

# Validity and reliability of Persian version of infants' dermatitis quality of life index (IDQOL) questionnaire

Saman Mohammadi, MD <sup>1</sup>  
Saeedeh Farajzadeh, MD <sup>2</sup>  
Hossein Safizadeh, MD <sup>3</sup>  
Maryam Khalili, MD <sup>1</sup>  
Mahin Aflatoonian, MD <sup>1\*</sup>  
Rezvan Amiri, MD <sup>1</sup>  
Elham Mohammadrezakhani, MD <sup>4</sup>

1. Department of Dermatology, Afzalipour Hospital, Kerman University of Medical Sciences, Iran
2. Leishmaniasis Research Center, Kerman University of Medical Sciences, Iran
3. Social Determinants of Health Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran
4. Kerman University of Medical Sciences, Iran

\*Corresponding author:  
Mahin Aflatoonian, MD  
Department of Dermatology, Afzalipour Hospital, Kerman University of Medical Sciences, Kerman, Iran  
Tel: +00989125987542,  
Fax: +983433257477,  
Postal code: 7616913911,  
Email: maaflatoonian@gmail.com

Received: 11 August 2019  
Accepted: 6 November 2019

**Background:** Atopic dermatitis is the most common inflammatory skin disease in children. Severe itching may lead to an impaired quality of life in the patients. In this study, we evaluated the validity and reliability of Persian version of a questionnaire regarding the infants' dermatitis quality of life in children suffering from atopic dermatitis.

**Methods:** When the original authors approved of the Persian version of the questionnaire, the parents completed the questionnaire for their 98 children with atopic dermatitis aged less than four years. We analyzed the data by SPSS 16. Cronbach's alpha and inter-item and calculated the correlations to evaluate the reliability and validity via Kaiser criterion and scree plot.

**Results:** The calculated mean score of questionnaire was  $9.65 \pm 5.41$ . The first (itching and scratching) and eight questions (treatment problems) obtained the highest and lowest scores, respectively. There was a strong, positive correlation between the severity of the disease and the quality of life score in the patients. Cronbach's alpha was calculated as 0.88 which is a sign of good internal consistency of the items. The inter-item correlative coefficients varied between -0.004 to 0.87. We used Kaiser's criterion and scree plot to evaluate the validity and achieve a two-factor solution.

**Conclusion:** Persian version of infants' dermatitis quality of life index questionnaire was valid and reliable.

**Keywords:** validity, reliability, Persian, dermatitis, quality of Life Index

Iran J Dermatol 2019; 22: 139-144

## INTRODUCTION

Atopic dermatitis (AD) is the most common dermatologic disease among the children with a chronic and relapsing course. Approximately 5%-20% of the children suffer from AD worldwide, as it occurs during the first 5 years of life in 90% of the cases <sup>1,2</sup>. The prevalence of AD in children aged

2 to 7 in Kerman has been reported to be 13.52% <sup>3</sup>. Genetic, immunologic, and functional defects in skin barrier are three contributing factors in the pathogenesis of AD.

Depending on the duration of the disease and patient's age, the clinical symptoms of AD may vary. Scaling, erythema, skin dryness, increased skin thickness, crust and erosion formation are

some of the most common symptoms<sup>3,4</sup>.

Severe itching is a significant feature of AD that can lead to irritability, disturbance in sleep, and fatigue during day, and mood alteration. Moreover, limitation in day time activities, leisure, sports, considerable change in life style including type of dressing, bathing and eating habits can damage the impaired quality of life (QoL) of the patients<sup>5,6</sup>.

Previous studies demonstrate high incidence of impaired behavior and attention deficit hyperactivity disorders (ADHD) in AD patients<sup>7</sup>. In order to evaluate the treatment response, it is necessary to measure the disease severity, impact of disease on QoL, and psychological aspects of life<sup>5</sup>.

In order to evaluate the QoL in children less than 4 years old affected with dermatitis, infantile dermatology quality of life (IDQOL) questionnaire developed by Lewis Jones and Finlay in 2001<sup>8</sup>.

In this study, we decided to evaluate reliability and validity of Persian version of this questionnaire in infants with AD.

