Translation and Psychometric Evaluation of the Persian Version of Lupus Erythematosus Quality of Life Questionnaire (LEQoL)

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Research

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Abstract

Background: Recently a comprehensive and multi-diversionary scale for assessing Quality of Life (QoL) in Patients with Lupus has been developed. This study aimed to evaluation psychometric properties of the Persian version of Lupus Erythematosus Quality of Life Questionnaire (LEQoL) in Iranian patients with Lupus Erythematosus.

Method: We used the forward-backward translation, and cognitive interview for linguistic translation. A cross-sectional design was utilized. We recruited a convenience sample of 165 lupus patients aged 19 years or over from the Iranian social media and Tehran city rheumatology clinics. Patients completed the 36-Item Short Form Survey (SF-36), The Symptom Checklist-90-R (SCL-90-R), and the translated LEQoL. The psychometric properties of the LEQoL were examined to establish test-retest reliability, internal consistency with Cronbach's alpha coefficient (COA), divergent-convergent validity, and construct validity. Also, we used Confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) for assessing factor structures.

Results: The total COA was α = 0.86. All subscales internal consistency ranging from 0.85–0.94. The findings of test-retest reliability for the overall scale was 0.93 and the subscales ranging between 0.82–0.92. The results from a CFA indicated that goodness-of-fit are satisfactory ($\chi 2/df = 1.28$, RMSEA = 0.042, CFI = 0.975). Also EFA showed that the Persian version of LEQoL with five-factor can explain 73.7% of the variances. For assessing validity, every factor of LEQoL has a correlation with some SF.36 and SCL-90-R subscales. This matrix indicates that the LEQoL subscales are somewhat independent, and this matter is one strength issue. Only depression (SCL-90 subscale) has a significant correlation with all LEQoL subscales.

Conclusion: The translated Persian version of the LEQoL is a suitable scale for assessing QoL in Iranian patients with lupus.

Introduction

One of the chronic, heterogeneous, inflammatory, and autoimmune disease with broad dimensions of symptoms is Lupus Erythematosus (LE)(1). LE characterized by immune dysregulation, production of autoantibodies, damages in various organs (e.g. Skin and the brain). LE divided in two main subsets: lupus erythematosus (SLE) and cutaneous lupus erythematosus (CLE) (2). The lupus erythematosus and cutaneous lupus erythematosus can occur co-morbid and separately(3). The prevalence of LE is at least five million worldwide, and the result showed that the prevalence of SLE in Iran is estimated at 40 per 100,000 Iranian(3). About gender differences, in every 10 LE patients, nine of them are female(4).

In chronic diseases context, one of the therapeutic aim is enhancing quality of life. As interventions for treating LE are in first steps, so one of the primary and important therapeutic aims for these patients is increasing their quality of life (5–7).The scientific literature showed that many psychiatric and neuropsychiatric symptoms can occur in LE patients. These symptoms include mood changes, chorea,

seizures, anxiety, suicide, sleep disturbance, cognitive dysfunction, and even psychotic (8–10). So, this disease has bio-psycho-social nature and patient's quality of life is multidimensional (e.g. emotional and physical). For assessing LE quality of life, there are some tools such as Lupus Quality of Life (Lupus QoL)(11), Systemic Lupus Erythematosus Quality of Life Questionnaire (L-QoL) (12), and Skindex to measure dermatology(13). These scales showed promising results in English patients and used widely. However, this scale has various and important limitation. First, these scales did not assess LE in general. In fact, they evaluate skin pathology, systemic lupus erythematosus, or other subsets instead of all domains. Second, as mentioned above QoL has various dimensions (emotional, physical, Cognition, Interpersonal, and Appearance), But, theses scales only evaluating one or two QoL-related dimensions(13). Finally, it is also suggested that a holistic point of view can describe patients in a comprehensive way and expand the clinician's attention regarding making treatments. (12, 13).

Recently, a Lupus Erythematosus Quality of Life Questionnaire (LEQoL) has been developed by Castellano-Rioja et.al (2020). This scale measures Lupus Erythematosus patient's Quality of Life in five subscale: Physical Factor, Appearance factor, Emotional factors, Cognition factor, and Relationship factor(14).

