

Research

## Cross Validation of the Turkish Version of Children's Dermatology Life Quality Index

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**Key Words:** quality of life, children, children's dermatology life quality index

### Abstract

**Objectives:** The aim of the study was to assess the validity and reliability of the Turkish version of the Children's Dermatology Life Quality Index (CDLQI).

**Methods:** The CDLQI is a 10 item dermatology specific-index developed originally in English. Using a standard "forward-backward" translation procedure, the English language version of the questionnaire was translated into Turkish language by four bilinguals. One hundred and fifty four children with skin problems and 58 children with problems unrelated to the skin completed both the Turkish CDLQI and the Turkish KINDL® questionnaires. Internal consistency was tested using the *Cronbach*  $\alpha$  value. KINDL® was used in parallel with CDLQI in order to test convergent validity.

**Results:** One hundred and fifty four children with skin problems (65 boys and 89 girls; mean age 11.83 years) and 58 children with problems unrelated to the skin (25 boys and 33 girls; mean age 11.20 years) completed both the Turkish CDLQI and the Turkish KINDL® questionnaires. The reliability of the Turkish CDLQI questionnaire was obtained by *Cronbach's* alpha coefficient ( $\alpha = 0.82$ ). There were no statistically significant differences in the subscales and total CDLQI scores according to the gender (*Student's* t-test,  $p > 0.05$ ). There was no correlation of the subscales and total CDLQI with age (*Pearson* correlation test,  $p > 0.05$ ). The total score of CDLQI was found to be related to all seven subscales of the KINDL® with negative correlation. The total score of KINDL® was found to be related to all subscales (except "treatment" subscale) of the CDLQI with negative correlation.

**Conclusion:** The results of this study have demonstrated that the translated version of CDLQI is reliable and valid, and therefore available to measure the quality of life in Turkish children with skin diseases.

### Introduction

Skin diseases are usually not life-threatening, but can affect the social relationships, daily activities and emotional conditions of the patients [1]. Many generic instruments such as KINDL® and Pediatric Quality of Life Inventory have been designed to measure the quality of life in various diseases for pediatric patients [2, 3]. Children's and Teenagers' versions of KINDL® which was

originally designed in German language was validated and developed for the Turkish children [4, 5, 6]. Dermatology Life Quality Index (DLQI) translated and validated for the Turkish adult patients who have dermatological diseases [7]. Children's Dermatology Life Quality Index (CDLQI) is a dermatological disease-specific QoL measure for the children aged 5-16 years. It was originally created in English by Lewis-Jones and Finlay [8].

The aim of this study was to translate the CDLQI into Turkish, to adapt it culturally, and to evaluate its reliability and validity in the assessment of Turkish pediatric patients with various skin diseases.

## Materials and Methods

The Children's Dermatology Life Quality Index (CDLQI) is a 10-item Health Related Quality of Life (HRQoL) questionnaire specific to dermatological diseases for use in children between the ages of 5-16 years. This index was developed and validated by Lewis-Jones and Finlay [8]. Questions are classified to subscales: Symptoms and feelings (questions 1 and 2), leisure (questions 4, 5 and 6), school or holidays (question 7), personal relationships (questions 3 and 8), sleep (question 9), treatment (question 10). Each question of the CDLQI is answered by "not at all", "only a little", "quite a lot" or "very much" and was scored 0, 1, 2 or 3, respectively. In question 7 the answer "prevented school" was scored 3-the same as "very much". The CDLQI score was calculated by summing the scores of the 10 questions. The higher score means that, the more quality of life is impaired.

We obtained written permission from the copyright holders of the CDLQI to translate it into the Turkish language. The procedures to produce a properly validated translation were followed. Two forward translations into Turkish were carried out by two independent bilingual native Turkish translators. These two translators then discussed their translations and agreed on a conjunct Turkish version. This consensus version was back translated into English by third and fourth independent bilingual translators. These two distinct translations were reviewed by the copyright holders. The discrepancies from the original English version were corrected by further back translation, and the Turkish version was finalized. Pilot testing on 10 patients with various dermatological diseases was then conducted using the Turkish version, and the content validity and language were reviewed.

