Research Paper
The Persian Version of Skindex-29 Health-related Quality of Life Index: Translation and Psychometric Validation

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ABSTRACT

Background: Dermatologic diseases have considerable effects on patients' health-related quality of life (HRQoL). The assessment of diseases' effects on patients' lives is an important component of disease management. Although Skindex-29 is one of the most utilized measures for assessing dermatology-specific HRQoL, there is no Persian version of it in Iran. This study aimed to translate Skindex-29 into Persian and assess its psychometric properties.

Methods: The study was a methodological study, carried out to examine the psychometric properties and factor structure of the Persian version of Skindex-29. The translation was conducted based on Mapi guidelines. In total, 200 dermatologic patients filled in the dermatology life quality index and the Persian version of Skindex-29. Internal consistency reliability was assessed using Cronbach alpha. Convergent validity and known-group validity were evaluated. Exploratory and confirmatory factor analyses were conducted to test construct validity.

Results: The final translated version was comprehensible and Cronbach alpha was 0.967. Skindex-29 total score and its subscales exhibited strong correlations with the dermatology life quality index. Known-group validity was supported by the difference between the mild and severe disease groups (P<0.05). Factor analyses identified three well-fitting factors like the original version, which accounted for 69.95% of the variance of the instrument.

Conclusion: This study developed an adequate Persian version of Skindex-29, which can be used as a valid and reliable HRQoL instrument to study Iranian dermatologic patients.

Keywords: Dermatologic, Health-related quality of life, Measurement, Psychometrics, Validation

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1. Introduction

However skin diseases are rarely life-threatening, they eventuate common health problems and lead to the most severe disease burden effects. The distress of symptoms, treatment, and social interactions affected by cutaneous diseases are in relation to psychological disorders in dermatologic patients. These psychological disorders almost remain underestimated; however, it is very clear that the quality of life of dermatologic patients is affected by skin diseases. The interrelationships between skin disease and the quality of life of dermatologic patients come from patients' appearance which alters their concerns, expectations, and goals and affects social interactions and emotional patterns. The intensity of these effects is relevant to patients' perception of their disease [1-3].

The patients' subjective understanding of the effects of their current health status on their level of overall functioning and general well-being represents an evaluation named health-related quality of life (HRQoL). HRQoL contains subjectivity and multidimensionality of emotional, social, and functional aspects [3, 4]. Such patient-oriented assessment is an essential outcome measure in addition to clinical factors to evaluate disease burden, monitor disease status, and understand the progression, and efficacy of therapeutic actions [2]. Studies have shown that the HRQoL of patients with a wide range of skin diseases such as psoriasis, acne vulgaris, atopic dermatitis, skin tumors, vitiligo, and skin ulcers reduced significantly [5-8]. Although studies show that up to a third of dermatologic patients suffer from psychopathology, especially anxiety and depression, most dermatologists ignore the role of these factors in the assessment and treatment of patients. HRQoL assessment through patient subjectivity is very crucial because it admits that physicians' judgments of disease severity and its consequences have not a consistent correlation with the patient's assessment. On the other hand, focusing on the clinical severity of the disease could not represent its effects on patients' lives [1, 5].

HRQoL is an important element in clinical investigation and intervention programs [9]. However, it is a challenging concern to measure the life quality of patients with a dermatologic disease because the high degree of involvement of patients with the disease is not visibly correlated with the extensive bothering and vice versa. On the other hand, there are very complex interrelationships between the skin and psychological conditions showing the need for psychometric measures to assess different effects of skin disease on patients [3, 10].

Several tools are being used for the evaluation of dermatologic patients' quality of life including the Dermatology Life Quality Index (DLQI) with 10 items, Skindex-16 (16 items), and Skindex-29 (29 items). DLQI is one of the initial valid instruments which evaluate six subscales of life quality with good psychometric properties; but, it is a very short form that cannot address all aspects of HRQoL such as emotional and mental health and it cannot incorporate different aspects regarding future health [11]. The last strivings for the development of exhaustive instruments resulted in Skindex-29 and Skindex-16. These are the most commonly used disease-specific instruments for investigating HRQoL of dermatologic patients which have been extensively studied and refined in different languages and population samples.