## MATERIAL AND MEHODS

IDQOL questionnaire has been designed to evaluate dermatitis effects on various aspects of life since a week ago in the children less than 4. This questionnaire encompasses 10 items concerning itching and scratching, mood alteration, treatment problems, the interaction of the disease with hobbies, physical, familial activities, and necessary changes in bathing, dressing, eating and sleep patterns. Each item includes four options with scores ranging from zero to three. The final score is calculated by adding scores of the items that can vary from zero to 30. Higher score represents greater effect of the disease on QoL.

In order to prepare the Persian version of IDQOL, first we received permission from original developers of the questionnaire. Then the original version of questionnaire was translated to Persian by two native bilingual expert translators whose mother tongue was Persian. After concluding an agreement on final version of Persian translation, it was translated back to English by two other trained bilingual English translators. We repeated the process until the original developers officially approved the Persian version.

In order to evaluate the comprehensiveness and clarity of the questionnaire, we asked ten parents

whose children suffered from atopic dermatitis to complete it. After the understandability of the questionnaire was confirmed, we began to assess its validity and reliability. This study was performed in Afzalipour Hospital, Kerman University of Medical Sciences from November to august of 2016. 98 children under four participated. The study included the children diagnosed with AD based on UK working party criteria and those whose parents could read and write the Persian language<sup>9</sup>. It also excluded the children affected with other diseases that could change QoL of patients. After obtaining informed consent from the parents, we recorded sex, age and disease severity based on SCORAD in AD patients and the history of atopy, socioeconomic status, and educational level of the parents<sup>4</sup>. Finally, the parents were requested to complete the IDLQOL questionnaire.

Data analysis was conducted via SPSS 16. Cronbach's alpha and inter-item correlation were calculated to evaluate reliability and Kaiser criterion and scree plot were conducted to assess the validity of the questionnaire. The independent T test was employed to compare SCORAD and QOL score. Pearson correlation test was used for inter-item correlation.

## RESULTS

We enrolled 98 children with AD under 4 with a minimum age of three weeks and maximum of 52 months. 50 percent of the patients were male. Minimum and maximum duration of the disease were between zero to 36.5 months. We found acute, subacute, and chronic dermatitis in 41%, 40% and 14% of the cases, respectively. The most and the least prevalent sites of involvement were head and neck (75.5%) and genitalia (8.2%). 80 percent of questionnaires were completed by mothers and 20% by fathers.

## IDQOL

The obtained mean score was  $9.65 \pm 5.41$  (minimum=0, maximum=28). The highest and the lowest obtained scores belonged to question 1 (itching and scratching) and question 8 (treatment problem). 50 percent of participants achieved the score of nine or less. Nearly 1% of participants acquired floor effect (the least achievable scores),

but none of them obtained the highest achievable score (ceiling effect).

Percentage of scores among the participants in the highest level (ceiling effect) for all of the questions was the least, except for the question 3. Furthermore, percentage of scores in the lowest level (floor effect) for all of the questions was more than 25%, except for question one and two. The mean score, ceiling, and floor effects have been demonstrated in Table 1.

### SCORAD

Mean of SCORAD was 40.1±17.01 (minimum=11.8, maximum=84.1). Based on SCORAD the severity of AD was categorized to three groups of mild (less than 25), moderate (between 25 and 50), and severe (more than 50). Mild disease was observed in 21.4% of the patients. Also, 52.04 % and 26.5% of them had moderate and severe disease respectively. We found a strong and positive relationship between the obtained QoL scores and SCORAD (r=0.66, P<0.001).

