

# Validation of Bangla Dermatology Life Quality Index among patients with psoriasis

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## Abstract

**Background** Psoriasis is a chronic skin disease that affects the quality of life significantly. The effect of dermatological disease on patients' quality of life is a minimally addressed issue in Bangladesh due to the unavailability of a standardized measuring tool. This study aimed to validate the Bangla version of the Dermatology Life Quality Index.

**Methods** This validation study was conducted between September 2016 and August 2017. 80 patients with psoriasis were interviewed by the Bangla version of the Dermatology Life Quality Index. The cultural adaptation was ensured by performing the standard forward-backward translation procedure. Reliability was estimated by internal consistency using Cronbach's alpha & test-retest reliability was assessed by the intra-class coefficient. Different forms of validity were assessed.

**Results** The scale demonstrated Cronbach's alpha 0.86 and significant test-retest reliability (ICC=0.97). Construct validity assessing Factor Analysis-Principal Component Analysis with the distribution of varimax rotation of DLQI Bangla ranged from 0.41 to 0.83. There was only one component extracted by principal component analysis with varimax rotation. Face validity, content validity, convergent validity, and criterion validity were found acceptable.

**Conclusion** The adapted Bangla version of DLQI appears to be an acceptable, reliable, and valid instrument for measuring the quality of life in Bangla speaking patients with psoriasis.

## Key words

Bangla DLQI, psoriasis, reliability, validity.

## Introduction

Psoriasis is a chronic and incurable skin disease characterized by circumscribed, erythematous, dry plaques of various sizes with silvery-white lamellar scales.<sup>1</sup> It ravages the quality of life (QoL) of afflicted individuals with a profound impact on the psycho-social aspect of the patient, particularly because of its visibility.<sup>1,2</sup> The QoL of patients with psoriasis is reported to

be lower than that of patients with certain diseases such as cancer, hypertension, and diabetes.<sup>4</sup>

In recent years, the importance of clinical symptoms as well as QoL has been recognized for the assessment of the therapeutic effects in psoriasis. Studies have shown that doctors and patients differ in their assessment of severity.<sup>5</sup> While doctors quantify the severity of psoriasis based on symptom severity and area of skin lesions, patients focus on impaired activities of daily living or their quality of life. Therefore, when assessing severity, it is important to assess not only the severity of skin lesions but also

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QoL. The severity of psoriasis had been measured by clinical assessments alone for a long time. The psoriasis area and severity index (PASI) is the most widely used clinical assessment tool.<sup>6</sup> Now, QOL is thought to be one of the important factors in assessing the severity of psoriasis. It can also provide a measure of the clinical efficacy of dermatological therapies.<sup>7</sup>

The Dermatology Life Quality Index (DLQI) is one of the useful QoL assessment instruments in psoriasis which was developed in the UK by Finlay and Khan (1994) to evaluate the quality of life in a range of skin conditions.<sup>8</sup> The DLQI is the first dermatology specific health-related quality of life questionnaire and has been validated and used widely. It is a reliable, validated 10-item questionnaire covering six dimensions (symptoms and feeling, daily activities, leisure, work and school, personal relationships and treatment) which assess the overall impact of skin disorders and current treatment on the patient's functioning and wellbeing. Each question has four possible responses, with lower scores representing a better QoL.<sup>8,9</sup>

The DLQI is a simple, compact, and practical questionnaire for assessing the QoL in a dermatology clinical setting. Many psoriasis studies have evaluated QoL using DLQI in western countries but little is known about the QoL of psoriasis patients in Bangladesh. To the author's best knowledge the validation study of the Bangla version of DLQI was yet to be conducted in our country. Therefore, we aimed to validate the Bangla version of the Dermatology Life Quality Index (DLQI).

## **Methods**

**Ethical Aspects** Ethical aspects of the study were carefully maintained. The study was

conducted complying with the declaration of Helsinki (1964). Permission was taken from the originator of the instrument. Institutional Review Board (IRB) approval was taken from Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka (BSMMU/2014/71718). Informed written consent was obtained from the patients without any influences and confidentiality was maintained properly.