The Skindex has enough sensitivity among different clinical-assignment systems and can discern the least effects of disease on HRQoL [9-12]. Skindex-29, in comparison to Skindex-16, is more comprehensive being suitable for investigating and understanding a specific skin condition on HRQoL of patients. Also, it is well studied and used broadly among different skin diseases and different languages. It is a self-report measure that was originally developed in English by Chren et al. in 1997. The 29-item version is a refinement of the initially developed 61-question version which decreased respondent burden and improved evaluation and discrimination. Skindex-29 can be used for patients with all sorts of skin diseases. It taps into crucial factors in evaluating the quality of life including physical symptoms (10 items), emotions (7 items), and functions such as interpersonal interactions and daily activities (12 items) Skindex-29 takes an average of five-minute completion. Skindex-29 possesses high conceptual and psychometric properties and is suitable for studying patients' perceptions and comprehensive experiences of disease and treatment [12, 13].

Other versions of this instrument in different languages [9, 10, 14, 15] are already available. Due to Skindex-29 importance in the field of quality of life and the unavailability of the Persian version, this study intended to translate it into Persian and culturally adapt it. This study investigated if the Persian translation of the Skindex-29 has the same factorial structure as the original version. Furthermore, the assessment of the psychometric properties of this scale was carried out to examine if the data support the instrument's validity and reliability.

2. Methods

Study design

This study was a methodological one, carried out in two phases: the translation phase and the evaluation of psychometric properties.

Translation

To maintain the faithfulness of the translated version to its original one and to ensure cultural adaptation to the Persian population, the translation was done on basis of Mapi for the research trust standard process. Mapi is an organization for clinical outcome assessment and distribution of questionnaires for validation. The following steps were carried out as the translation method conformed to the guidelines for cross-cultural adaption of health-related quality of life measures [16]. In the first step, three bilingual native Persian-speaking translators independently translated Skindex-29 into Persian. Then, a unique translation by consensus was developed. Next, three other bilingual persons who had no access to the original version did the back translation and a unique back-translation consensus was developed. This back-translation was sent to Mapi for review. The Mapi checked if the translated items were conceptually equivalent to the original version and if translated version's linguistic criteria for acceptance were met. Then, the Persian version was tested on a pilot group of 15 persons with and 15 persons without skin disease to examine the comprehensibility of the translated version.

Evaluation of psychometric properties

Setting and participants

The participants included all dermatologic patients of Kerman's dermatology clinics. Two clinics in Kerman City, Iran, were selected by convenience sampling method. These two were the biggest dermatologic clinics and the final Persian version of Skindex-29 was self-administered by patients with skin diseases randomly selected from these clinics' outpatients. A systematic random sampling by recruiting every fourth patient based on their turns in visits was conducted and outpatients entered the study according to the inclusion criteria such as age (18 years or more), the ability to read and write, confirmed diagnosis of dermatological disease by a physician, the presence of symptoms for at least six months, having no neuro-psychiatric disorder, and signing an informed consent form of participation. The exclusion criteria were the refusal to participate in the study or signing the informed consent form.

Psychometric testing was done by a sample size based on the 5 participants for each item criterion [17], and based on the Hair guideline, a sample size of 200 participants was recruited [18]. Initial participants were 212, of which 12 patients cleared out more than 25% of the items of any instrument unanswered and were excluded from the assessment phase. Furthermore, the analysis of Skindex-29 was carried out on 200 patients.

Measures

Sociodemographic and clinical characteristics

Patients filled in items of age, gender, marital status, educational level, and employment status. Clinical information like diagnosis, duration of skin disease, classification of disease severity, and synchronization of another disease was collected from a medical record by a physician.

