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# Evaluation of the Effect of Phototherapy Treatment on Dermatology Quality of Life Index

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## ABSTRACT

**Background:** Dermatology Quality of Life Index (DLQI) was first introduced for routine use in 1994 by Finlay and Khan in order to evaluate the quality of life index of various skin diseases. The aim of this study is to evaluate the effect of phototherapy treatment [narrowband ultraviolet-B (NB-UVB)] on the DLQI of patients who are followed in our clinic and receive phototherapy treatment for various dermatological reasons.

**Materials and Methods:** A total of 40 patients were included in the study. Patients were asked to fill out DLQI questionnaires before phototherapy treatment (NB-UVB) and at the 6th month of treatment. Statistical analysis was done with SPSS-21.

**Results:** The mean age of the patients was 37.9±10.07 years (18-63 years). Patients receiving phototherapy were evaluated in 4 groups. The first group was vitiligo (n=14, 35.0%), the second group was psoriasis vulgaris (n=10, 25%), the third group was mycosis fungoides (MF) (n=7, 17.5%) and the fourth group was lichen planus (n=9, 22.5%). was. In the 6th month of treatment, the DLQI score before and after phototherapy in vitiligo patients decreased from 14.79±8.239 to 5.86±6.075, in psoriasis vulgaris patients from 9.00±7.165 to 2.20±3.795, and in MF patients from 9.00±7.188 to 2.29±3.147, and it was found to be significantly lower in lichen planus patients, from 9.55±6.023 to 3.33±3.873.

**Conclusion:** In the cross-sectional study we conducted with DLQI, a current scale, in our patients receiving phototherapy treatment at our center, significant improvement was observed after treatment, proving that phototherapy has a significant benefit on quality of life.

**Keywords:** Dermatology Quality of Life Index, DLQI, Phototherapy

## Introduction

Dermatology Quality of Life Index (DLQI) in dermatology is of great importance for many reasons. Measuring dermatological patients' pre-treatment or treatment-related quality of life indexes gives us information about the effectiveness of the treatment, the course of the disease, and the clinical course [1,2,3]. The most important feature of quality of life measurements is that they are only an indicator of the quality of life at the point in time when the measurement is made [4,5]. DLQI is an evaluation in the form of a survey consisting of simple, understandable and short questions that are not specific to any dermatological disease. DLQI consists of a total of 10 questions. Questions 1 and 2 are based on mood, 3 and 4 are based on day-long activities, 5 and 6 are based on leisure activities, 7 are occupational, 8 and 9 are social activities and 10 are treatment (Annex-1). Oztürkcan et al. [6] tested the functionality of DLQI in Turkish and ensured its safety. Phototherapy is used in the treatment of various dermatological diseases for therapeutic purposes using natural sunlight or artificial light sources [7,8].

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## Materials and Methods

The study included 40 patients who received NB-UVB treatment for various dermatological diseases at Istanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine, Department of Dermatology and Venereology, and the patients who received phototherapy treatment were divided into 4 groups (first group: vitiligo, second group: psoriasis vulgaris, third group: mycosis fungoides (MF), fourth group: lichen planus). Patients were asked to fill out DLQI questionnaires, each consisting of 10 questions, before treatment and at the sixth month of treatment. We used the Turkish version of these questionnaires [6]. These questionnaires consist of 20 items, each scored from 0 to 3 (very much, a lot, sometimes and never), with a final maximum score of 30. A score above 10 represents poor quality of life.

The approval of Istanbul Univeristy-Cerrahpasa, Cerrahpasa Faculty of Medicine Ethics Committee was taken before initiating the study (number: E-83045809-60401.01-712168, date: 13.06.2023).

### Statistical Analysis

The statistical analysis was performed with SPSS-21. The descriptive statistic method and frequency analysis were used for the data distribution. In continuous data, those with normal distribution were shown as median ± standard deviation, and those that did not fit into the normal distribution were shown as median (minimum-maximum). Categorical data were presented with frequency and percentage. For comparison of continuous data, Mann-Whitney U test was used for two groups, one-way ANOVA or Kruskal-Wallis test was used for comparison of three groups. Chi-square test and Fisher's test in categorical data exact test was used. All tests were bilateral and statistical significance was accepted as $p<0.05$.

