | 53.93 | 49.40 | 45.83 | 0.07 |
| SF-36 vitality | 53.33 | 55.71 | 54.77 | 0.92 |
| SF-36 social functioning | 58.26 | 58.21 | 57.27 | 0.98 |
| SF-36 role-emotional | 54.62 | 52.38 | 43.93 | 0.36 |
| SF-36 mental health | 54.33 | 52.57 | 57.81 | 0.56 |
| ABQOL | 15.23 | 21.71 | 20.68 | 0.57 |
| TABQOL | 17.02 | 20.42 | 21.20 | 0.37 |

ABQOL: Autoimmune Bullous Disease Quality of Life Questionnaire, TABQOL: Treatment of Autoimmune Bullous Disease Quality of Life Questionnaire, DLQI: Dermatology Life Quality Index, SF-36: Medical Outcome Study 36-item short-form questionnaire, GHQ-12: General Health Questionnaire, PHS: Perceived Health Status

changes causing decrease in patients' quality of life in the early stages of the change [Table 5].

The cutoff values described by Boulard *et al*. suggested for PDAI are 15 and 45 and 17 and 53 for ABSIS, distinguishing moderate, significant, and extensive pemphigus forms.[29] The mean PDAI in our patient group was 3.26 ± 9.40 and the mean ABSIS was 4.88 ± 8.49, showing that our patient group was mainly consistent with moderate disease activity. Therefore, the mean values of disease severity scores were smaller than

the previous studies examining the same topic.[25-28] This could be the reason why we could not find a correlation between ABQOL and disease severity scores although TABQOL scores were directly correlated with PDAI and ABSIS [Table 5]. In the Greek study, it was shown that ABQOL is significantly correlated with PDAI, ABSIS, and BPDAI. This could be due to high disease activity of their patient group (mean PDAI was 35.8 ± 32.3 and mean ABSIS was 19.4 ± 10.92).[27] Similar results were also found in a Polish study.[26]

Until recent years, dermatology-specific HQoL instruments were used for monitoring disease activity and evaluating the effectiveness of care in AIBDs. The SF-36 and DLQI have shown a significant decrease in quality of life of patients with AIBDs. Paradisi *et al*. found that patients with pemphigus had a significantly impaired overall quality of life compared with healthy subjects.[30] A high prevalence of psychiatric comorbidity was also observed in pemphigus patients.[31] The SF-36, DLQI, and GHQs have been used to monitor the HQoL and psychological status of patients with PV.[32-34] The patients in this study cohort had a range of AIBD across a range of disease stages. However, most of the patients had low disease activity scores as most of them were followed for a long time in our clinic. Only the DLQI was shown to be significantly different among groups ($P = 0.017$) when we evaluated the mean values of quality of life questionnaires and patients' characteristics according to different stages of disease [Table 6]. Moreover, evaluation of the mean values of quality of life questionnaires and patients' characteristics according to different stages of therapy showed that DLQI and PHS were significantly changed among groups (both $P = 0.02$) [Table 6]. The reason that we have not found significant differences in the ABQOL and TABQOL between different stages of disease and different stages of therapy could be due to a lack of significant difference between disease activity scores in these subgroups. Furthermore, the HQoL burden is often thought to be independent of objective disease burden and clinical severity.

ABQOL was shown to have advantages in AIBD patients over the generic HQoL instruments (DLQI, SF-36, and GHQ) and can be a promising patient-based measure for evaluating disease burden, monitoring disease activity, and examining the response to therapeutic intervention.[25]

The reason for finding a significant correlation between TABQOL and PDAI and ABSIS but not with ABQOL in our study could be due to the fact that HQoL depends on the effects of treatment (often long-term and with the risk of serious adverse events). AIBD treatments have an adverse impact on HQoL by causing a greater morbidity, complications arising from these treatments, and low compliance with medical recommendations. These correlations suggest that the impact of AIBD and AIBD treatment presents a similar level of impairment in QOL.[35]

### Limitations

The limitation of our study is the small numbers of patients with BP, PF, EBA, and DH and most of our patients had low disease activity scores making hard to evaluate the correlation of ABQOL and TABQOL scores with disease activity and different stages of diseases. This could be the case because the study was conducted by a single university center. However, the incidence of these disorders, especially for BP, is also low in the Turkish population compared with Western countries such as USA and European.

## Conclusions

The creation of a standardized disease-specific outcome measure, such as the ABQOL and TABQOL, is important to allow comparisons between different research studies.[36] Turkish ABQOL and TABQOL questionnaires can be used as clinical evaluation tools in daily routine and/or outcome measures for clinical trials to establish better analysis of treatments for AIBD in Turkey.

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### Conflicts of interest

There are no conflicts of interest.

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