Dermatology Life Quality Index (DLQI)

DLQI is a 10-item brief HRQoL questionnaire developed by Finlay and Khan (1994). The index that examines the quality-of-life impact of skin disease was designed as a simple and practical instrument for routine clinical use applicable to patients with any skin disease [19]. The DLQI provides one total score and six subscale scores. These six perspectives of quality of life are symptoms and feelings, everyday activities, leisure, work and school, personal relationships, and treatment; higher scores reflect greater impairment and lower quality of life. Items should be answered on a 4-point Likert scale. It is highly recommended in several language versions that are frequently used in clinical studies [2, 20]. Cronbach α coefficient of the Persian version of DLQI was 0.77 with other approved psychometric properties [21, 22].

Skindex-29

This instrument was developed by Chren and colleagues in 1997 and contains 30 items with 18 items about side-effects of treatment that are not scored. The 29 items aimed at assessing HRQoL of patients with skin diseases have three subscales including burden of symptoms, social and physical functioning, and emotional responses. Each item is rated on a 5-point Likert scale and scores are calculated by averaging responses to items on a given scale with higher scale scores reflecting

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greater impairment. Cronbach α coefficient of internal consistency for reliability was 0.87, 0.94, and 0.96 for physical symptoms, emotions, and functioning, respectively. Pearson's r correlation coefficients for examining repeatability as the test-retest reliability was 0.91 for the physical symptoms subscale, 0.88 for the emotions subscale, and 0.92 for the functioning subscale. Also, the sensitivity of subscales to changes in the patient's clinical status and the relevance of the item contents have been confirmed [12, 13].

Data collection and ethical considerations

The study has been approved by the research ethics committee of Kerman University of Medical Sciences with code IR.KMU.REC.1401.050. Dermatologic outpatients of two dermatology clinics in Kerman were included in the study from July 2021 to October 2021. A short description of the research and its goal, participant's confidentiality, participant autonomy, and the right to withdraw from participating were explained to all participants and they voluntarily signed the informed consent form. It took approximately 10 minutes to fill in the questionnaires. Participants who were unable to read or write were helped by trained research assistants.

Data analysis

The statistical analyses were performed using SPSS software, version 22 (SPSS Inc., Chicago, IL, USA) and LISREL Version 8.5 (Scientific Software International, Chicago, IL, USA). Descriptive statistics were used to summarize the data. Cronbach alpha coefficient and the corrected item-total correlations were determined to assess internal consistency reliability. Furthermore, composite reliability (CR), average variance extracted (AVE), and results of the Kolmogorov-Smirnov normality test were evaluated. Known-group validity, i.e., the capacity of the Skindex-29 to discriminate different levels of patients' quality of life with different skin diseases severity was assessed using the Mann-Whitney U test comparing mean scores of total value and three subscales (emotions, symptoms, and functioning) between two groups of patients with low and severe skin disease rated by a physician. This study aimed to assess convergent validity, the extent to which Skindex-29 scores are associated with other already known and theoretically related instrument scores such as DLQI. To assess the convergent validity, the correlation between Skindex-29 and the DLQI scores was evaluated. Spearman's rank correlation coefficient was utilized to assess correlations between the Skindex-29 and the DLQI. All tests were performed at P=0.05 statistical significance level.

For evaluating construct validity, and if the underlying factor structure of the instrument in a new and different population is the same as the original instrument, and to discover the factor structure of the measure and to assess its internal reliability, we used exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). To ensure data adequacy for the factor analyses we used the Kaiser-Mayer-Olkin (KMO) test and Bartlett's test of sphericity. EFA was performed with the principal component method with varimax rotation and with the Kaiser normalization method. It applied to examine whether the factorial structure of the original English version can be reproduced for the Persian version of the Skindex-29. For defining a given factor, the items' factor loading needed to be upper than 0.4. We identified factors based on eigenvalues greater than 1.

