

## Dermatology Life Quality Index in Various Skin Diseases Among Hospitalized Patients

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### Abstract

**Background:** Skin diseases may affect daily lives of individuals and their psychological and social relationships. Appropriate measurement systems are required to measure the impact of the disease on the quality of life. The Dermatology Life Quality Index (DLQI) is the most commonly used dermatology specific quality of life instrument.

**Material and Methods:** Two hundreds and ninety-one inpatients and 30 healthy individuals were enrolled in the study. The patient group consisted of following diagnostic subgroups: psoriasis (40), pemphigus vulgaris (20), Behçet's Disease (20), drug eruptions (29), vasculitis (20), skin infections (51), chronic urticaria (42), allergic contact dermatitis (47), and generalized vitiligo (22). All patients provided informed consent and participants were requested to fill the validated Turkish version of DLQI.

**Results:** Psoriasis patients received the highest scores. In order, psoriasis, Behçet's disease, pemphigus vulgaris, contact dermatitis, and vasculitis patients obtained the highest total scores ( $p < 0.05$ ). The difference between the control group and other diseases was also significant ( $p < 0.05$ ).

**Conclusion:** Only a single disease was investigated in most DLQI studies published in the literature. This study reports DLQI scores on the patients with drug eruptions, vasculitis, and skin infections first time to our knowledge and also the results are compared with other diseases. The DLQI, which can be applied easily, is considered to be a practical test, and is suitable to be employed in many of dermatological diseases.

### Introduction

Dermatologic diseases may affect not only daily lives of individuals, but also their psychological and social relationships and daily activities. Appropriate measurement systems are required to draw a convenient treatment plan and to measure the impact of

the disease on the quality of life of the patient [1, 2].

For this purpose, several test methods are developed and widely used in patients with skin diseases [3]. The Dermatology Life Quality Index (DLQI) is recognized as the most frequently used primary dermatological scale to

investigate life quality of patients [1, 2]. This test has been widely used worldwide for 16 years by many medical centers to explore the impact of dermatological diseases on quality of life. It is a short, easily understandable, and simple scale. Due to these features it has been widely used both in clinical practice and research studies [1, 4].

In this study, we applied DLQI to inpatients at a hospital and compared the results from these diseases to the results of the most frequently examined cases. Most DLQI studies we identified in the literature interestingly investigated only a single disease. We found only a few DLQI studies comparing certain dermatological disease groups. The present study compares dermatological disease groups based on DLQI scores.

## Materials and Methods

The patients who were referred to our clinic and hospitalized for treatment and healthy individuals without any complaints of a skin disease were enrolled in our study. All participants filled the Turkish version of DLQI, which was developed by *Finley* et al., [5] and its Turkish version was validated and tested for reliability by *Öztürkcan* et al. [6] (Table 1). There were 4 possible response choices in the questionnaire (very much-very-slightly-none) and each response was assessed from 0 to 3, a total number of 10 questions were asked and the scores ranged between 0-30. Patients at age 18 and over were included in the study.

While we were assessing the scores, some questions such as questions 1 and 2 (symptoms and the feelings of the patient), questions 3 and 4 (daily activities), questions 5 and 6 (assessment of leisure time) and questions 8 and 9 (personal relations-

hips) were assessed together, as they were related to one another. Question 7 was related to school/business life and question 10 was related to the impact of the therapy. The total score is given in the final column.

## Statistical Analysis

Statistical analyses were performed with SPSS software (Statistical Package for the Social Sciences, version 13.0, SSPS Inc, Chicago, IL, USA). All numerical variables with normal distribution were expressed as the mean  $\pm$  standard deviation (SD). Categorical variables were given as percentages and were compared with chi-square test. The mean of groups in terms of constant variables was compared with one way variant analysis (ANOVA). Subsequent variant analysis, Duncan multiple comparison test were used for determination of different groups. A p value <0.05 was considered as statistically significant.

## Results

A total of 291 patients and 30 healthy individuals (control group) were enrolled in the study. One hundred and fifty-three patients were females (53%) and 137 were males (47%). In the control group, 11 of patients were females (36%) and 19 were males (64%). There was no significant difference between females and males in patient and control groups ( $p > 0.05$ ).