The study is conducted between December 2006 and September 2007 at Mustafa Kemal University Hospital, Hatay, Turkey. One hundred and fifty four children with various dermatological diagnoses, aged 5-16 years attending to the dermatology out-patient clinic, and 58 children with problems unrelated to the skin attending to the general paediatric out-patient clinic were included in this study. Besides CDLQI the KINDL® questionnaire was also applied consequently to the same patients. The KINDL® questionnaire, a well-documented and widely used generic health-related QoL scale in children and adolescents, was used in parallel to the CDLQI in order to test convergent validity. The permission for the use of

this study instrument obtained from the developers. This 30 item generic instrument has seven sub-scales: physical functioning, emotional well-being, self-esteem, family, friends, school and disease module. The response scale is from 1 (never) to 5 (all the time) for children and adolescents who are 8 to 16 years old. For the children who are 4 to 7 years old, the response scale includes from 1 (never) to 3 (all the time). The sum of the scores of the total and the seven KINDL® subscales were computed and transformed (range: 0 lowest to 100 highest) using the algorithm provided by the developer. Higher scores indicate better health. The reliability and validity of the KINDL® questionnaire was previously estimated among children with and without chronic illnesses, including diabetes, and was found to be satisfactory [2, 9]. It was validated for Turkish in 2004 by Eser et al [4-6].

The data of CDLQI application were used for reliability and validity analyses. The children were given unlimited time to complete the questionnaires. A minority of younger children received help from their parents as necessary. Their parents could read the questionnaires aloud, but did not influence them.

Informed consent was obtained from all the parents. The research protocol was approved by the university hospital ethical committee.

The severity of the skin disease was scored between 1 and 5 (1: mildest, 5: most severe) by a dermatologist who had no knowledge of the children's CDLQI score during the assessment.

## Statistical analysis

The CDLQI is scored between 0-30 and the KINDL® 0-100. Internal consistency and item-total score correlations were used for reliability analysis. Internal consistency was tested using the Cronbach a value, where as item-score and total score relationships were explored by using the Spearman correlation analysis. KINDL® was applied in order to test convergent validity. Validity analysis was performed using the construct and convergent validity. Construct validity was investigated by testing for principal components factor analysis. Convergent validity was determined by Pearson correlation analysis. The relationship between CDLQI scores and both age and gender was tested by Pearson correlation and Student's t-test, respectively. Nonparametric Spearman correlation test was also used for the analysis of the correlation between the CDLQI scores and physician-rated disease severity. Discriminative analysis for the patients with problems unrelated to skin and patients with skin disease was performed by Student's t test. The statistical analysis was performed using SPSS for Windows, version 13; Chicago, IL.

**Table 1.** Distribution of Subjects According to Type of Diagnosis

Type of Diagnosis	n (%)	CDLQ Score (mean ± SD)	Mean Physician-Rated Disease Severity
Problems unrelated to skin	58 (27.4%)	0.72 ± 1.11	-
Skin diseases (total)	154 (72.6%)	6.71 ± 5.17	2.45 ± 0.99
Eczema	32 (15.1%)	8.97 ± 5.46	2.88 ± 0.94
Acne	39 (18.4%)	6.33 ± 4.69	2.51 ± 1.05
Psoriasis	6 (2.8%)	7.67 ± 4.08	2.33 ± 0.52
Scabies	9 (4.2%)	9.11 ± 6.66	2.56 ± 1.24
Warts	21 (9.9%)	3.71 ± 2.65	2.10 ± 0.63
Moles and nevi	7 (3.3%)	3.43 ± 3.51	1.43 ± 0.79
Alopecia	6 (2.8%)	7.00 ± 5.18	2.67 ± 1.37
Molluscum	6 (2.8%)	3.67 ± 3.08	1.83 ± 0.75
Urticaria	11 (5.2%)	7.91 ± 5.56	2.55 ± 1.04
Miscellaneous	17 (8%)	6.94 ± 6.23	2.41 ± 1.00