CFA was moreover utilized to assess the adequacy of factor structure and the goodness of fit of the supposed three-domain structure of the instruments. The goodness of fit lists valued between 0 and 1 included goodness of fit index (GFI), adjusted goodness of fit index (AGFI), non- normed fit index (NNFI), comparative fit index (CFI), standardized root mean square residual (SRMR), and root-mean-square error of approximation (RMSEA). The primary four indices were anticipated to be bigger than 0.90, the SRMR was anticipated to be less than 0.08, and the RMSEA was anticipated to be less than 0.10 [23, 24]. Since item 18 in the original version of Skindex-29 was included just because the main author was interested in evaluating side effects and treatment which is apart from the quality of life and it is not part of the construction, we removed it from the analysis (there are 30 items, overall 29 items of construction, without item 18).

3. Results

Translation

In the final agreement of the first step translators developed the first Persian version of Skindex-29, then at the end of the second step, the backward translators' consent made the first English version which was sent to Mapi and asked for an evaluation. Reviewed by Mapi, there were no discrepancies between the original and back-translated versions. All the items were comprehensible and there were no inappropriate, dismissed, or modified questionnaire instructions and items. So, no change for the backward translation of the instrument was required. Then, the obtained Persian version of the questionnaire was administered to a pilot group of 15 patients and 15 nonpatients for testing the comprehensibility of the ques-

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Table 1. Demographic and clinical characteristics of the sample (N=200)

Characteristics		No. (%)
Gender	Female	157(78.5)
	Male	43(21.5)
Marital status	Married or living with a partner	97(48.5)
	Single	95(47.5)
	Separated, divorced, or widowed	8(4.0)
Other co-existing chronic diseases	Yes	35(17.5)
	No	165(82.5)
Dermatological diagnosis	Atopic dermatitis	3(1.5)
	Seborrheic dermatitis	2(1.0)
	Allergic contact dermatitis	33(16.5)
	Pruritus	7(3.5)
	Urticaria	6(3.0)
	Acne	88(44.0)
	Vitiligo	4(2.0)
	Other	5(2.5)
	Warts	11(5.5)
	Tinea versicolor	2(1.0)
	BCC	2(1.0)
	Alopecia areata	2(1.0)
	Psoriasis	8(4.0)
	Melasma	10(5.0)
	Freckle	17(8.5)
Employment	Employed	86(43.0)
	Not employed	114(57.0)
Education level	Less than high school	27(13.5)
	High school	80(40.0)
	College or higher	93(46.5)
Severity of disease	Mild	95(45.5)
	Severe	105(55.5)

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Table 2. Descriptive information and cronbach alpha of Persian version of Skindex-29

Variables	Score	Mean±SD	Percentile			Corrected Item-Total Correlation	Cronbach α	CR	AVE	z	P
			25	50	75						
Functioning	12	26.82±12.60	15.0	26	36	(0.950-0.954)	0.958	0.927	0.514	0.120	0.0001*
Emotions	10	25.91±12.26	15.0	25	34	(0.950-0.959)	0.957	0.920	0.540	0.101	0.0001*
Symptoms	7	17.10±8.20	10.0	16	24	(0.886-0.902)	0.910	0.910	0.592	0.112	0.0001*
Total	29	69.84±28.91	43.2	69	89	(0.965-0.968)	0.967	0.960	0.541	0.079	0.0001*

SD: standard deviation; CR: composite reliability; AVE: average variance extracted, * Two-tailed P<0.001.