The number of patients, mean age and sex of patients and those of control group are presented on Table 1. The general mean age of our patients was  $38.23 \pm 17.09$  years. The mean age of individuals in the control group was  $32.63 \pm 10.58$  years, and the difference was found statistically not significant ( $p > 0.05$ ). All scores and total scores of the entire

**Table 1.** The Number, Mean Age, and Gender of the Patient Groups and the Control Group

	Number (n)	Age $\pm$ SD	Females (n)	(%)	Males (n)	(%)
Psoriasis	40	33.75 $\pm$ 14.58	28	(70)	12	(30)
Pemphigus vulgaris	20	45.10 $\pm$ 11.77	11	(55)	9	(45)
Behçet's disease	20	25.45 $\pm$ 8.89	12	(60)	8	(40)
Drug eruptions	29	39.75 $\pm$ 14.48	12	(41.4)	17	58.6
Vasculitis	20	35.60 $\pm$ 17.43	12	(60)	8	(40)
Infections	51	38.03 $\pm$ 16.23	19	(37.3)	32	(62.7)
Chronic urticaria	42	34.30 $\pm$ 13.15	30	(71.4)	12	(28.6)
Contact dermatitis	47	45.29 $\pm$ 18.61	16	(34)	31	(66)
Vitiligo	22	29.72 $\pm$ 7.4	14	(63.6)	8	(36.4)
Control group	30	32.63 $\pm$ 10.58	11	(36.7)	19	(63.3)

**Table 2.** All Scores and Total Scores of the Patient Groups and Control Group

	Question 1-2	Question 3-4	Question 5-6	Question 7	Question 8-9	Question 10	Total Score
Psoriasis	4.22	3.72	3.10	1.23	1.22	1.05	14.55
Pemphigus vulgaris	4.10	3.10	2.55	1.05	1.40	0.40	12.65
Behçet's disease	4.30	2.75	2.95	1.35	1.75	0.40	13.5
Drug eruptions	3.06	1.72	1.86	1.28	0.65	0.38	8.96
Vasculitis	3.30	1.80	2.40	1.15	0.60	0.45	9.70
Infections	3.33	1.78	1.82	0.86	0.50	0.14	8.42
Chronic urticaria	3.92	1.28	1.88	1.05	0.54	0.05	8.73
Contact dermatitis	3.95	2.31	2.23	1.09	0.78	0.51	10.87
Vitiligo	1.18	2.36	0.90	0.00	0.00	0.00	4.63
Control group	0.70	0.30	0.16	0.07	0.00	0.03	1.26

groups of patients included in the study are presented on **Table 2**.

There was no significant difference between the control group and vitiligo group in questions 1 and 2 ( $p = 0.502$ ). The highest scores were determined for patients with Behçet's disease, psoriasis, and pemphigus ( $p < 0.05$ ) for questions 1 and 2. The differences between other disease groups and the control group were statistically significant ( $p < 0.05$ ).

The highest scores for questions 3 and 4 were measured in patients with psoriasis, pemphigus, and Behçet's disease ( $p < 0.05$ ). These scores were significantly higher than the individuals in the control group and the patients in contact dermatitis and vitiligo groups ( $p < 0.05$ ). When compared to the control group, the scores of contact dermatitis and vitiligo patients were also significantly higher. However, no significant differences were found regarding urticaria, drug eruption, infection, and vasculitis groups when compared to the control group ( $p > 0.50$ ).

The highest scores for questions 5 and 6 were measured for patients with psoriasis, Behçet's disease, and pemphigus. These scores were statistically higher than those of the individuals in the control group and the patients with contact dermatitis and vitiligo and those of other patient groups ( $p < 0.05$ ). The scores of contact dermatitis and vasculitis groups were significantly higher than those of vitiligo, infection, drug eruption, and urticaria groups and also scores of control group. No significant difference was detected between the scores of control group and those of viti-

ligo, infection, drug eruption, and urticaria groups ( $p > 0.502$ ).