### Reliability

In order to evaluate reliability, we calculated Cronbach's alpha that was 0.88 representing a suitable internal consistency among the questions (Table 2). Also, the inter-item correlation coefficient was between 0.004 to 0.87 (Table 3). The least coefficient belonged to question number 3 that was lower than 0.3 (the least range of acceptable coefficient). Also, after deletion of this question,

**Table 3.** Corrected item-scale and Cronbach's Alpha

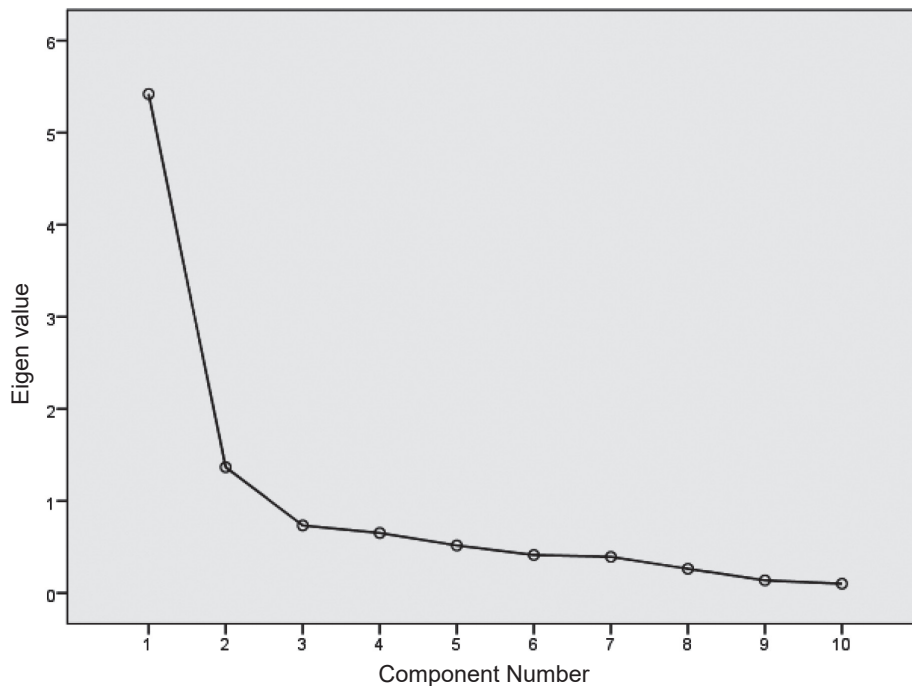
Question number	Corrected item-total correlation	Cronbach's alpha if item was deleted
Q1	0.410	0.883
Q2	0.722	0.861
Q3	0.184	0.912
Q4	0.627	0.869
Q5	0.829	0.854
Q6	0.845	0.854
Q7	0.749	0.860
Q8	0.491	0.878
Q9	0.745	0.860
Q10	0.716	0.862

**Table 1.** Mean score of each item, ceiling and floor effects, and percentage of response rate to each answer

Question number	Subject	Mean±SD	Ceiling effect	Floor effect	Percent of response rate to answers			
					Very much	A lot	A little	Not at all
1	Itching & scratching	1.68±0.60	5.10	2.04	5.1	60.2	29.6	2
2	Child mood	1.16±0.82	8.16	18.37	8.16	18.4	54.1	18.4
3	Time to go to sleep	1.17±1.04	17.35	28.57	17.3	11.2	40.8	28.6
4	Sleeping problems	0.68±0.75	2.04	46.94	2	11.2	38.8	46.9
5	Hobbies disturbance	0.84±0.74	2.04	34.69	2	14.3	48	33.7
6	Family activities disturbance	0.81±0.70	2.04	33.67	2	10.2	53.1	33.7
7	Mealtimes problems	0.82±0.76	2.04	37.76	2	15.3	44.9	37.8
8	Treatment problems	0.58±0.69	1.02	52.04	1	5.1	33.7	49
9	Dressing problems	0.95±0.82	2.04	33.67	2	24.5	39.8	33.7
10	Bath time problems	0.96±0.77	2.04	29.59	2	21.4	46.9	29.6

**Table 2.** Inter-item correlation coefficients of questions

Question number	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	1.000									
Q2	0.377	1.000								
Q3	0.304	0.221	1.000							
Q4	0.322	0.534	0.335	1.000						
Q5	0.368	0.620	0.145	0.570	1.000					
Q6	0.343	0.667	0.132	0.626	0.873	1.000				
Q7	0.298	0.590	0.145	0.524	0.728	0.763	1.000			
Q8	0.100	0.378	0.002	0.239	0.512	0.473	0.519	1.000		
Q9	0.239	0.597	0.023	0.408	0.717	0.741	0.662	0.549	1.000	
Q10	0.304	0.612	0.004	0.438	0.708	0.692	0.546	0.472	0.846	1.000



**Figure 1.** Scree plot and Kaiser's criterion

Cronbach's alpha was increased from 0.87 to 0.92.