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Table 3. Comparison of Skindex-29's scores in patients with severe and mild skin disease and Spearman's rank correlation coefficients between Skindex-29 and DLQI

Skindex-29	Skin Disease (Mean±SD)		Mann-Whitney U	Z	P	DLQI (Total Score)	Symptoms and Feelings	Daily Activities	Leisure	Work and School	Personal Relationship	Treatment
	Severe (n=109)	Mild (n=91)										
Functioning	31.25 ±13.45	23.13 ±10.57	3131.00	-4.494	0.0001	0.659	0.601	0.604	0.569	0.473	0.535	0.245
Emotions	30.80 ±12.34	21.83 ±10.65	2931.00	-4.984	0.0001	0.647	0.621	0.591	0.540	0.482	0.523	0.245
Symptoms	19.23 ±8.93	15.33 ±7.12	3718.00	-3.053	0.002	0.532	0.507	0.445	0.383	0.381	0.355	0.357
Total	81.29 (29.39)	60.28 (24.85)	2954.50	-4.920	0.000	0.719	0.675	0.647	0.595	0.530	0.564	0.307

DLQI: Dermatology Life Quality Index

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tionnaire. There were no issues with meaning, interpretation, and ambiguity, which made it possible to develop the ultimate Persian version of the Skindex-29.

Psychometric properties

Participants characteristics

According to Table 1, a total of 200 patients with the dermatologic disease were studied. The mean age of participants was 28.26±8.75 years, with a minimum age of 18 years and a maximum age of 49 years. Most of the participants were female (78.5%), 86.5% of patients had at least a high school education, 48.5% of participants were married, and 51.5 % were single. Among participants, 43% were currently employed. The most diagnosis was acne (88 patients). The mean duration of dermatologic disease was 5.3±4.2 years and 17.5% of patients suffered from other chronic diseases with the mean of 5.5 years. Table 1 summarized further information on the patients.

Response distribution and reliability

The means, standard deviations, percentiles, corrected item-total correlations, Cronbach alpha coefficients, composite reliability, average variance extracted, and results of the Kolmogorov-Smirnov normality test are presented in Table 2 for the Persian version of Skindex-29 and its subscales. The Cronbach alpha coefficients for the Persian version of Skindex-29 and its scales were very high (>0.90) and the item-total correlation ranged from 0.88 to 0.96, which signified very good internal consistency reliability of the Persian version of Skindex-29. The combined reliability (CR) scores were above 0.9, and, the calculation of average variance ex-

tracted (AVE) for each of the three factors was above 0.5. Considering that the CR was above 0.9 and the AVE values were higher than 0.05, the structural reliability of the scale was established. On the other hand, since CR>AVE, we expected convergent validity for the data, too. The results of the Kolmogorov-Smirnov normality test showed computed scores' distribution differed from the normal hypothesized distribution, P<0.05.

Known-group validity

Patients with significantly different levels of disease severity scored by the physician were compared to assess known group validity. Comparing patients of severe skin disease group with patients with mild disease group in the total score of Skindex-29 and its three factors showed significantly different among the two groups Mann-Whitney U test (z=-4.920, P<0.05) and represented that HRQoL decreased with the increasing severity of disease (Table 3).

Convergent validity

As shown in Table 3, a good positive correlation between the total score of Skindex-29 and its subscales and the total score of DLQI and its subscales (Skindex-29, r from 0.24 to 0.71) was demonstrated. It means Skindex-29 has convergent validity.

Construction validity

Exploratory factor analysis (EFA)

The obtained KMO fit index of 0.948 and Bartlett's test of sphericity (χ^2 = 5577.141, df = 406, P<0.001) showed that the sample size is satisfactory for factor analysis and confirmed good fitness of components of

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Table 4. Exploratory factor loadings of Skindex-29 items and goodness-of-fit indices of three-factor structure model for Skindex-29