The highest scores for question 7 was determined for patients with Behçet's disease, drug eruption, psoriasis, vasculitis, and contact dermatitis ( $p < 0.05$ ). The scores obtained from the patients with these diseases were significantly higher than those obtained from the control group and other disease groups. No statistically significant differences were detected between the control group and vitiligo, infection, urticaria, and pemphigus groups ( $p > 0.50$ ).

Regarding questions 8 and 9 no difference was found between the control and vitiligo groups ( $p > 0.05$ ). The highest scores were measured for Behçet's disease and pemphigus groups. The differences between them and the control group and between them and other disease groups were statistically significant ( $p < 0.05$ ). However, no significant differences were found between the control group and other disease groups.

In question 10, a significant difference occurred between psoriasis group and the control group. However, there were no significant differences between other disease groups and the control group.

The highest total scores were calculated for psoriasis, Behçet's disease, pemphigus, contact dermatitis, and vasculitis groups, respectively. The differences between these groups and the control group were statistically significant ( $p < 0.05$ ). The differences between other disease groups and the control group were also significant, except the difference between

control group and vitiligo, which was not significant.

## Discussion

In this study, we found significant deterioration in the quality of lives of patients, who were hospitalized and treated for various skin diseases.

The effect of skin diseases on quality of life is higher than the impact of many systemic disorders. As skin lesions are generally visible, the interaction with other individuals becomes very difficult. Hence the patients are prone to be isolated from social lives. Additionally, symptoms such as itching and pain can also negatively impact the life quality of patients [4]. DLQI was the first life quality scale specific to dermatological diseases. The test was developed by *Finlay* et al. in 1994 and its original language was English [5]. Since then, DLQI was used in 33 different skin diseases in 32 countries and was translated into 55 languages. DLQI is commonly used in psoriasis, atopic dermatitis, vitiligo, acne, contact dermatitis, and hyperhidrosis [1]. The DLQI was translated into Turkish and validated by *Öztürkcan* et al [6].

It consists of 10 questions concerning patients' perception of the impact of skin diseases on different aspects of their quality of life (QoL) over the last week. The items of the DLQI encompass aspects such as symptoms and feelings of participants, daily activities, leisure time assessment, work or school life, personal relationships, and the side-effects of treatment. DLQI has been validated for dermatology patients aged 16 years and above [1, 5].

The highest total DLQI score among the patients we enrolled in our study was obtained for psoriasis, Behçet's disease, pemphigus vulgaris, contact dermatitis, and vasculitis.

In this study, we also applied DLQI on diseases, which have so far not reported in the literature. Those were drug eruptions, vasculitis, and skin infection patients. The scores of those patients were compared to those of patients with other diseases.

Itching and other physical symptoms in psoriasis may severely affect the quality of life of patients. Patients may face restrictions in

their social and business activities and entertainment options. Besides, treatment expenses can cause economic losses. Furthermore, some treatment regimes are likely to cause frequent doctor visits or hospitalization, while some regimes may take a long time due to various side effects, which can be boring for patients and negatively affect their daily lives [7, 8]. The impact of psoriasis on the quality of life of patients may resemble the impact of life-threatening chronic disorders. Therefore, it may be necessary to determine the dermatological intensity of the disorder and measure the impact on social extent and quality of life of individuals [8].

There are many studies performed about quality of life and psoriasis. In these studies different quality of life scales were compared. It was suggested that DLQI is a short and compact test and due to its simplicity, it was one of the most commonly applied tests in such comparison studies [8, 9]. The total DLQI score in our patients with psoriasis was found 14.55. The highest scores were obtained from questions 1-6. These questions are related to symptoms, feelings, daily activities, and assessment of leisure time. In our study, patients were suffering from severe psoriasis requiring treatment by means of hospitalization (total body surface area >10). Therefore we assumed that the severity was one reason that DLQI scores were higher in our patients.