**Adaptation of DLQI Bangla** The adaptation of DLQI to Bangla was accomplished by following the standard forward-backward translation methods.<sup>10,11</sup> One dermatology resident and one general person who were native speakers of Bangla and fluent in English did the forward translation. The forward translated versions were checked, compared, compiled, and merged into a single Bangla forward version. Then the compiled forward form was back-translated into English by a professional translator with understanding in medical translation and by another dermatology resident. The back-translated versions were checked, compared, compiled, and merged into a single version. After that, all the versions were submitted to the expert committee framed for this study. Subsequent modifications were done based on the expert committee recommendations to ensure the semantic, idiomatic, experiential, and conceptual equivalence and a pre-final questionnaire was prepared for pre-testing. The pre-testing was performed among 30 patients with psoriasis and the questionnaire was finalized.

## **Instruments**

1. A semi-structured questionnaire containing the socio-demographic variables of the respondents.
2. Bangla DLQI obtained from the adaptation process.
3. Bangla SF-36: The Bangla SF-36 is a self-

administered questionnaire with acceptable reliability and validity.<sup>12</sup> It consists of eight domains mentioning as the physical function (PF), role physical (RP), body pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH).

4. Psoriasis Area Severity Index (PASI): The psoriasis area severity index is the most widely used clinical assessment tool in psoriasis to measure the severity & extent of psoriasis. Briefly, the body is divided into four sections, head (H) (10% of a person's skin); upper extremities (U) (20%); trunk (T) (30%); lower extremities (L) (40%). Each of these areas is scored by itself, and then the four scores are combined into the final PASI. For each section, the percent area of psoriatic lesions is estimated and then transformed into a grade from 0 to 6. Here (0=None, 1=1-9%, 2=10-29%, 3=30-49%, 4=50-69%, 5=70-89%, 6=90-100%). Within each area, the severity is estimated by three clinical signs: erythema (redness), induration (thickness), and desquamation (scaling). Severity parameters are measured on a scale of 0-4 (0=none, 1=slight, 2=moderate, 3=severe, 4=very severe). The sum of all three severity parameters is then calculated for each section of skin, multiplied by the area score for that area, and multiplied by the weight of respective section (0.1 for the head, 0.2 for upper extremities, 0.3 for the trunk, and 0.4 for lower extremities). PASI scores range from 0 to 72, from no psoriasis to maximal disease respectively, higher PASI score indicates more severe psoriasis.<sup>6</sup> PASI score 0-8, 8-2,  $\geq 12$  indicates mild, moderate, and severe psoriasis respectively.<sup>7</sup>

### **Study Place and Procedure**

This validation study was conducted between September 2016 and August 2017 in the

Department of Dermatology and Venerology, Bangabandhu Sheikh Mujib Medical University. A total of 80 patients with psoriasis was interviewed by the Bangla version of the DLQI by convenient sampling. The sample size was calculated on the basis of the 8:1 ratio of participants to an item based on the previous recommendations of the item sample ratio.<sup>10</sup> Adult patients who were diagnosed as psoriasis by a dermatologist and/or by histopathology report were included in the study. Patients psoriasis and other concomitant dermatological diseases, psychiatric disorders, and other chronic medical illness were excluded. After collection data were analyzed by Statistical Package for the Social Science (SPSS) version 22.0 software.

Reliability was estimated by internal consistency using Cronbach's alpha & test-retest reliability was assessed by the intra-class coefficient. Face validity and content validity were assessed during the adaptation process. Construct validity was assessed by explorative factor analysis. Convergent validity was assessed by comparing it with the SF-36 questionnaire. Criterion validity was assessed by comparing it with the PASI score.

### **Results**

**Demography of the respondents** A total of 80 respondents were enrolled in the study. The mean age was 35.05 ( $\pm 14.23$ ) years ranging from 18 to 80 years. The majority (32.5%) of the patients were on the 18-25 age group, 60.5% were male, 31.25% were service holders, 70% were married, and 32.5% had at least a graduation degree (**Table 1**).