Factor	Items	Factor Load	Communalities	Initial Eigenvalues	% of Variance	Cumulative %	Goodness-of-Fit Indices	
							Fitness Indices	Values
1	item11	0.822	0.812	15.616	53.847	53.847	Chi-Square/df	1041.11/374=2.78
	item14	0.771	0.717					
	item22	0.737	0.759				GFI	0.73
	item25	0.735	0.747					
	item29	0.735	0.640				AGFI	0.69
	item20	0.717	0.653					
	item17	0.712	0.697				RMR	0.13
	item2	0.693	0.675					
	item4	0.686	0.623				SRMR	0.065
	item8	0.664	0.618					
	item5	0.657	0.694				RMSEA	0.095
	item30	0.652	0.619					
2	item13	0.804	0.743	3.097	10.678	64.525	NFI	0.93
	item21	0.787	0.840					
	item15	0.780	0.831				CFI	0.98
	item12	0.780	0.778					
	item6	0.763	0.832				IFI	0.98
	item23	0.757	0.780					
	item3	0.740	0.678				RFI	0.91
	item9	0.707	0.701					
	item26	0.668	0.673				PNFI	0.86
	item28	0.508	0.563					
3	item7	0.877	0.797	1.573	5.424	69.949	PGFI	0.63
	item10	0.820	0.699					
	item1	0.791	0.726					
	item27	0.765	0.630					
	item16	0.723	0.581				NNFI	0.97
	item19	0.707	0.593					
	item24	0.687	0.587					

df: degrees of freedom; GFI: Goodness of fit; AGFI: Adjusted goodness of fit; RMR: Root mean square residual; SRMR: Standardized root mean square residual; RMSEA: Root mean square error of approximation; NFI: Normed fit index; CFI: Comparative fit index; IFI: Incremental fit index; RFI: Relative fit index; PNFI: Parsimony normed fit index; PGFI: Parsimony goodness of fit; NNFI: Non-normed fit index.

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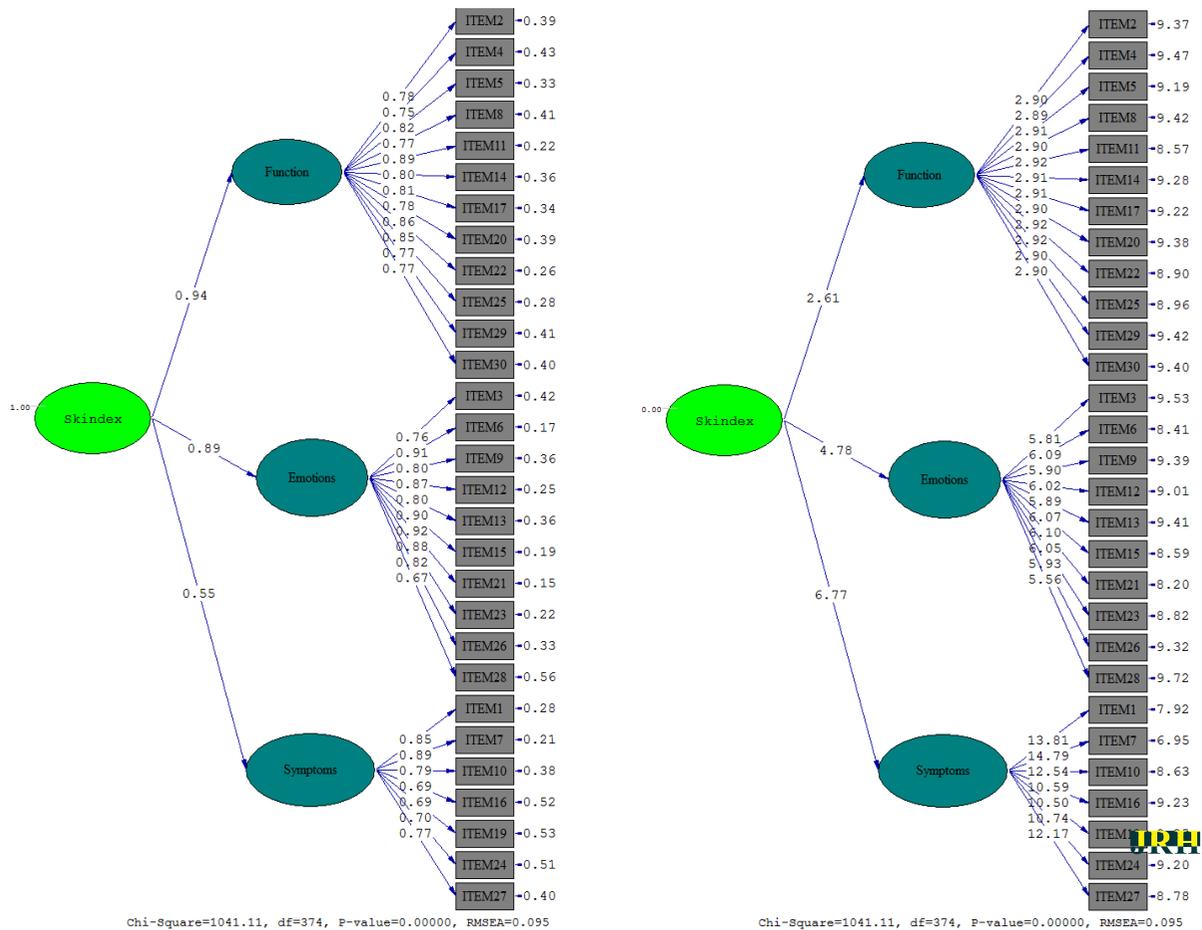
Figure 1. The path coefficients for the three-factor model for Skindex-29 obtained from CFA and the significant values for the three-factor model for Skindex-29 obtained from CFA

