The Validity and Reliability of the Dermatology Life Quality Index (DLQI) in Thais

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ABSTRACT:

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The Dermatology Life Quality Index (DLQI) is a simple and validated 10-item English language-questionnaire designed to measure and compare disability resulting from dermatological conditions. It has been adapted into many languages. The purpose of this study is to evaluate the validity of the Thai version of the DLQI by measuring and comparing disability resulting from a variety of common dermatological conditions. In order to assess its validity, the Thai version of the DLQI was completed by 200 first-time patients attending the dermatology clinic, Siriraj Hospital, Mahidol University and the results were compared to those of 100 healthy volunteers. In order to assess its reliability, the completed DLQI questionnaires from 50 patients using a 1 week

test-retest method were analyzed. Patients took between 1 and 5 minutes to complete the Thai version DLQI questionaire. The mean overall DLQI score of the 200 patients in this study was 9.8(SD 6.9), and for volunteers in the control group was 0.7(SD 1.2). The scores of the patients with urticaria, psoriasis, eczema, acne, vitiligo, fungal infection and melasma were significantly higher than those of the control group ($p<0.0001$), indicating high validity of the DLQI Thai version. The scores of the patients with urticaria, psoriasis, eczema, acne, vitiligo fungal infection and melasma were also significantly higher than those of patients with viral wart, seborrheic keratosis, moles and benign skin tumors. Test-retest reliability were assessed using weighted "kappa (K_w) score" for each question . The K_w ranged from 0.70 to 0.86 which indicated good agreement. For total score, the intraclass correlation coefficient (r_I) was 0.96 (95% CI = 0.92, 0.98) which indicated good reliability. The Thai version of the DLQI has high validity and good reliability. It is a useful easily and rapidly administered instrument for measuring the QOL for patients with various skin diseases in Thais.

Keywords: Thai, validity, DLQI, skin diseases, quality of life

บทคัดย่อ:

กนกวลัย กุลทนันทน์*, สุขุม เจียมตน*, รังสิมา วณิชภักดีเดชา*, สุนันทา ฉันทรุจิกพงศ์.** **การศึกษาความเที่ยงตรงของแบบสอบถาม DERMATOLOGY LIFE QUALITY INDEX ในคนไทย วารสารโรคผิวหนัง 2547; 20: 113-123.**

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Dermatology Life Quality Index (DLQI) เป็นแบบสอบถามคุณภาพชีวิตภาษาอังกฤษที่ง่าย สั้น มีคำถาม 10 ข้อ และได้ทำการทดสอบความเที่ยงตรงเชื่อถือได้แล้วในผู้ป่วยโรคผิวหนัง ได้มีการแปลแบบสอบถามนี้เป็นภาษาต่างๆ คณะผู้วิจัยต้องการทดสอบความเที่ยงตรงเชื่อถือได้ของแบบสอบถาม DLQI ฉบับภาษาไทย การทดสอบความตรง (Validity) ทำโดยให้ผู้ป่วยใหม่ที่มารับการรักษาที่ภาควิชาตจวิทยา โรงพยาบาลศิริราช จำนวน 200 คน กรอกแบบสอบถาม DLQI เปรียบเทียบกับคนปกติ 100 คน การทดสอบความเที่ยง(reliability) โดยการทำซ้ำทำโดยให้ผู้ป่วยโรคผิวหนัง 50 ราย กรอกแบบสอบถาม DLQI ซ้ำ 2 ครั้งในเวลาห่างกัน 1 สัปดาห์

เวลาที่ใช้กรอกแบบสอบถามอยู่ระหว่าง 1-5 นาที ค่าเฉลี่ยคะแนนรวม DLQI ของผู้ป่วย 200 รายคือ 9.8 (SD 6.9) ของคนปกติคือ 0.7 (SD 1.2) คะแนนของผู้ป่วยกลุ่มโรคลมพิษ, สะเก็ดเงิน, ผื่นผิวหนังอักเสบ, สิว, ด่างขาว, เชื้อราที่ผิวหนัง และฝ้า มากกว่าคะแนนของกลุ่มคนปกติอย่างมีนัยสำคัญทางสถิติ ($p<0.0001$) บ่งว่าค่าความตรงของ DLQI ภาษาไทยสูง นอกจากนี้คะแนนของกลุ่มผู้ป่วยโรคลมพิษ, สะเก็ดเงิน, ผื่นผิวหนังอักเสบ, สิว, ด่าง