In this study, the second disease, which demonstrated the highest DLQI scores, was Behçet's disease. It is a chronic condition and may negatively affect the physical and mental health of individuals. There are a limited number of studies investigating the impact of this condition on the quality of life. One study suggested that appropriate treatments may improve symptoms, such as fatigue, arthralgia, and mucocutaneous lesions, and the quality of life of individuals. In parallel to this, DLQI scores shall also improve [10]. *Finlay* et al. applied DLQI scale to 325 patients with Behçet's disease and the mean score was found 5.7 [11]. All of our Behçet patients were at their active phase. All complained of oral aphtous pain, while 80% suffered from genital ulcers, 40% from uveitis, 50% from erythema nodosum, and 45% from arthritis. The mean total score was 13.5. We assumed that the reasons of high DLQI scores in our patients were being in active phase

and suffering from severe symptoms requiring hospitalization. The sub-categories demonstrated highest scores for questions 1, 2, 5, and 6.

Pemphigus was the 3rd disease with the highest DLQI scores in our study. Pemphigus vulgaris is a life-threatening disease requiring long-term treatment with immunosuppressive agents. This group of drugs may lead to serious side effects. Pemphigus is also considered as one of the most severe and progressive skin diseases. We identified only one study in the literature investigating the quality of life of pemphigus patients. The study was carried out on 30 patients by the German Bullous Skin Disease Study Group and mean DLQI score was 10. This score was extremely high when compared to the results obtained from other skin diseases and therefore, DLQI was considered as a very effective tool in clinical studies and in the treatment of such patients [12]. In our study, the mean total score was 12.85 in patients with pemphigus. The highest scores were obtained for symptoms and feelings. These results demonstrated that pemphigus has affected the quality of life more negatively when compared to the negative effect of other skin diseases.

Contact dermatitis is a very frequently occurring condition and may deteriorate the quality of life and socio-economic level of an individual [13]. There are some studies of irritant contact dermatitis in the literature, where a quality of life index was applied. We found only a few studies on acute contact dermatitis (ACD), where DLQI was applied. In one study the mean DLQI score in patients with contact dermatitis was found 8.0 (4.0-13.0) [14]. In our study, the mean total score in patients with ACD was 10.7 and the highest scores were obtained from questions related to symptoms, feelings, and daily activities. Patients with high scores complained of severe itching. The lesions were widespread in this group of individuals and we assumed that itching in general originated from autosensitivity findings accompanying ACD.

Leucocytoclastic vasculitis is a condition affecting small vessels and generally progressive with cutaneous findings. To our knowledge there was no study in the literature investigating the relationship between quality of life and leucocytoclastic vasculitis

or primary cutaneous vasculitis. Vasculitis patients may need to be hospitalized for follow up or to rest as much as they can, so the impact on other systems can be determined. The quality of life of primary systemic vasculitis patients was investigated with various tests. The results indicated a significant deterioration in the quality of life of such patients [15]. The mean score in our study was 9.70. The highest scores were related to symptoms and feelings. The scores may be low in some disease groups in our study such as psoriasis and pemphigus, but they were extremely high in comparison to other frequently seen skin diseases. High DLQI scores in our patients may be due to the severity of their conditions, which needed hospitalization. We could not find a study in the literature for comparison. The studies exploring this area should be conducted.

Skin infections are seen frequently and generally last short-term by nature. They usually respond well to the treatment. In the present study, we included frequently seen infections including cellulites, erysipelas, and lymphangitis for a detailed assessment. Twenty eight patients were diagnosed with cellulites, 17 with erysipelas and 14 with lymphangitis. The lesions were located at the extremities and the duration of symptoms varied between 3 to 10 days. The total score was 8.42. A statistically significant difference was observed only in symptoms and feelings between skin infections and control groups. We did not find any study in the literature regarding bacterial infections and DLQI scores. There were some studies about DLQI application in tinea pedis patients. In one study mean DLQI score was found 7.4 in patients with superficial fungal infection [3]. This result is almost identical to the result we found in our study.