## Results

Of the 40 patients included in the study, 17 (42.5%) were male and 23 (57.5%) were female. The ages of the patients ranged between 18 and 63, and the average age was 37.9±10.07. Information was obtained about the educational status of the patients participating in the study; 6 (15%) were primary school graduates, 20 (50.0%) were high school graduates, and 7 (17%) were university graduates, respectively. Patients receiving NB-UVB were evaluated in 4 groups. The first group was vitiligo (n=14, 35.0%), the second group was psoriasis vulgaris (n=10, 25%), the third group was MF (n=7, 17.5%) and the fourth group was lichen planus (n=9, 22.5%) it consisted of patients. Information was obtained from the patients about their previous treatments; 5 people (12.5%) had never received treatment before or could not remember whether they had received treatment. 31 people (77.5%) stated that they received topical treatments, one person (2.5%) stated that they received systemic corticosteroids, and 3 people (7.5%) stated that they received other immunosuppressive treatments. The mean score calculated for DLQI before phototherapy treatment (NB-UVB) was 11.15±7,564, and the mean score after phototherapy treatment (NB-UVB) was 3.75±4,781. The maximum score in dermatology quality of life measure is scored out of 30. On the scoring scale, 0-1= no impact on the patient's quality of life, 2-5= minimal impact, 6-10= moderate impact, 11-20= very major impact, 21-30= extremely major impact. A score above 10 it is considered a high score and indicates a poorer quality of life [9-10]. When the quality of life indexes of vitiligo, psoriasis vulgaris, MF and lichen planus patients were compared with the Wilcoxon signed ranks test before and after phototherapy treatment, the quality of life index score of vitiligo patients before phototherapy treatment (NB-UVB) ($\bar{X}$= 14.79, S= 8,239) was compared to the quality of life index score after phototherapy treatment (NB-UVB) respectively. It is seen that it is higher in statistical significance than ($\bar{X}$= 5.86, S= 6,075) ($p<0.001$). It is seen that the quality of life index score of psoriasis vulgaris patients before phototherapy treatment (NB-UVB) ($\bar{X}$= 9.00, S= 7,165) is statistically significantly higher than the quality of life index score after phototherapy treatment (NB-UVB) ($\bar{X}$= 2.20, S= 3,795) ($p<0.008$). It is seen that the quality of life index score of MF patients before phototherapy treatment (NB-UVB) ($\bar{X}$= 9.00, S= 7,188) is statistically significantly higher than the quality of life index score after phototherapy treatment (DB-UVB) ($\bar{X}$= 2.29, S= 3,147) ($p<0.017$). It is seen that the quality of life index score of lichen planus patients before phototherapy treatment (NB-UVB) ($\bar{X}$= 9.55, S= 6,023) is statistically significantly higher than the quality of life index score after phototherapy treatment (NB-UVB) ($\bar{X}$= 3.33, S= 3.873) ($p<0.008$).

## Discussion

DLQI was first introduced for routine use in 1994 by Finlay and Khan [1] in order to evaluate the quality of life index of various skin diseases. It is designed to evaluate the effects on the quality of life of symptoms and emotions, daily activities, leisure, school and work life, personal relationships, and treatment of various dermatological diseases [9,10,11]. Quality of life indexes of a total of 40 patients (vitiligo, psoriasis vulgaris, MF and lichen planus) who applied to the phototherapy unit in our center for treatment were calculated and evaluated for each group at the time of admission and in the sixth month of treatment.

Vitiligo is a dermatosis that results in the destruction of epideramal melanocytes and consists of depigmented patches. The global prevalence of vitiligo is between 0.1-8% [12]. Although Psoralen ultraviolet A (PUVA) constitutes the first-line treatment for vitiligo, various studies have shown that NB-UVB therapy is more effective, superior and safe compared to PUVA therapy. In our study, the

quality of life index score of a total of 14 vitiligo patients who responded to phototherapy treatment (NB-UVB) was 14.79±8.239 before treatment and 5.86±6.075 after treatment, and it was observed to decrease significantly after treatment ($p<0.01$). Similar results are observed in various studies in the literature. In the study conducted by Chahar et al. [13] in 2018 with 54 cases diagnosed with vitiligo, DLQI decreased from 8.64±4.32 to 5.86±2.15 after NB-UVB treatment. Similarly, in a study conducted by Mou et al. [14] in China they reported that DLQI before and after NB-UVB treatment were 6.3±4.8 and 3.1±2.4 respectively, and the difference was significant. In light of these studies, it has been shown that phototherapy treatment has a positive therapeutic result in vitiligo.

The relationship between psoriasis and quality of life was first prepared in 1987 by Finaly and Kell as the Psoriasis Dysfunction Index [15]. Afterwards, DLQI was designed as a simple and practical scale that can be applied routinely to measure the impact of psoriasis and different skin diseases on the quality of life [1]. There are many studies in the literature investigating the effects of treatment agents on disease severity and quality of life. In the study conducted by Couto et al. [16] with twenty male and female patients, a positive and moderate correlation was found between DLQI and Psoriasis Area Severity Index (PASI) of psoriasis patients before and after 32 phototherapy sessions ($r=0.48$, $p=0.03$). In the study conducted by Robaee et al. [17] with a total of 72 patients, it was found that DLQI improved significantly after phototherapy and was positively correlated with PASI. In our study, we found that the DLQI of psoriasis patients before and after phototherapy treatment were 9±7.165 and 2.2±3.795, respectively, and the difference was significant.