ขาว, เชื้อราของผิวหนัง และฝ้ายังสูงกว่ากลุ่มคนไข้โรคหูด , กระเนื้อ, ไฝ, เนื้องอกผิวหนังชนิดไม่ร้ายแรงอย่างมีนัยสำคัญทางสถิติ การทดสอบความเที่ยงของแบบสอบถามโดยการทำซ้ำ ประเมินโดยใช้ weighted "kappa (Kw) score" สำหรับแต่ละคำถามและพบว่าค่า Kw อยู่ระหว่าง 0.7 ถึง 0.86 ซึ่งบ่งว่าดี ค่าคะแนนรวมทั้งหมดประเมินโดยใช้ค่า intraclass correlation (r_1) คือ 0.96 (95%CI = 0.92, 0.98) บอกว่าการทดสอบความเที่ยงโดยการทำซ้ำ ดีเช่นกัน โดยสรุป แบบสอบถาม DLQI ภาษาไทย มีความเที่ยงตรงเชื่อถือได้ (validity และ reliability) สูง สามารถใช้เป็นเครื่องมือวัดคุณภาพชีวิตของผู้ป่วยโรคผิวหนังคนไทยที่ทำได้ง่ายและรวดเร็ว

คำสำคัญ: คนไทย, ความตรง, โรคผิวหนัง, คุณภาพชีวิต

Skin diseases have been recognized as having a detrimental effect on the patients' quality of life(QOL)[1, 2]. Many aspects of QOL may be affected by a particular disease so disease-specific QOL survey questionnaires were developed for acne[3], atopic dermatitis[4], psoriasis[5] and other dermatoses[6]. However, there is a need for an easy-to-use, compact, uniform measurement tool, applicable to patients with any skin diseases that can use for patient QOL assessment in routine clinical practice. Recently, more broad dermatologic questionnaires have been developed that enable the physician to follow-up an individual or population with cutaneous diseases. English–language instruments currently available for QOL assessment relating to dermatological conditions are the Dermatology Life Quality Index (DLQI)[7], Dermatology Quality-of-life scales (DQOLS)[8], Dermatology-specific Quality of life (DSQL)[9], Impact of Skin Disease Scale (IMPACT)[10], Patients Generated Index[4], and SKINDEX[11-13].

The Dermatology Life Quality Index (DLQI) was developed in Wales by Finlay and Khan to measure the effects of skin disorders on the quality of patients' lives. This DLQI is a simple, validated 10-item questionnaire designed to measure and compare disability related to different skin conditions. Finlay and others[14-16] have used and validated this DLQI in measuring and comparing disability in a variety of common skin diseases such as eczema[17], psoriasis[7], acne[18], vitiligo[19], and urticaria[20]. G de Tiedra et al [21] analyzed the instruments for QOL assessment in dermatology practice and concluded that the DLQI is suitable for use as a transcultural equivalent instrument for international research. The DLQI has been adapted into many languages such as Danish[16], Norwegian[22] etc. The purpose of this study is to evaluate the validity of the Thai version of the DLQI in measuring and comparing disability occurring from a variety of common dermatological conditions in the Thai and to assess the reliability of the DLQI in the Thai.

Materials and Methods

The DLQI questionnaire

Dr. A.Y. Finlay kindly gave formal permission to Dr. K Kulthanan to use and translate "The

Dermatology Life Quality Index" (DLQI). This research was approved by the Siriraj Hospital Institutional Review Board. The DLQI questionnaire was first translated into Thai and then back to English by a biligual person to ensure that the Thai-translated version was correct and did not introduce any misconceptions or misunderstandings. The questionnaire consists of 10 questions, each referring to the previous 7 days. The question covers work, leisure, daily activities, personal relationships and treatments. Each question has 5 possible answers: 'not relevant (not applicable)', 'not at all', 'a little', 'a lot', or 'very much' with the corresponding scores of 0, 0, 1, 2 and 3, respectively. The questions are simple and short and the questionaire takes only a few minutes to complete. The DLQI total score is calculated by adding the scores of 10 questions, with a maximum score of 30 and minimum score of 0. The higher the score, the greater the impairment on quality of life.

Patients

To assess the validity of the Thai version DLQI questionnaire, 200 patients over the age of 18 years old were recruited from the dermatology outpatient clinic at Siriraj Hospital, Mahidol University from April 2003 to July 2003. The purpose of the study was explained to all patients and informed consent was given. The DLQI questionnaire was explained to all participants before they filled out the questionnaire.