the original instrument in the translated tool. Each factor was labeled by the intensely loaded items. Eigenvalues greater than 1 for three factors of Skindex-29 were obtained. The total variance ratio explained by the sum of the three factors was 69.949%. The result of rotation by the varimax method showed that the factor loads of all items were higher than 0.5. Therefore, the extracted three factors matched almost the functioning (factor one), symptoms (factor two), and emotion (factor three) subscales the same as the original version. Table 4 shows the exploratory factors extracted from the Persian version of Skindex-29.

Confirmatory factor analysis (CFA)

To study the factor structure validity of the Persian version of Skindex-29 based on the factors extracted from the exploratory analysis, CFA was performed. For this purpose, the normality distribution for items was investigated using skewness and kurtosis. The results showed that the values of skewness and kurtosis were in the range -2 to 2 and the relative symmetry in the variables was set.

The first and second-order CFA with the maximum likelihood estimation method was done to evaluate the validity of three factors. A review of the model fit indices is given in Table 4. The fitted model can be considered suitable since the ratio of Chi-square to the degree of freedom was below 3 (Chi-Square/df: 1041.11/374=2.78) and CFI, IFI, RFI, and NFI indices were above 0.9. Also, PGFI, PNFI, and AGFI were large enough to meet the cut-off criterion of the goodness of fit indices (larger than 0.6). RMSEA index was also lower than 1 (0.095). The SRMR, which is regarded as the most important index, was less than 0.08 (0.065) which means satisfactory [23].

Figure 1 provides estimates of the standard coefficients and the significant values of the model, respectively. As can be seen from Figure 1, the standardized values of factor load in the first and the second order were above 0.4. On the other hand, the significant values of each communication path were higher than 1.96. So, the model fit was executable and the items were positioned correctly in each factor.

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4. Discussion

One of the most useful and practical instruments for assessing dermatologic patients' quality of life is Skindex-29. In Iran, there was no Persian version of Skindex-29 to date. The present study aimed to translate Skindex-29 into Persian based on accepted steps in the generation of linguistically and conceptually equivalent translations of quality-of-life measures. Furthermore, this study assessed the psychometric properties of the Persian version of Skindex-29. For this purpose, the questionnaire was translated. All items in the Persian version of Skindex-29 were understandable for different participants of different educational levels. There were no significant missing responses due to confusion about the meaning of items.