**Figure 1** reveals the distribution of types of psoriasis among the respondents. Among the types of psoriasis, the plaque psoriasis respondents frequency were maximum 54(67.5%), guttate psoriasis was 12(15%),

**Table 1** Demographic variables of respondents (n=80).

Variable	n	%
<i>Age in Years</i>		
18-25	26	32.5
26-35	25	31.25
36-45	13	16.25
46-55	8	10
56 and above	8	10
<i>Gender</i>		
Male	50	62.5
Female	30	37.5
<i>Occupation</i>		
Housewife	15	18.75
Service	25	31.25
Student	15	18.75
Other	25	31.25
<i>Marital Status</i>		
Married	56	70
Unmarried	24	30
<i>Level of Education</i>		
Primary	23	28.75
Secondary	19	23.75
Higher Secondary	9	11.25
Bachelor/Masters	26	32.5
Illiterate	3	3.75
PASI Score (Mean ± SD)	11.7±8.6	
Duration of illness (Mean ± SD)	5.59±6.44 yrs.	
Age of onset (Mean ± SD)	29.14±14.04 yrs.	

erythrodermic 7(8.75%), pustular psoriasis 3(3.75%), inverse psoriasis and palmo-planter psoriasis were same 2(2.5%).

**Characteristics of items and DLQI Bangla**

**Table 2** reveals the scores of DLQI Bangla as a whole and in different domains. The total score was 13.88±5.91 with a minimum of 1 to a maximum of 26. 25% of the respondents had scores up to 10, the 50<sup>th</sup> percentile was 14 and 75th percentile was 18.75 (**Table 2**). Among the domain wise symptoms and feeling domain mean was 3.93±1.6 and it was highest among the other domains. The treatment domain had the lowest score in the mean distribution and was found 1.84±0.91. Other domains were revealed in the table with differences.

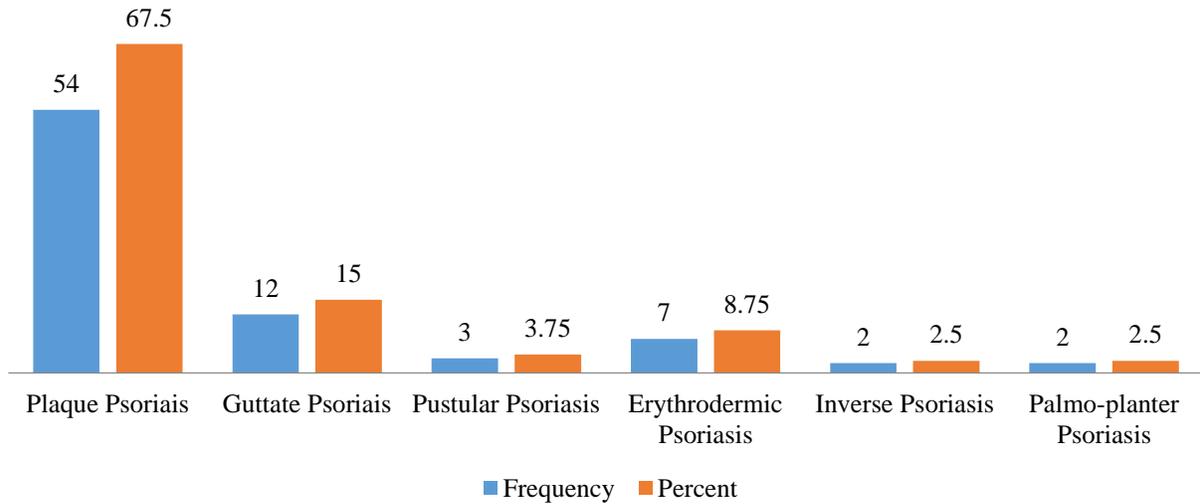
**Table 3** reveals the characteristics of item wise response which reveals the item mean, Standard deviation, extracted communalities, and component matrix distribution of Varimax Rotation. Mean DLQI Bangla score of individual items ranged from 0.38 to 2.23.

**Table 2** Domains of DLQI Bangla.

Domain	Mean	SD	Minimum	Maximum	Percentile		
					25	50	75
Total Score	13.88	5.91	1	26	10	14	18.75
Symptom and feeling	3.93	1.6	0	6	2	3	4
Daily activities	2.79	1.13	0	6	1	2	4
Leisure	1.92	1.01	0	6	1	2	4
Work and school	1.61	0.89	0	3	1	2	3
Personal relationships	1.59	0.98	0	6	1	2	3
Treatment	1.84	0.91	0	3	1	1	2