This scale tried to eliminate the limitations that exist in other similar scales. In fact, it is a multifactorial tool that examines the quality of life in a wide range of patients' problems. It also has a holistic view of the physical injuries and physical activities of patients. Finally, this tool is not only for SLE and is used for all LE patients. To be placed. Therefore, the aim of the present study was to investigate the psychometric properties of the Persian version of LEQoL in the Iranian population with SLE.

Materials And Methods

Study design

This Cross-sectional translation and psychometric evaluation of the Persian version of Lupus Erythematosus Quality of Life Questionnaire (LEQoL) was conducted in 2021 at the Department of Clinical psychology, Kermanshah University of Medical Sciences (KUMS). Permission was obtained from Giménez-Espert (corresponding author of the original version of scale).

Study population

A cross-sectional study was done with a convenience sample. Participants included 172 patients with LE from Iran. From these 172 patients, 165 patients met the inclusion criteria for the study: diagnosed as systemic or cutaneous/discoid lupus erythematosus, and motivated to take participating in research" were included. All 165 patients were over 18 years old and signed an informed consent form. The data collection process occurred in March to April 2021.

Linguistic validation

The linguistic validation of the LEQoL from Spanish to Persian consisted of three steps: a forward translation, a backward translation, and cognitive interviews. Two independent, bilingual Persian-native speakers with medical backgrounds (psychologists) translated the original Spanish version into Persian. A consensus version was developed by discussion and revision of the translated versions by the authors. Backward translation of the consensus version was performed independently by one Spanish native speaker without a psychological background, who was familiar with the culture of the Spanish and translated language. Adequacy of the translated version was proven by comparison of the original with the backward-translated versions. Next, the patient examination was conducted. The personal interviews were conducted during which the interviewer asked whether the participant had any trouble in understanding the LEQoL and checked the participant's interpretation of all items. Finally, proofreading was performed(15, 16).

Procedures

Initially a battery of tests including the Persian version of LEQoL, Symptom Checklist-90-R (SCL-90), and 36-Item Short Form Survey (SF-36). These tools were used to check validity.Then a Google Form containing all the mentioned questionnaires was created. Then a public announcement was spread to the Iranian population through the social networks Instagram and Telegram. Due to the low prevalence of LE, the notice asked individuals to call or send a message or send information or notifications if they have or know a person with lupus. The corresponding author of the article also referred to rheumatology clinics in Tehran (the capital of Iran, the most populous city in Iran) and asked clients to participate in this study. Finally, people with lupus were interviewed for 20 minutes. Regarding inclusion criteria, 165 people were included in the study. Then, the tools were provided to these people online and they were asked to send them to the researchers as soon as they completed them. The information will be collected confidentially and anonymously and the results will not be shared with others.

Instrument

Quality of Life of Patients with Lupus Erythematosus Instrument" (LEQoL): This scale consist of 21 items in five subscales: Physical Factor, Appearance factor, Emotional factors, Cognition factor, and Relationship factor. Results showed that original version of LEQoL has suitable psychometric properties(14). **The higher scores indicate higher impairments in patients with Lupus**. In this research we tried to assess psychometric properties of the Persian version of LEQoL.

Psychological symptoms: To evaluate the psychological symptoms of the patients, the SCL-90-R (Symptom Checklist-90-R) was utilized. The SCL-90-R evaluates the current level of the symptoms which occur during the last seven days. The aim of this scale is to carry out a brief evaluation of the type and severity of the patient's symptoms by self-assessment and has eight subscales, besides a total score (Sleeping Problems, Sensitivity, Anxiety, Depression, Obsessive-Compulsive, Somatization, Agoraphobia, and Hostility). We used the Persian manual for examining the SCL-90 data. Item scores range from zero (none) to four (severe). Cronbach's alpha's for the Iranian SCL-90 was 0.90(17).

General Quality of Life: For assessing the general quality of life in participants we used 36 Items Short Form Survey (SF-36). This scale consists of 36 items classified into eight subscales: role impairment due to physical health/role physical (4 items), mental health (5 items), energy and fatigue/vitality (4 questions), physical functioning (10 questions), social functioning (2 questions), general health (5 questions), body pain (2 items), and role impairment due to emotional health/role emotional (3 items). Two other general subscales are obtained by combining the subscales known as Mental Component Summary (MCS), and Physical Component Summary (PCS**). In this scale, high scores described as higher levels of QoL, and vice versa.** Psychometric researches showed that the Persian version of SF-36 has suitable validity and reliability in the Iranian population(18).