**Table 2.** Distribution of Total Score and Subscale Scores of CDLQI and Subscale (item) Total Correlations in Group of Patients with Dermatological Diseases

Subscale	Mean ± SD	Min / Max	Subscale Total Correlation*
Symptomes and Feelings	1.75 ± 1.66	0/6	0.723
Leisure (item 4, 5 and 6)	1.18 ± 1.72	0/9	0.775
School of Holidays (item 7)	0.54 ± 0.94	0/3	0.679
Personal Relationships (item 3 and 8)	0.67 ± 1.25	0/6	0.564
Sleep (item 9)	0.51 ± 0.88	0/3	0.571
Treatment (item 10)	0.42 ± 0.73	0/3	0.417
Total Score	5.07 ± 5.18	0/25	1.00

\* Spearman Rho, p < 0.001

**Results**

The Turkish version of CDLQI was administered to a group of 10 subjects with and without skin diseases to satisfy its comprehensibility. All the items were noted to be relevant to the sociocultural context.

One hundred and fifty four children with skin problems (65 boys and 89 girls; mean age 11.83 years) and 58 children with problems unrelated to the skin (25 boys and 33 girls; mean age 11.20 years) completed both the Turkish CDLQI and the Turkish KINDL® questionnaires.

The diagnoses of the study patients are shown in **Table 1**. The miscellaneous group included vitiligo (n=4), impetigo (n=3), eczema seborrhoicum (n=3), tinea (n=5) and erythrokeratoderma variabilis (n=2).

Scores of the CDLQI in patients with dermatological diseases ranged from 0 to 25 (mean ± SD, 6.71 ± 5.17). Scabies and eczema caused the greatest impairment, with the highest CDLQI scores (mean scores 9.11 and 8.97, respectively). Scores of the CDLQI in patients who had diseases unrelated with the skin ranged from 0 to 4 (mean ± SD, 0.72 ± 1.11). Nonparametric *Spearman* correlation analysis showed positive and significant correlation between the CDLQI scores and physician-rated disease severity (rho=0.780, p<0.01.)

The reliability of the Turkish CDLQI questionnaire was obtained by *Cronbach's* alpha coefficient (a=0.82). The distribution of CDLQI scores and subscale scores are presented in Table 2. The subscales versus total correlation coefficient ranged from 0.417 to 0.775 (**Table 2**).

**Table 3.** Factor Loading of Two-Factor Solution (Rotated) of CDLQI Items

CDLQI items	Factor 1	Factor 2	Only One-Factor Solution
1	<b>0.722</b>	0.106	<b>0.626</b>
2	0.302	<b>0.620</b>	<b>0.626</b>
3	0.070	<b>0.832</b>	<b>0.586</b>
4	<b>0.596</b>	0.224	<b>0.633</b>
5	<b>0.559</b>	0.444	<b>0.714</b>
6	<b>0.610</b>	0.144	<b>0.563</b>
7	0.515	<b>0.545</b>	<b>0.743</b>
8	0.108	<b>0.774</b>	<b>0.573</b>
9	<b>0.742</b>	0.090	<b>0.632</b>
10	<b>0.580</b>	0.162	<b>0.554</b>

Principal Component Analysis: Varimax Rotation

**Table 4.** Convergent Validity of CDLQI with KINDL Scale (Correlation Matrix Between Subscales of Both Instruments) in Group of Patients with Dermatological Diseases