**Table 3** Item characteristics of DLQI Bangla (n=80).

Item	Mean	SD	Communalities	Component matrix
Q1	1.7	0.8	0.77	0.62
Q2	2.23	0.8	0.89	0.80
Q3	1.39	1.04	0.73	0.42
Q4	1.4	1.1	0.8	0.73
Q5	1.53	0.98	0.81	0.84
Q6	0.39	0.91	0.83	0.77
Q7	1.61	0.49	0.6	0.67
Q8	1.21	1.09	0.62	0.60
Q9	0.38	0.74	0.65	0.81
Q10	1.84	0.91	0.81	0.62



**Figure 1** Types of Psoriasis among the respondents.

**Table 4** Correlation between DLQI Bangla and PASI score measured by Pearson’s Correlation.

	PASI Score	DLQI Score
<i>PASI Score</i>		
Pearson Correlation	1	.567**
Sig. (2-tailed)		.000
<i>DLQI Score</i>		
Pearson Correlation	.567**	1
Sig. (2-tailed)	.000	

\*\* Correlation is significant at the 0.01 level (2-tailed).

The highest score was 2.23 for the item-2 (embarrassment). The lowest score was 0.38 for item-9 (sexual difficulties). Extracted communalities revealed that all the items had values >0.50. Principal Component Analysis with the distribution of Varimax Rotation of DLQI Bangla ranged from 0.41 to 0.83. The highest score was 0.83 for the item-5. The lowest score was 0.41 for item-3. There was only one component extracted.

**Reliability assessment** The reliability was assessed in the form of internal consistency and test-retest reliability. The internal consistency was measured by Cronbach's Alpha ( $\alpha$ ) which was 0.86. The test-retest reliability was measured by Intraclass Coefficient (ICC) which was 0.97.

### Validity assessment

**Face validity and content validity** Face validity and content validity were systematically assessed and maintained properly in every step while adopting the instrument. The members of the expert committee assessed item wise contents.

**Construct validity** Construct validity assessment was performed by Exploratory Factor Analysis (EFA) of the principal component with varimax rotation to detect the factorial structure in DLQI Bangla (**Table 3**). KMO & Barlett’s test of Sphericity was applied to the fitness of data for factor analysis which was 0.79. A value of KMO of greater than 0.60 has been considered an adequate sample size of the study (Arafat *et al.*, 2016). Only one factor was extracted from DLQI Bangla based on values obtained from Principal Component Analysis (PCA).

**Criterion validity** Criterion validity was by Pearson Correlation between PASI Score and DLQI Score which was 0.56 signifying a moderate relationship (**Table 4**).

**Table 5** Correlation between DLQI Bangla and SF-36 score measured by Pearson's Correlation.

SF 36 Domains	DLQI Score	P value
SF 36 Role Physical	-0.69	
SF 36 Role Emotional	-0.70	
SF 36 Mental Health	-0.81	0.000
SF 36 Social Functioning	-0.79	
SF 36 Vitality	-0.76	
SF 36 Pain	-0.45	

**Table 5** shows the Pearson Correlation between the DLQI Bangla score and SF-36 score ranged from -0.45 to -0.81. The highest score was -0.81 for the domain SF-36 Mental Health. The lowest score was -0.45 for domain SF-36 pain. All the components showed a moderate to strong correlation except the pain domain which revealed a slightly mild correlation based on the interpretation statistics mentioned earlier.

## Discussion

To assess the psychometric properties of DLQI Bangla, 80 patients with psoriasis were interviewed to assess the reliability, validity of DLQI Bangla. The mean age of the respondents was 35.05 years and the majority were male and married (**Table 1**). Respondents' age ranged from 18-82 years. The mean age was 40.3 years and male-female were equally distributed in a Sri Lankan study.<sup>14</sup> The Sri Lankan study was conducted among eczema, psoriasis, acne, vitiligo, infections and other dermatology patients.<sup>14</sup> A total of 900 respondents were included in an Italian study and the mean age was 44 years ranging from 18-88 years.<sup>15</sup> The male respondents were 60% that is similar to the present study.<sup>15</sup> In a Chinese study, the mean age was 38.5 years (SD=13.8), 61% were male, 69% were married those are similar to the current study.<sup>16</sup> The mean age was 24.8 years (SD=7.4). In a Japanese validation study,<sup>17</sup> 30.77 years (SD=15.91) in a Turkish validation study.<sup>18</sup>

Among the types of psoriasis, the plaque psoriasis was found as the most common variant

(**Figure 1**). In Italian study generalized plaque psoriasis (54%)<sup>15</sup> and in Chinese study psoriasis vulgaris (92%) was the most commonly reported variant.<sup>16</sup>