Statistical analysis

Data have been analyzed by SPSS V.25 and AMOS 26 software's. In order to analyze the data using descriptive statistics (mean, standard deviation, frequency and percentage) as well as Cronbach's alpha method to assess internal consistency, the correlation of LEQoL with SF-36 and SCL-90 were used to assess convergent validity. Also, test-retest reliability (from 25 participants) with two week was assessed by intraclass correlation coefficient (ICC). Confirmatory factor analysis (CFA) was used to examine the adequacy of the resulting factor model. To assess model fit, this research utilized a range of incremental and absolute model fit indices, including the ratio of chi-square to degrees of freedom (X2/df), root mean square error of approximation (RMSEA),comparative fit index (CFI), The goodness of fit index (GFI), and S-Bχ2 (df). Exploratory factor analysis (EFA) was applied to examine instrument dimensionality. Kaiser-Meyer Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity were analyzed first to determine the suitability of the data to undergo factor analysis.

Results

Sample characteristics

The Iranian patients with lupus diagnosis (n = 165) had a mean age of 40.49 ± 13 (range 19 to 65) years. Near eleven percent (n = 17) were male, and 71.5% (n = 118) had suffered systemic lupus. Table 1 showed a comprehensive picture about Participants' sociodemographic and clinical characteristics.

Table 1
Participants' sociodemographic and clinical characteristics (n = 165)

Variable		Mean ± SD / N (%)
Gender	Male	17 (10.3%)
	female	148(89.7%)
Education level	Under diploma	73(44.2%)
	Diploma	62(37.6%)
	University graduated	30(18.2%)
Age		40.49 ± 13
Lupus erythematosus type	Cutaneous	47(28.5%)
	Systemic	118(71.5%)
Time to diagnosis	Less than six months	25(15.2%)
	Six to twelve months	34(20.6%)
	More than one year	106(64.2%)
Marital status	Single	23(13.9%)
	Married	104(63%)
	In a relationship	9(5.5%)
	Other status/ prefer not to say	29(17.5%)

Internal Consistency

The Cronbach's α value for the Persian version of the LEQoL was measured at 0.862, which implies satisfactory internal consistency. Table 2 showed that all items if removed (except 18th item), lead to decrease the value of alpha, which means that items are appropriate. The various dimensions showed alpha values of between 0.85 and 0.94 (Physical Factor α = 0.88, Appearance factor α = 0.85, Emotional factors α = 0.93, Cognition factor α = 0.85, Relationship factor α = 0.94).

Table 2
Item-Total Statistics

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LEQoL1	91.5939	457.011	.586	.851
LEQoL2	91.6121	466.849	.507	.854
LEQoL3	91.9030	471.295	.428	.857
LEQoL4	91.6909	469.020	.451	.856
LEQoL5	91.8303	466.312	.440	.856
LEQoL6	91.6364	461.794	.538	.853
LEQoL7	91.3636	459.452	.438	.857
LEQoL8	91.3818	452.579	.539	.853
LEQoL9	91.4909	465.386	.453	.856
LEQoL10	91.5333	458.214	.504	.854
LEQoL11	91.7879	463.863	.432	.857
LEQoL12	91.3152	466.778	.416	.857
LEQoL13	91.2000	462.478	.474	.855
LEQoL14	91.3697	460.966	.529	.853
LEQoL15	91.2606	461.182	.502	.854
LEQoL16	91.6485	483.266	.256	.863
LEQoL17	91.6545	475.520	.374	.859
LEQoL18	91.7212	485.910	.257	.863
LEQoL19	91.8545	474.015	.404	.858
LEQoL20	91.8061	473.974	.410	.858
LEQoL21	91.7394	475.877	.395	.858

Test Retest Reliability

To test-retest reliability evaluation, the 30 patients were chosen by the computer version of the random number table. They completed the scale a second time two weeks after the baseline assessment without being presented the scale they had previously filled out. The test-retest reliability coefficient was found to be 0.964 for the whole scale (Lower Bound: 0.925, Upper Bound: 0.983) and this measure was significant

in 0.01 significance level (P < 0. 01).This measure indicate that this scale has strong test re-test reliability and is suitable for interventional studies.