KINDL Subscales	CDLQI Subscales						
	Symptoms & Feelings	Leisure	School or Holidays	Personal Relationship	Sleep	Treatment	Total
Physical	-0.340**	-0.272**	-0.346**	-0.311**	-0.274**	-0.137	-0.430**
Emotional	-0.300**	-0.281**	-0.274**	-0.302**	-0.212**	-0.136	-0.392**
Self-esteem	-0.209**	-0.281**	-0.183*	-0.094	-0.178*	-0.108	-0.279**
Family	-0.190*	-0.130	-0.116	-0.117	-0.189*	-0.044	-0.203*
Friends	-0.162*	-0.127	-0.200*	-0.215**	-0.194*	-0.009	-0.232**
School	-0.121	-0.235**	-0.166*	-0.171*	-0.158	-0.131	-0.252**
Total	-0.244**	-0.293**	-0.260**	-0.262**	-0.252**	-0.101	-0.368**
Disease	-0.236*	-0.216*	-0.370**	-0.356**	-0.161	-0.029	-0.347**

Pearson Correlation Coefficients: \*\* Correlation is significant at the 0.01 level (2-tailed)  
 \* Correlation is significant at the 0.05 level (2-tailed)

Factor analysis was performed to determine the Turkish version of the CDLQI is a two-dimensional measure. Two factors were extracted from the factor solution of the CDLQI items. Loadings of each item on the first and second components are shown in **Table 3**.

There were no statistically significant differences in the subscales and total CDLQI scores according to the gender (Student's t-test,  $p > 0.05$ ). There was no correlation the subscales and total CDLQI with age (Pearson correlation test,  $p > 0.05$ )

Table 4 presents the Pearson correlation coefficients between subscales of CDLQI and KINDL®. The total score of CDLQI was found to be related to all seven subscales of the KINDL® with negative correlation. The total

score of KINDL® was found to be related to all subscales (except "treatment" subscale) of the CDLQI with negative correlation (**Table 4**).

**Discussion**

The use of HRQoL questionnaires in medicine has become an increasing trend over the recent years. These questionnaires provide helpful information for clinical researches, definition of the patients' needs and medical-economic assessment. The CDLQI questionnaire is a well-known and widely used dermatology-specific HRQoL instrument for measuring the effects of various skin diseases on paediatric patients [8]. CDLQI has been translated into various languages [10].

This study has provided: validation and reliability of the Turkish version of the CDLQI and cross-validation of Turkish version of the CDLQI, with the KINDL® which is a well-established HRQoL measure for children. KINDL® includes 30 items and determines seven subscales of functional conditions. The total score of CDLQI was found to be related to all seven subscales.

Reliability was associated by internal consistency of the Turkish version of the CDLQI obtaining Cronbach's alpha coefficient and validity tested by convergent validity showed a quite satisfactory result (a value = 0.82).

The mean CDLQI score for dermatology patients in this study was  $6.71 \pm 5.17$  that is higher than that obtained by Lewis-Jones and Finlay (mean 5.13), Chuh (mean 4.43) and, Beattie and Lewis-Jones (mean 5.73) [8, 10, 11]. This difference can be attributed to the proportion of the samples including various skin diseases and levels of severity.

In the current study, in order of scabies, eczema, urticaria and psoriasis caused the greatest impairment, with the highest CDLQI scores and, revealed a well-accordance with other studies. In the original and Cantonese version of the CDLQI, the diseases including scabies, eczema, acne and psoriasis had highest scores for CDLQI, respectively [8, 10]. Beattie and Lewis-Jones also reported highest scores for CDLQI in psoriasis, eczema and urticaria, respectively [11]. Examination of responses to individual subscales is important when evaluating HRQoL measures. The highest scoring subscale on the CDLQI questionnaires was the "symptoms and feelings" subscale, and demonstrated a well-accordance with the original version. However, the mean score (1.75) was higher than that of the original version (1.05). This difference can be attributed to the levels of disease severity. Scores of the Turkish version of CDLQI was not associated with age and gender.

The results of this study have demonstrated that the translated version of CDLQI which was cross validated with KINDL® is reliable and valid, and therefore suitable for measuring quality of life in Turkish children with skin diseases. This is the first dermatology-specific HRQoL instrument for children

translated to Turkish, and will give an opportunity for new investigations.

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