MF is a lymphoproliferative disease characterized by atypical lymphocytes accumulating in the skin. Phototherapy is one of the most commonly used therapeutic approaches in early-stage MF [18]. There are a few studies investigating the effect of treatment on quality of life in MF, but none of these studies address psychological health [19,20,21,22]. In a study conducted by Graier et al. [23] with 24 MF patients, they found that PUVA treatment significantly increased the overall quality of life by reducing DLQI scores by an average of 58.6%. With or without maintenance treatment, improvements in quality of life and psychological well-being continued [23]. In our study, the quality of life index score of a total of 7 MF patients who responded to phototherapy was 9±7.188 before treatment and 2.29±3.147 after treatment, and it was observed to decrease significantly after treatment ($p<0.017$).

Lichen planus is a dermatosis that affects the skin and mucosa and is accompanied by itching and ulcerations [24,25]. Although this disease can widely affect many aspects of life, such as sexual activity and body image perception, its effect on quality of life and psychopathological relationships have not been adequately investigated [25,26,27]. Flocco et al.'s [26,27,28] study of 100 cases diagnosed with lichen planus, quality of life was affected in 78% of the cases. Additionally, different mean scores were determined for different affected localizations [29,30]. The DLQI of patients with genital lichen planus (8.68±6.96) was significantly higher than that of patients whose genital area was not affected (5.01±5.49; $p=0.009$). In our study, the average DLQI score of lichen planus patients before receiving phototherapy was 9.55±6.023. After the treatment, a significant improvement was observed in the patients' quality of life indexes ($p<0.008$). In our study, it was determined that quality of life indexes, which were worse before phototherapy, improved significantly as a result of treatment or during treatment follow-up (Table 1).

### Study Limitation

The main limitation of our study is being a retrospective study that was conducted from a single center with a limited number of patients.

## Conclusion

As a result, in the cross-sectional study we conducted with DLQI, a current scale, in our patients receiving phototherapy treatment at our center, significant improvement was observed after treatment, proving that phototherapy has a significant benefit on quality of life.

**Table 1. Demographic characteristics of the patients and quality of life index scores**

| Category | Total |
|---|---|
| **Age** | |
| Mean ± SD | 37.9±10.07 |
| Median (min-max) | 37.5 (18-63) |
| **Gender n (%)** | 40 (100%) |
| Woman | 23 (57.5%) |
| Male | 17 (42.5%) |
| **Illness n (%)** | |
| Vitiligo | 14 (35%) |
| Psoriasis vulgaris | 10 (25%) |
| Mycosis fungoides | 7 (17.5%) |
| Lichen planus | 9 (22.5%) |
| **DLQI score (before phototherapy)** | |
| Mean ± SD | 11.15±7,564 |
| Median (min-max) | 11 (0-30) |
| **DLQI skoru (after phototherapy)** | |
| Mean ± SD | 3.75±4,781 |

SD: Standard deviation, DLQI: Dermatology Life Quality Index

### Ethics

**Ethics Committee Approval:** The approval of Istanbul Univeristy-Cerrahpasa, Cerrahpasa Faculty of Medicine Ethics Committee was taken before initiating the study (number: E-83045809-60401.01-712168, date: 13.06.2023).

**Informed Consent:** Retrospective study.

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

### Authorship Contributions

Concept: N.B., Design: Z.A.F., Data Collection or Processing: N.B., Analysis or Interpretation: N.B., Literature Search: Z.A.F., Writing: N.B., Z.A.F.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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## Questionnaire

The purpose of this questionnaire is to measure how much your skin disease affects your life in the last 7 days. Please tick only one option that you think is most appropriate for each question [6].

| | | | | |
|---|---|---|---|---|
| **During the last week, how itchy, painful or stinging was your skin condition** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **During the past week, how embarrassed have you been about the condition of your skin or have you found yourself uncomfortable with the appearance of your skin?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **During the last week, how much did your skin condition prevent you from going shopping or tending to your garden?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **During the past week, how much did your skin condition affect the clothes you wore??** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **Over the past week, how much has the condition of your skin affected your social or leisure activities?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **Over the past week, how difficult has your skin condition made it for you to do any sports?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **During the past week, has your skin condition prevented you from working or studying? yes no not suitable, if your answer is "no", how much of a problem has your skin condition caused you to work or work during the past week?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **How much of a problem has your skin condition caused your partner, friend, or relative during the past week?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **To what extent has your skin condition caused sexual distress during the past week?** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |
| **How much of a problem has the treatment for your skin been over the past week? (for example, by causing disorganization and clutter in your home or by taking up your time.)** | | | | |
| Very much | A lot | A little | Not at all | Not relevant |

Thank you for participating in the survey.