Validity

In order to investigate the validity, the correlation between the LEQoL, SCL-90-R and SF-36were calculated. As shown in Table 3, some convergent-divergent correlations are significant at the 0.01 level. Therefore, LEQoL and its subscales have appropriate Validity levels.

Table 3. Pearson's coefficient correlations among variables

LEQoL Domains	LEQoL Appearance	LEQoL Emotional	LEQoL Cognition	LEQoL Relationship	SCL OCD	SCL interpersonal	SCL depression	SCL anxiety	SCL somatization	SCL hostility	SCL phobic	SCL paranoid	SCL psychoticism	SF. Physical	SF. Role	SF. EP	SF. Energy	SF. Emotional	SF. Social	SF. Pain	SF. General
physical	**0.3**	.18	0.14	**.21**	**.25**	**.23**	**.31**	**.31**	**.26**	.09	-.02	-.04	0.0	**-.19**	-.01	-.18	-.01	-.1	-.07	-.08	**-.25**
Appearance	1	**0.22**	0.185	0.17	0.166	0.165	**0.25**	**0.28**	**0.2**	0.18	-.02	0.2	-.01	-.03	**-.003**	-.19	**-.233**	-.07	-.179	0.54	**-.182**
Emotional		1	.1	**0.23**	0.13	0.16	**0.21**	**0.28**	0.004	0.155	-.04	0.0	.07	.07	.07	**-.30**	**-.32**	**0.41**	-.03	.05	**-.196**
Cognition			1	.08	.02	.06	.16	.05	.18	.18	.14	-.05	.07	**-.33**	.06	-.2	-.17	**-.202**	-.03	-.1	**-.229**
Relationship				1	**.21**	**.334**	**.26**	.15	.06	**.28**	-.03	-.06	.02	-.01	-.02	-.187	-.11	-.175	**-.27**	0.00	0.1

SCL: SCL-90-R, OCD: obsessive-compulsive disorder, interpersonal: interpersonal sensitivity, phobic phobic anxiety, physical: Physical functioning, Role: Role limitations due to physical health, EP: Role limitations due to emotional problems, Emotional: Emotional well-being, Social: Social functioning, General: General health

Bolded correlations indicate the correlation is significant at the 0.01 level (2-tailed).

Underlined correlations indicate the correlation is significant at the 0.05 level (2-tailed).

Exploratory Factor Analysis (EFA)

The responses of patients (165) were utilized for the evaluation of the EFA of CSS. KMO test showed strong sampling adequacy (0.828). Bartlett's Test was significant (chi-square value = 2175.647, P-value < 0.001) that explained the items are correlated and factor analysis can be fitted. Latent factors were achieved by the principal components analysis. The extracted factors were rotated with the varimax way. This criterion suggested the five-factor, which explained 73.7% of the variance (Table 4 & Fig. 1). The pattern matrix of extracted factors is shown in Table 5.

Table 4
Extracted principal components with Eigenvalues, Cumulative percentage of explained variance

Component	Initial solution		Rotated solution
	Cumulative % of variance explained	Eigenvalue	Cumulative % of variance explained
1	27.468	27.468	18.469
2	14.095	41.562	34.707
3	11.749	53.312	49.782
4	10.549	63.861	62.657
5	9.927	73.788	73.788

Table 4
Pattern matrix of scale

	Component				
	1	2	3	4	5
LEQoL1	.807				
LEQoL2	.786				
LEQoL3	.758				
LEQoL4	.768				
LEQoL5	.816				
LEQoL6	.766				
LEQoL7			.810		
LEQoL8			.781		
LEQoL9			.745		
LEQoL10			.744		
LEQoL11			.783		
LEQoL12		.913			
LEQoL13		.921			
LEQoL14		.899			
LEQoL15		.879			
LEQoL16					.889
LEQoL17					.876
LEQoL18					.842
LEQoL19				.927	
LEQoL20				.922	
LEQoL21				.941	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.					
a. Rotation converged in 5 iterations.					