After translation and cultural adaptation, we conducted psychometric validation to assess if the present scale measures what it intends to measure. For this purpose, the internal reliability of Skindex-29 was evaluated based on the Cronbach alpha coefficient for three domains and a global scale. The Cronbach alpha was higher than 0.9, confirming good internal consistency higher than other studies [4, 9, 10, 14, 15]. High item-total correlations moreover authenticated the good homogeneity of the instruments.

We investigated the correlation of three subscales of Skindex-29 and its total score with the six subscales of DLQI and its total score. We choose DLQI as the measure for assessing convergent validity because Skindex-29 and DLQI are theoretically related. On the other hand, the DLQI is the most commonly used HRQoL questionnaire in dermatology with acceptable reliability and validity of the Persian version [21]. The values of correlation between Skindex-29 and DLQI subscale scores were significant, ($P<0.01$) demonstrating excellent evidence of convergent validity.

Results showed differences in three subscales and the total score of Skindex-29 among patients with different levels of disease severity. The quality of life measured by the Skindex-29 whole score and its three subscales was reduced by the enhanced degree of disease severity. It represents the adequacy of Skindex-29 to detect clinical differences among different groups of patients. This result was in line with other validation studies of Skindex-29, which like the original version, a good capacity to discriminate between different states of patients was shown [25-29].

The EFA provided three factors for Skindex-29. Furthermore, all items significantly correlated with the total scale score. The three factors extracted were consistent with the original and some other languages versions [13, 15] which means the three-factor model was confirmed by EFA. This model was supported with a CFA based on the excellent values of fit indices. Sample adequacy (employing KMO), appropriateness of the factor structure (with Bartlett's test of sphericity), eigenvalues higher than 1, high values of CFI, IFI, RFI, NFI, PGFI, PNFI, AGFI, and excellent values of RMSEA and SRMR represents the model's goodness of fit based on acceptable statistical standards [30]. These results were similar to the validation study of the Chinese version of Skindex-29 [15].

Overall, the psychometric properties of the resulting Persian version of Skindex-29 suggest that this is a valid and reliable measure to assess the effects of skin disorders on HRQoL in Persian-speaking patients with skin disease. In this study, different skin disease patients with various degrees of severity participated and a variety of skin conditions were studied. The assessment of patients was done by a dermatologist for establishing dermatological diagnoses and determining the severity of the disease. These two could be considered the strong points of our study. Nevertheless, this study has some limitations. The study sample was recruited at only two clinics, both located in the same city. So, it is hard to generalize our findings.

Due to the time-consuming filling of the questionnaire and to avoid patients' tiredness, test-retest reliability was not assessed. The third limitation was the lack of assessment of responsiveness, i.e., the capacity of the instrument to detect small but meaningful clinical changes over time. It was not possible to evaluate clinically significant changes for different diseases included in the present study within a reasonable time frame. It should be noted that because of cultural differences between the US and Iran, translated version of the original English version could have presented a response bias. Further research needs to study differential item functioning among patients with different cultural backgrounds. Additional studies would explore validation with different socio-cultural patients from multi-center clinics and different areas and measure test-retest reproducibility and responsiveness of the Persian Skindex-29.

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5. Conclusion

Our study demonstrated that the translated Persian version of Skindex-29 is a useful, valid and reliable instrument as an HRQoL questionnaire applicable for various types of dermatologic patients. It is expected to be used in clinical practice and clinical trials because it is self-administered, easily understood, and quickly answered. It would help physicians to focus on the HRQoL of dermatologic patients instead of only physical symptoms evaluation.

Ethical Considerations

Compliance with ethical guidelines

Participants were well informed about the aims and procedures of the study. The anonymity and confidentiality of the participants' data were confirmed and they signed an informed consent form. The Kerman University of Medical Sciences approved the story (Code: IR.KMU.REC.1401.50).

Funding

Authors' contributions

Conflict of interest

The authors declare no conflict of interest.

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