One hundred healthy volunteers were randomly selected from hospital personnel to be in the control group. The criteria for the selection of control group participants were that they should not have visited their doctors during the previous 3 months, they should have had no skin problems or other systemic medical diseases over this period, and they should not have any apparent disability.

To assess the reliability of the DLQI, 50 patients with a variety of skin diseases were recruited from the dermatology outpatient clinic. After the purpose of the study was explained, the DLQI questionnaire was given to the patients to complete. After 7 to 10 days, the same patients were asked to return to the outpatient clinic to complete the DLQI questionnaire again.

Statistical Data Analysis

To determine whether or not the self-administered DLQI questionnaire has constructed validity, and the ability to differentiate quality of life among subjects with and without various skin diseases, the questionnaire responses were evaluated using both the total score and individual question score by the Mann-Whitney U test. The overall DLQI score for each skin disease category were also compared using Kruskal-Wallis one-way ANOVA test.

With regard to the internal consistency of the questionnaire, Spearman's rank correlation and Cronbach's alpha were employed to assess the consistency of responses between questions.

Since this questionnaire is self-administered, the reliability or reproducibility of the questionnaire was examined using the test-retest reliability via weighted kappa statistic and intraclass correlation coefficient.

All statisical data analysis was performed using SAS 8.0. Two-sided significance level of 0.05 was applied in all statistical tests.

Table 1. Comparison of DLQI in patients with and without skin diseases between Finlay and Kahn's and our study.

Diagnosis	DLQI-FK's study			DLQI-Our study		
	N*	Mean (SD)	Range	N	Mean (SD)	Range
Controls	100	0.5 (1.1)	0-6	100	0.7(1.2)	0-6
Patients	200	7.3 (6.3)	0-28	200	9.8(6.9)	0-26
Atopic eczema	13	12.5 (4.8)	6-23	0	-	-
Pruritus	9	10.5 (5.8)	3-22	0	-	-
Psoriasis	52	8.9 (6.3)	0-28	27	12.9(6.9)	1-25
Other eczema	17	8.6 (6.5)	2-27	38	10.9(6.4)	1-26
Acne	18	4.3 (3.1)	0-11	18	10.6(5.5)	3-26
Viral wart	12	6.7 (5.6)	2-22	3	1.3(1.2)	0-2
Solar keratosis	5	3.4 (1.5)	2-6	0	-	-
Basal cell carcinoma	8	2.0 (2.2)	0-6	0	-	-
Seborrheic Keratosis	5	1.8 (0.8)	1-3	3	1.3(1.5)	0-3
Moles	7	1.0 (1.4)	0-4	2	0.5(0.7)	0-1
Urticaria	NA**	NA	NA	20	14.1(4.9)	6-24
Vitiligo	NA	NA	NA	11	8.8(3.7)	4-14
Fungal infection	NA	NA	NA	14	6.5(5.2)	1-21
Melasma	NA	NA	NA	10	6.0(6.0)	0-18
Benign tumors	NA	NA	NA	8	3.0(3.2)	0-10
Miscellaneous	54	6.9 (6.9)	0-28	46	9.7(7.8)	0-26

N* = number of patients, NA = not available**

Table 2. Comparison of each question of DLQI between controls and patients

Question	Group*	Percentage					Mean DLQI** (SD)
		Not at all (0)	A little (1)	A lot (2)	Very much (3)	Not relevant (0)	
1. Itchy /sore/ painful/	C	68.0	32.0	-	-	-	0.32 (0.47)
stinging skin	P	27.0	28.5	23.5	21.0	-	1.38 (1.10)
2. Embarrassment	C	89.0	9.0	2.0	-	-	0.13 (0.39)
	P	26.0	22.5	25.0	25.5	1.0	1.49 (1.14)
3. Shopping/home	C	93.0	6.0	1	-	-	0.08 (0.31)
	P	35.0	22.5	22.5	18.5	1.5	1.23 (1.13)
4. Clothes	C	91.0	8.0	-	-	1.0	0.08 (0.27)
	P	47.0	18.0	19.5	14.5	1.0	1.01 (1.12)
5. Social activities	C	92.0	7.0	-	-	1.0	0.07 (0.26)
	P	35.0	23.5	22.0	19.5	-	1.26 (1.14)
6. Sport	C	98.0	1.0	-	-	1.0	0.01 (0.10)
	P	42.0	22.0	16.5	15.0	4.5	1.00 (1.11)
7. Working or studying	C	100.0	-	-	-	-	0.00 (0.00)
	P	51.5	21.5	14.5	11.5	1.0	0.85 (1.06)
8. Interpersonal	C	97.0	2.0	-	-	1.0	0.02 (0.14)
problems	P	61.5	22.0	8.0	5.0	3.5	0.53 (0.84)
9. Sexual difficulties	C	73.0	1.0	-	-	26.0	0.01(0.10)
	P	52.5	7.5	5.0	4.0	31.0	0.30 (0.74)
10. Treatment	C	94.0	1.0	-	-	5.0	0.01 (0.10)
difficulties	P	47.5	24.5	17.5	6.0	4.5	0.77 (0.94)