Internal consistency of DLQI Bangla was measured by Cronbach's Alpha ( $\alpha$ ) which was revealed 0.86 signifying an acceptable value as per the recommendations.<sup>10</sup> Previous validation studies revealed similar significant internal consistencies measured by Cronbach's Alpha. It was found 0.83 in Italian version,<sup>15</sup> 0.91 in the Chinese version<sup>16</sup> 0.91, 0.83 in the Japanese version,<sup>17</sup> 0.85 in the Turkish version,<sup>18</sup> 0.90 in the Norwegian version<sup>19</sup>, and 0.90 in the Spanish version.<sup>13</sup> So, the internal consistency of DLQI across the studies showed a very significant value, and DLQI Bangla is also aligned with that.

The test-retest reliability measured by the intra class coefficient (ICC) which was found highly significant for the scale (0.97). The interval between test and retest was varied in different studies across the globe and the measures were also varied differently based on the researchers' choice and feasibility of the study. However, the Sinhala version found it 0.83 measured by Kappa value.<sup>14</sup> In the Japanese validation study, it was measured by ICC and Pearson's correlation coefficient and was found significant. In the Spanish validation study, it was assessed by ICC, and the value was found 0.88 which was significant.<sup>13</sup>

Different forms of validity were assessed at different levels of the study in different steps. Face validity was assessed during the translation and back translation steps as well as the expert committee meeting. Content validity was assessed during the translation and back translation steps as well as the expert committee meeting. Moreover, item wise content validity index was assessed and found adequate to retain

the item in the construct. Factor analysis was performed to review the structure of the construct.

The exploratory factor analysis principal component analysis with varimax rotation revealed a single factor comprising the 10 items. The Chinese and the Norwegian versions also found a unidimensional scale.<sup>16,19</sup> However, the Persian and Turkish versions found it as a two-dimensional structure.<sup>13,20</sup>

Criterion validity was assessed by comparing with the PASI score which revealed a moderate relationship (**Table 4**). Different authors used different tests and assessed it by comparing it with different instruments according to the study and feasibility.<sup>10,13</sup>

Convergent validity was assessed by comparing with the certain domains of SF-36 value and interpreted with the Pearson's correlation coefficient. A negatively moderate correlation was found with SF-36 and DLQI Bangla (**Table 5**). A similar correlation was also found in the Sinhala version where  $r$  was found in greater than 0.4.<sup>14</sup> SF-36 correlation was considered as criterion validity assessment in the Sinhala validation study. In the Chinese validation study correlation between the domains of SF-36 and DLQI Chinese<sup>16</sup> was found from 0.52-0.78 in Pearson  $r$  measurement. Whereas in the Japanese validation study,<sup>17</sup> it was considered as concurrent validity. For concurrent validity, the correlations between the DLQI-J score and scores on the "social functioning", "role emotional", "mental health", and "vitality" subscales of the SF-36 were all greater than 0.40.<sup>17</sup> The DLQI was found to be highly related to the physical domain of SF-36 in the Turkish validation study.<sup>18</sup>

There are several limitations to the study. Firstly, it was conducted in a tertiary care

teaching hospital where the samples may not be representative of the community. Secondly, the DLQI is a general dermatology specific instrument, the field testing and psychometric evaluation of the Bangla version in this study was performed in patients with psoriasis only. Generalization of study results may be difficult as the study population covered only psoriasis patients. Thirdly, the original DLQI is a self-administered questionnaire but in this study in a few cases (in the illiterate group) the interviewer helped to complete the questionnaire ensuring the responses solely based on participants' own feelings and opinions. Fourthly, during test-retest, no new intervention was given but the ongoing medication was continued. Inter rater reliability could have been seen for better reliability assessment.

## Conclusion

The Bangla DLQI is the first culturally adapted instrument for assessing the quality of life of Bangladeshi patients with psoriasis which appears to be an acceptable, reliable, and valid instrument for assessing the quality of life among the dermatological patients of Bangladesh. The instrument is useful in clinical as well as research settings. The questionnaire can be further evaluated in different dermatological conditions to confirm the ability to measure and compare across different patients groups. Validation of other instruments measuring the quality of life in dermatology can be conducted. The development of culturally accepted instruments should be considered as a priority.

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