Confirmatory factor analysis

To confirm the latent structure of CSS, the CFA was evaluated. The analysis was carried out on the whole sample (n = 160). Factor solution with two to five factors was modelled to check if the 5-factor is the best. Indicators of models were shown in Table 5. RMSEA and parsimony goodness of fit index (PGFI) for the 5-factor model are smaller than other models and CFI is larger. Also, the model has the best indexes that show the five-factor extracted model is the best representation of the structure of the data. Figure 2 showed the best model fit for five-factor solution.

Table 5
indicators to five-factor model about model fitness

No. of factors	χ2/df	CFI	Robust RMSEA (90% CI)	PGFI
5 factors	1.28	0.975	0.042 (0.024 0.057)	0.692

Discussion

The present paper aimed to translate and evaluate the psychometric properties of the Persian version of the LEQoL. As individuals with lupus are reportedly suffering from psychosocial and physical limitations due to their symptoms, it is important to adequately measure QoL to assess the effects of interventional researches. The present study found to support that a 21-item Persian version of LEQoL could be used to assess QoL in individuals who have lupus.

The procedure of forward-back translation was executed fluently in this investigation. Regarding the reliability of the scale, the total Cronbach's alpha coefficient had very well qualifies (α = 0.86), which was similar to the values in the original Spanish version (α = 0.92). All give subscales also had good and excellent internal consistency (ranging from 0.85–0.94, which was consistent with the original Spanish version (ranging from 0.82–0.92). Moreover, the findings of test-retest reliability for the overall scale (ICC = 0.93) and the five subscales (ranging between 0.82–0.92) indicated that the LEQoL possesses good stability over time, which was consistent with the original Spanish version.

In this research, the results from a CFA on data from 165 patients with lupus indicated that the psychometric properties of the LEQoL questionnaire are satisfactory. Specifically, most of the values used to evaluate the goodness-of-fit are satisfactory (χ2/df = 1.28, RMSEA = 0.042, CFI = 0.975). Also, for EFA results showed that for Persian version of LEQoL with five-factor can explain 73.7% of the variances which is almost equal with the original scale EFA with 75.3%.

Moreover, we used divergent-convergent correlations for assessing validity. We found that every factor of LEQoL has correlation with some SF.36 and SCL-90-R subscales. This matrix indicate that the LEQoL subscales are somewhat independent, and this matter is one strength issue. Only depression (SCL-90 subscale) has significant correlation with LEQoL subscales which means the common problem for every LEQoL factor is depression and clinicians must pay attention to this issue for all patients with lupus. This result is in accordance with pervious researches. The research literature showed that every reduction in

QoL has strong correlation with depression incidence. In fact, depression and QoL can affect each other(19–21).

Besides existing other scales for assessing QoL in patients with lupus, this scale is multi-diversionary, and brief. Brief scales with adequate subscales and self-referred nature are more suitable rather than comprehensive, difficult, and unclear scales(14, 22). In Iran, because of poor insurance procedures and lack of an adequate number of clinicians all around the country, brief and clear scales can help patients to use self-assessment. Also, these scales can help clinicians to obtain a comprehensive view of patients' quality of life in a short time.

The current research besides important strengths has a number of limitations. First, the study is limited by the prevalent limitations in psychological research, including using voluntary participation and self-report scales. Second, notwithstanding the sufficiency of the sample size, it may not nationally representative (Iran consists of various cultures and lifestyles). Third, for the validity assessment of the LEQoL, we used convergent and construct (only confirmatory factor analysis) validity. Totally, future researches can evaluate other types of construct validity such as predictive, and discriminant. Also, future research can develop family-reported and clinician-reported of this scale.

Conclusion

The translated Persian version of the LEQoL scale used in this research is a reliable and consistent tool that showed suitable internal consistency and validity. Clinicians can assess Qol in patients with lupus by this scale, and following patients' progress during treatment. Also, researchers can assess their intervention efficacy by using this scale. Finally, the patients and their families can use LEQoL as a self-reported measure for a better understanding of their disease.

Abbreviations

EFA: Exploratory factor analysis, CFA: Confirmatory factor analysis, GFI: Goodness-of-fit index, AGFI: Adjusted goodness of fit index, CFI: Comparative fit index RMSEA: Root mean square error of approximation SRMR: Standardized root mean square residual, QoL: Quality of Life, LEQoL: Lupus Erythematosus Quality of Life Questionnaire.