**Validity**

To show the validity, Kaiser's criterion and scree plot were employed with two-factor solution, explaining 67.88% of the variance (Figure 1). The factor loading for each item is shown separately in table 4.

**DISCUSSION**

Atopic dermatitis is a chronic inflammatory dermatologic disease with a negative impact on psychological aspects and QoL of patients <sup>5,8,10</sup>.

**Table 4.** Factor loading of each item

Question number	Factor one	Factor two
Q1	0.92	
Q2	0.87	
Q3	0.86	
Q4	0.85	
Q5	0.79	
Q6	0.73	
Q7	0.67	
Q8		0.86
Q9		0.63
Q10		0.53

Previous studies indicated that children with severe eczema have more impairment in QoL than children with other chronic diseases such as asthma, epilepsy, diabetes mellitus, and renal disease <sup>11</sup>.

IDLQOL is a specific QoL questionnaire that evaluates QoL in children under four years old. To date, this questionnaire has been translated to 21 different languages and used in 18 different countries <sup>12</sup>.

In this study, Cronbach's alpha for Persian version of the questionnaire has been estimated as 0.88, representing an acceptable correlation in line with other studies in Italy conducted by Baranzoni ( $\alpha > 0.7$ ) and Neri ( $\alpha = 0.89$ ) <sup>13,14</sup>. The evaluation of inter-item correlation coefficient showed an acceptable connection between the questions except for question 3 with negative coefficient in one item and coefficient of less than 0.2 in five items. Moreover, according to corrected item-scale calculation, question 3 had the correlation coefficient of less than 0.3 (0.184), and after the deletion of question number 3, Cronbach's alpha was increased to 0.92. Regarding to high first Cronbach's alpha (0.88), we finally decided to preserve question 3 in the results with no change.

In one study by Alzolibani in Saudi Arabia on 370 infants with AD, Cronbach's alpha was

reported 0.87 that was compatible with our results<sup>15</sup>. However, unlike our study, the rate of corrected item correlation in all of the questions was more than 0.3 and Cronbach's alpha would be nearly equal to the first Cronbach's alpha, if each item were deleted. In the current study, the evaluation of validity based on factor analysis led to two-factor solution explaining 67.88% of the variance. According to this analysis, question 1, and 3 are situated in different factor loading from other questions.

Lewis-Jones *et al.* estimated the Mean score of QoL in AD infants as  $7.89 \pm 5.74$  which was less than our results ( $9.65 \pm 5.40$ )<sup>8</sup>. This difference can be explained by higher severity of AD of patients in our study. The higher acquired score in descending order belonged to question 1 (itching and scratching), question 3 (average time to sleep), question 2 (child's mood) and the lowest score belonged to question 8 (treatment problems). In most of previous studies, itching, mood alteration and sleep disturbance were the most common symptoms leading to the impairment of QOL that was nearly compatible with our results<sup>12-14</sup>.

In our study, there was no correlation between sex of the patients and QoL that was compatible with Ganemo, Kim and Alanne studies<sup>16-18</sup>. Other studies have confounding results, while in some of which a lower QoL has been found in girls, others have the opposite results<sup>12,19</sup>. For example, Ražnatović *et al.* in Belgrade demonstrated that items such as itching, disturbance in familial activities, and time for sleep have more significant effects on QoL in female infants than male infants, while Ang in Singapore has reported more impairments in the familial activities of the male infants<sup>20,21</sup>. This discordance might be explained by cultural difference.

In our study, we observed, a strong and positive relationship between QoL score and severity of the disease based on SCORAD ( $P < 0.001$ ), that was compatible with other studies<sup>22-24</sup>.

Our results confirmed validity and reliability of Persian version of IDLQOL. Therefore, it can be used to evaluate QoL of infants in patients with atopic dermatitis. The limitation of our study was the absence of healthy infants as control group to compare the QoL of AD children with healthy ones.

**Conflict of interest:** None declared.

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