Group* : C = control group, P = patient group, DLQI** = Dermatology Life Quality Index

Results

It took each patient between 1 and 5 minutes to complete the questionnaire. All of the patients and the healthy volunteers completed all 10 questions. Of 100 healthy volunteers, 75 (75%) were female and 25 (25%) were male, with a mean age of 32.1 years (SD 10.6 years) and a range of 20-69 years. Of 200 patients, 134 (67%) were female and 66 (33%) were male, with mean age of 37.2 years (SD 14.3 years) and a range of 17-74 years. No difference in gender was found between patients and healthy controls.

Quality of life assessment

Table 1 shows DLQI scores of patients with various skin diseases and controls. The authors also compared our data from this study with that of Finlay and Khan. The higher the scores, the greater the number and severity of perceived problems.

The mean overall DLQI score for the dermatology patients was much higher than that of the controls (9.8 VS. 0.7). The overall mean DLQI score for Finlay and Khan (FK)'s patients was 7.3(SD 6.3) and for the controls was 0.5(SD 1.1). There was no significant difference in the DLQI scores of patients with skin diseases between men (n=66, mean overall DLQI ± SD =10.2 ± 7.1) and women (n=134, mean overall DLQI ± SD = 9.7 ± 6.7) (p=0.613).

Patients with urticaria had the highest mean DLQI score of 14.1 followed by psoriasis (12.9), eczema (10.9), acne (10.6), vitiligo (8.8), fungal infection (6.5) and melasma (6.0). These figures were significantly higher than those of the controls ($p<0.0001$). The scores of the patients with urticaria, psoriasis, eczema, acne, vitiligo fungal infection and melasma were significantly higher than those of patients with viral wart, seborrheic keratosis, moles and benign skin tumors.

The mean score for each DLQI question for patients and controls is shown in Table 2 and Figure 1. The scores of the patients with skin diseases were higher than controls in all 10 DLQI questions ($p<0.001$). In the patient group, question 2 displayed the highest mean score. In the control group, question 1 displayed the highest mean score. Overall responses were positive more frequently for questions 1, 2, 3, 4, 5, 6 and 7. The three questions most frequently answered "not relevant" were question 9 regarding sexual difficulties, question 10 regarding the treatment difficulties and question 6 regarding performing sports.

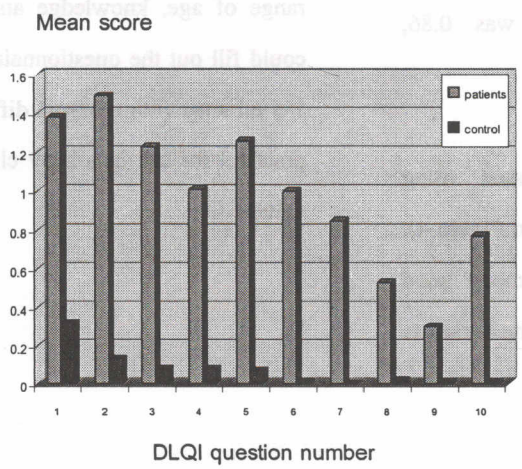

Figure 1. The mean scores of each DLQI question for 200 patients and 100 controls

Table 3. The consistency between paired DLQI questions using the Spearman's rank correlation

Question	1	2	3	4	5	6	7	8	9
2	0.22**								
3	0.33**	0.65**							
4	0.26**	0.45**	0.44**						
5	0.34**	0.68**	0.67**	0.55**					
6	0.27**	0.38**	0.60**	0.42**	0.54**				
7	0.42**	0.36**	0.43**	0.35**	0.45**	0.39**			
8	0.26**	0.40**	0.46**	0.38**	0.50**	0.42**	0.41**		
9	0.22	0.32	0.24*	0.29	0.34	0.30	0.35**	0.40**	
10	0.17**	0.23**	0.19**	0.23**	0.36**	0.24**	0.32**	0.29**	0.17*

Consistency between question responses

The degree of consistency of responses between questions was tested using the Spearman's rank correlation (Table 3) and Cronbach's alpha. The correlation coefficients ranged from 0.17 (questions 1 and 10, questions 9 and 10) to 0.68 (questions 2 and 5). The higher the correlation coefficient, the greater the consistency between two questions. Cronbach's alpha was 0.86, suggesting good consistency.