Declarations

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Competing interests:

The authors does not have any competing interests to declare.

Ethics approval and consent to participate:

All procedures used in collecting survey data on which this article relies on, are in accordance with the ethical standards of the Helsinki Declaration of 1964 and subsequent amendments or ethical standards. All data were collected anonymously, and no association could be established between the questionnaires and the responders.

Availability of data and materials:

Data are available upon reasonable request from the researchers.

Contributions:

M.D and S.M.A (Majid) have made substantial contributions to conception and design. S.R and Z.R collecting date. S.M.A (Mojtaba) analyzing data and drafting result subsection. All author take participate in Drafting the manuscript. Then, First author and corresponding author revised and submitted manuscript.

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Figures

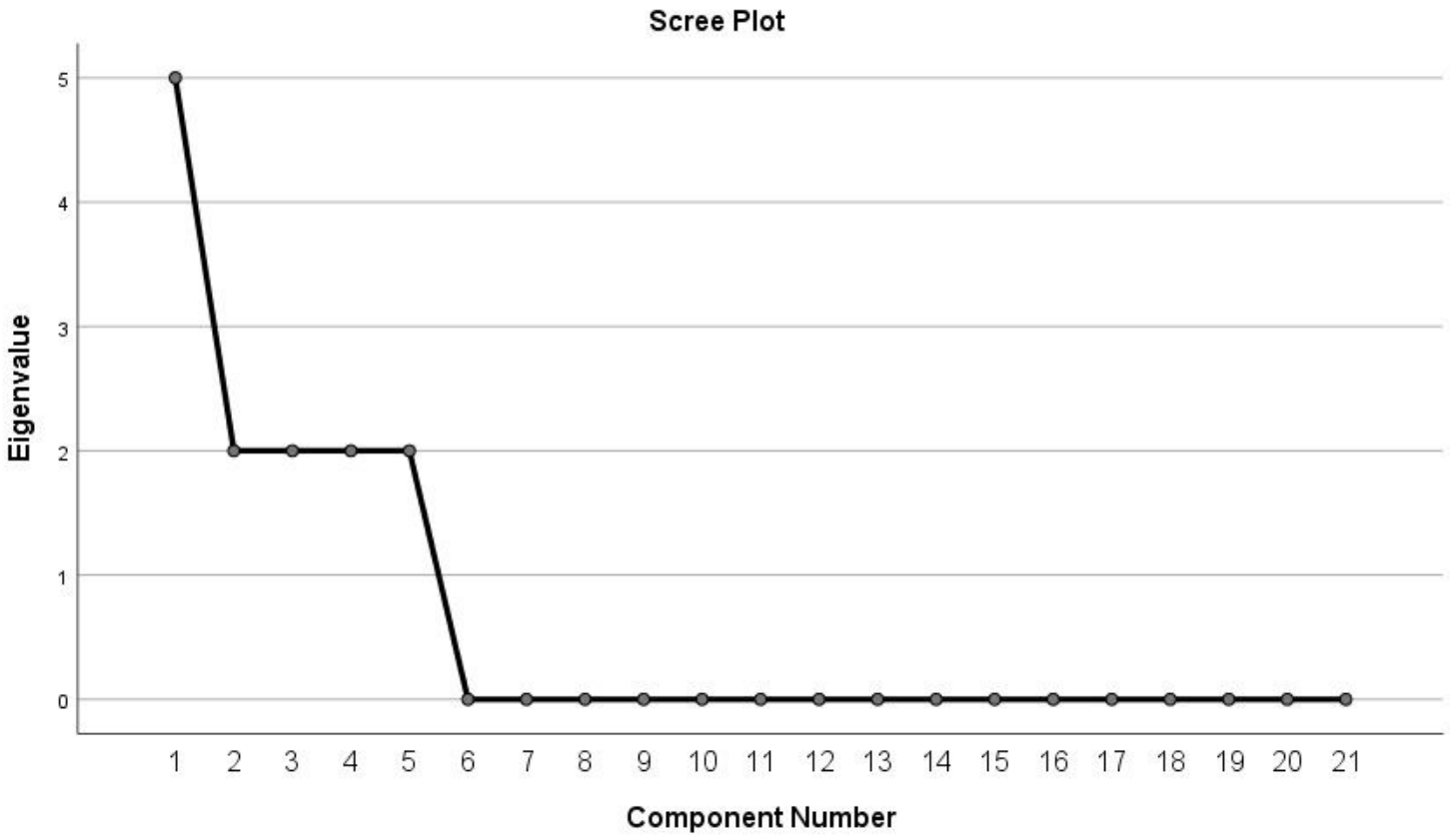

Figure 1

scree plot to five factors extracted by EFA with eigenvalues larger than 1

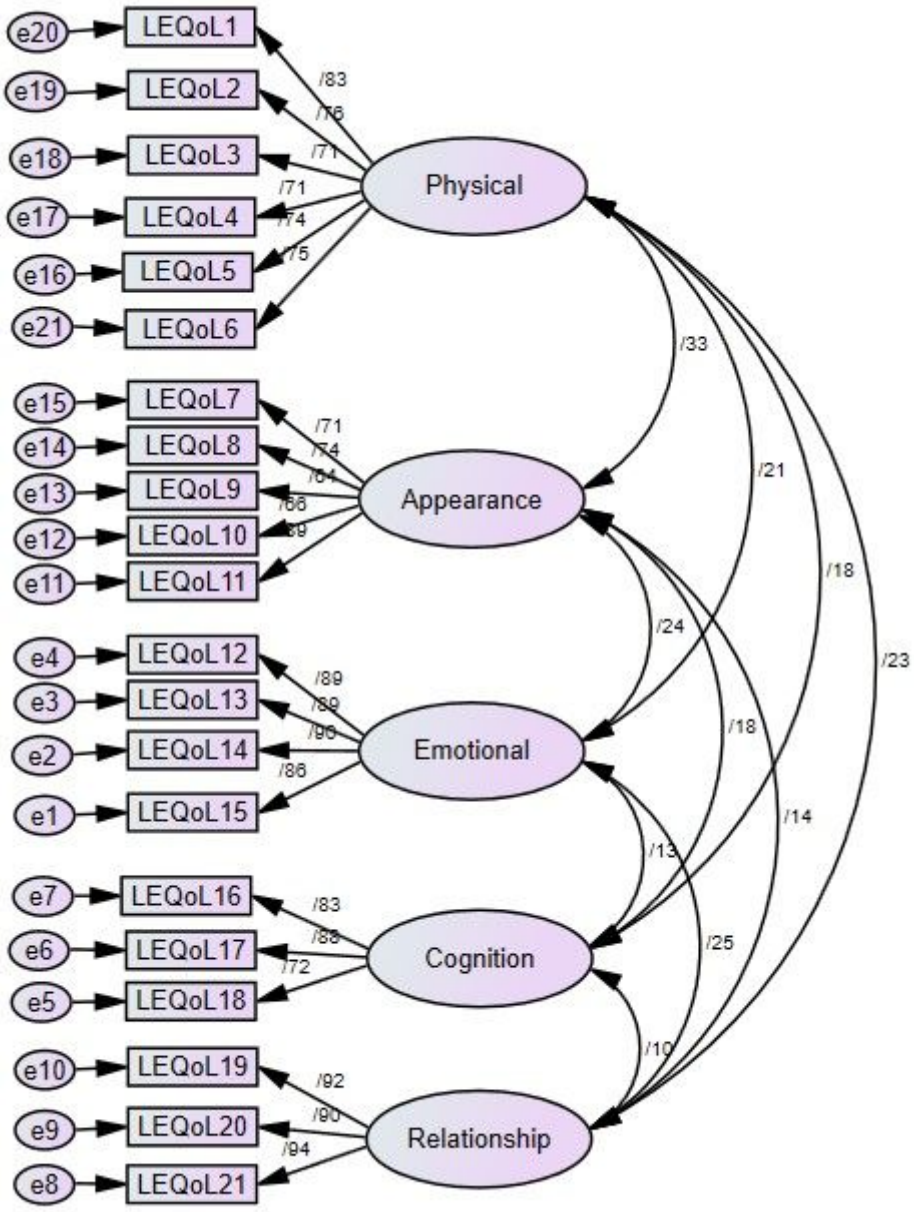

Figure 2

The best model fit for five-factor solution, the standardized parameter estimate