The drug eruptions can be divided into several groups. Some only cause skin rashes, while others may be life-threatening. The literature has some publications reporting improvement in the quality of life of individuals after medication use [16, 17]. However, there was no study performed investigating the impact of the side effects and drug eruptions on the quality of life. Drugs lead to miscellaneous dermatological rashes. The side effects may rarely lead to anaphylaxis and become life-threatening. In our study, macular-papular drug eruptions were present in 14 of total 29

patients, while 3 patients suffered from generalized fixed, 5 from urticarial, 2 from bullous, and 5 from lichenoid drug eruptions. All groups were assessed together. The mean total score was 8.96, and symptoms and feelings were significantly impacted. Additionally, we noticed that the impact on school and business lives of individuals was also high. The eruptions caused by drugs can deteriorate the appearance of the individual. Patients may experience anxiety even panic attacks, which may persist. Therefore we assume that high total DLQI scores in these hospitalized patients demonstrate impact of these reactions on quality of life.

Urticaria is a recurrent, short-term disease, with erythema and transient dermal edema and dermal blistering due to vasodilatation [18]. Many studies investigated the quality of life of chronic urticaria patients by DLQI and many other tests. DLQI studies revealed deterioration in questions related to symptoms, feelings, and school and business life of chronic urticaria patients. The leisure times and daily activities were impacted to a lesser degree [19, 20].

In our study chronic urticaria negatively affected the quality of life and especially caused deterioration in sleeping habits and mental health. Females were found to be more affected compared to males. In our study the mean total score was 8.73. Compatible to the scores in the literature we found that the highest scores were for symptoms and feelings. Chronic urticaria is a chronic condition with severe and instant itching and may become frustrating for both patients and caregivers. It may also lead to sleep disturbances, social isolation, emotional and sexual disorders, and reduce the quality of life of patients [21]. There are many studies where DLQI scores were worse than the scores obtained from psoriasis, acne, Behçet's disease, and vitiligo [22]. Merely, patients in our study who were diagnosed with urticaria enjoyed a better level of quality of life compared to patients suffering from psoriasis, pemphigus, Behçet's disease, contact dermatitis, and vasculitis, while their DLQI scores were significantly higher than vitiligo and control group patients.

Vitiligo is a chronic disorder and may cause loss of pigmentation. Even it is not life-threatening, it has an enormous negative impact

on the quality of life and psychological state of patients. Vitiligo may reduce the level of self confidence, lead to poor body image, and impact individual relationships negatively. In one of the several vitiligo and quality of life studies, DLQI score was 7.0 for patients with vitiligo and 8.6 for patients with psoriasis. It is suggested that lesions located at the visible sites of the body and genital organs may considerably deteriorate the quality of life of vitiligo patients [23]. In our study, vitiligo group had the lowest DLQI scores. Excluding question 3 (related to external appearance), no significant difference was detected in any question between vitiligo and control groups. In a study in the literature, the mean score for vitiligo was found 4.95, which somehow was lower than the scores of psoriasis patients [6, 24]. In our study the mean score was 4.65 which is comparable to the mentioned study [24]. The highest scores in our study were found for questions 2, 4, 5, and 3.

Even though many large-scaled studies were published regarding quality of life in certain skin diseases in the literature, we noticed some skin diseases were never studied at all. Yet it is essential to investigate quality of life in all skin diseases by the means of large-scaled series of studies. Besides skin diseases, such as psoriasis which was thoroughly investigated in the past, we included patient groups that suffer from vasculitis, cutaneous infections, and drug eruptions, as they were not investigated adequately so far. The DLQI scores were significantly higher in certain disease groups, such as psoriasis, pemphigus, and Behçet's disease (except vitiligo) compared to the scores of control group.

In a study carried out by *Finlay* on 200 cases [5], sub-groups of diseases were investigated in a non-separated fashion. The questions which received the highest scores were respectively questions 1, 2, and 4. These results are similar to the results we obtained in our study.

In conclusion skin diseases significantly affect the quality of life of individuals. This impact is worse in patients suffering from chronic, recurrent, and treatment resistant diseases. Acute diseases with early onset and visible lesions and symptoms such as severe itching may restrict the quality of life of patients and these individuals are prone to iso-

late themselves from the society. Our findings also suggest that the DLQI is an easily applied, practical test, patients are able to understand the questions, and it can be used in many dermatological diseases.

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