Reliability

Test-retest reliability was assessed using weighted kappa (K_w) for each question (Table 4). K_w ranged from 0.70 to 0.86 which meant good agreement (>0.7). For the total score, the intraclass correlation coefficient (r_I) was 0.96 (95% CI = 0.92, 0.98) which meant good reliability.

Discussion

This study demonstrates that the Thai version of the DLQI is a useful instrument for obtaining information about the impact of dermatologic disease on Thai patients' QOL. The form is easy to complete. The patients in this study had a wide range of age, knowledge and intellectual ability could fill out the questionnaire rapidly, usually in 1-5 minutes with minimal difficulty. The DLQI is practical for use in a busy clinic and had clinical value.

Table 4. Test-retest reliability for each question (n=50)

Question	K_w	95% CI
1	0.73	0.61, 0.84
2	0.78	0.67, 0.88
3	0.77	0.66, 0.87
4	0.86	0.76, 0.95
5	0.70	0.58, 0.82
6	0.77	0.65, 0.88
7	0.71	0.59, 0.83
8	0.77	0.65, 0.90
9	0.77	0.58, 0.96
10	0.80	0.71, 0.90

It is important to revalidate the DLQI questionnaire when using it in a different language and different culture. Thailand is an Asian country where its people seemed to be embarrassed when they are asked about sex. This may explain the high percentage of answers to item 9 being marked "not relevant". However, Mork C et al[22] reported their study on the DLQI in Norwegian that 19.4% of their patients answered "not relevant" to item 9. Other items with a high percentage of "not relevant" answers in Norwegian were items 3, 6,and 7 which have to do with shopping, sports and working/studying respectively. In the study of Finlay and Khan [7], 98% of the patients answered all 10 questions. The 4 patients who did not answer all questions omitted questions 8 and 9. The patients in the study of Hahn et al[14] in the U.S.A., the most frequently skipped questions were question 2 regarding self-consciousness or embarassment and question 6 regarding participation in sports.

The DLQI scores of the patients who completed the Thai version of the DLQI confirmed that patients with severe and/or chronic skin diseases such as psoriasis, eczema, acne and urticaria had a greater impairment of quality of life than did patients with warts, seborrheic keratosis and benign tumors. In this study, the DLQI was used on patients with active skin problems. Disease severity is also a measure for testing construct validity with QOL. The DLQI score should parallel the severity of disease score and the treatment regimen. However, in this study the severity of disease was not scored. The authors'patients' scores were somewhat higher than the scores of the patients of Finlay and Khan [7] with inflammatory

diseases (such as psoriasis, eczema, acne) but were somewhat lower than those of patients with tumors including seborrheic keratosis and moles. It should be noted here that the authors of this study included only benign skin tumors or growths. The results of this study are similar to those of Finlay and Khan [7] and Hahn et al[14] in that the DLQI scores showed that there was more impact on QOL from inflammatory conditions than from tumors. Because of the differences in genetic and environmental factors, the authors had a small number of patients with adult atopic dermatitis and they were not included in this study. Examples of problems seen in the Asian countries that might be minor problems in European countries were melasma, fungal skin infection, etc So these diseases were separated from the miscellaneous group. There was no available data about these diseases in Finlay and Khan's study.

Similar to the results reported by Finlay and Khan [7], Hahn et al[14], the DLQI did not differ significantly between men and women in this study. However, Zachariae et al[16] found that in their study of DLQI in Danish inpatients and outpatients, women had significantly higher scores than men on all items except item 3.

The test-retest reliability of the overall DLQI scores was high and consistent. The reliability correlations for individual questions were also accepatable.

In conclusion, the DLQI is an easily administered instrument providing a rapid measure of QOL in various skin diseases. Expected benefits for Thai patients are as follows: 1. To provide a patient-oriented measure of disease status for clinical monitoring; 2. To provide comparisons of the importance of different skin diseases; 3. To assess the effectiveness of therapy; 4. To use in the audit of the effectiveness of dermatology clinical services. We hope that the Thai version of the DLQI questionnaire will provide a useful, practical measure for regular use with various skin diseases and in various clinics.

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