

## Original Article

# Validity and Reliability of the Health Related Quality of Life Questionnaire (Kidscreen-52) In a Sample of Iranian Students

Amir Nik-Azin<sup>\*1</sup>, Mohammad Reza Naenian<sup>2</sup>, Mohammad Reza Shairi<sup>3</sup>

<sup>1</sup> Department of Clinical Psychology, Shahed University, Tehran, Iran.

<sup>2</sup> Department of Clinical Psychology, Shahed University, Tehran, Iran.

<sup>3</sup> Department of Clinical Psychology, Shahed University, Tehran, Iran.

Received: 2014/7/11

Accepted: 2014/11/8

---

### Abstract

**Introduction:** The purpose of the present study was to examine the validity and reliability of the Health Related Quality of Life Questionnaire (KIDSCREEN-52) in a sample of Iranian students.

**Materials and Methods:** Using Multistage Sampling, 551 students from middle and high school, studying in Yazd city were selected as a sample. In this study "KIDSCREEN-52 HRQOL questionnaire", and some other questionnaires that assess similar construct were employed. To examine the validity of the questionnaire, construct validity (confirmatory factor analysis and diagnosis validity) and convergent validity were used; and Cronbach Alfa coefficient and test-retest reliability were also used to examine the reliability of the scale.

**Results:** Confirmatory factor analysis indicated that the root mean square error of approximation (RMSEA) and comparative fit index (CFI) values were 0.053 and 0.97 respectively, showing an excellent (adequate) fitness between the specified model and the observed data. However, the obtained convergent validity indicated that the relationship among KIDSCREEN-52 dimensions with other similar constructs, except for social acceptance and bullying, were moderate to high and significant. Differences in KIDSCREEN-52 dimensions were also found based on mental health and socio-economic status. All Alfa coefficients (except for social acceptance and bullying) and test-retest reliability coefficient (two week distance) were acceptable.

**Conclusion:** The KIDSCREEN-52 questionnaire has a good validity and reliability in Iranian student population.

**Key words:** quality of life, health related quality of life, Kidscreen-52, validity, reliability, health policy

---

\* Corresponding Author: Tel: 09133569362, Email: anikazin@yahoo.com

## Introduction

Health Related Quality of Life (HRQOL) concerns physical, psychological, and social aspects of health and is influenced by individual personal experiences, beliefs, expectations, and feelings<sup>[1]</sup>. In the years 1980-1995, there has been a marked increase in obesity, asthma, and attention deficit – hyperactivity disorder. This shift in the range of health issues towards chronic diseases and behavioral disorders calls for some more attention to health-related quality of life, especially mental health of children and adolescents<sup>[2]</sup>.

There are too many measures used for the assessment of child general health-related quality of life including Child Health Questionnaire (CHQ)<sup>[3]</sup>, Child Health and Illness Profile (CHIP)<sup>[4]</sup>, Munich Quality of Life Questionnaire for Children (KINDL)<sup>[5]</sup>, Pediatric QOL Inventory (PedsQOL)<sup>[6]</sup>, Youth Quality of Life-Research Form (YQOL-R)<sup>[7]</sup>, and KIDSCREEN health-related quality of life group instruments. These instruments were made using the European Project “Screening and Promotion of Health-Related Quality of Life in Children and Adolescents” in which 22296 children from 13 European countries were subject to study. These self-assessment instruments which are accommodated with proxy scales for parents or other caretakers are applicable to healthy and chronically ill children and youths of 8 to 18 year old and can be used in hospitals, medical centers, and schools.

Presently, there are three forms of such instruments available with 52<sup>[8]</sup>, 27<sup>[9]</sup>, and 10<sup>[10]</sup> questions. The KIDSCREEN-52 comprises 10 dimensions (domains): Physical Wellbeing (Physical Well-Being explores the level of the child’s/adolescent’s physical activity, energy and fitness), Psychological Wellbeing (examines the psychological well-being of the child/adolescent, including positive emotions and satisfaction with life), Moods and Emotions (covers the experience of depressive moods and emotions, and stressful feelings), Self-Perception (explores whether respondents perceive their bodily appearance positively or negatively and body image is explored in questions dealing with satisfaction with looks as well as with clothes and other personal accessories), Autonomy (looks at the respondents’ opportunities to shape their social and leisure time), Relations with parents and Home Life (examines the child’s relationship with his or her parents and the atmosphere at home), Social Support and Peers (examines the nature of the respondents’ relationships with other children/adolescents), School Environment (explores the child’s/adolescent’s perceptions of his/her cognitive capacity, learning and concentration, and his/ her feelings about school), Social Acceptance and Bullying (covers the aspect of feeling rejected by peers at school), and Financial Resources (assesses the respondents’ perceptions of their financial

resources). Psychometric properties of this questionnaire have been examined in the studies conducted in different countries, including thirteen European countries [2], Spain [11], South Korea [12], Norway [13] and Argentina [14]. Internal consistency for 10 dimensions of KIDSCREEN-52 reported between 0.77 to 0.89 [2] and 0.77 to 0.95 [12]. Also convergent validity of KIDSCREEN-52 with Munich Quality of Life Questionnaire for Children (KINDL) [5] and Pediatric QOL Inventory (PedsQOL) were acceptable [2, 12]. Cross-cultural adaptation, semantic equivalence, and 10-dimension construct of the questionnaire were evaluated in various countries [13, 14]. This results show that the KIDSCREEN-52 is a cross-cultural questionnaire with acceptable psychometric properties.

There are a few questionnaires to evaluate Iranian youth quality of life and well-being. Recently Persian versions have been appeared for Personal Wellbeing Index-School Children (PWI-SC) [15] and Paediatric Quality of Life Inventory (PedsQL) with acceptable psychometric properties in Iranian adolescents [15-17]. Advantages of the KIDSCREEN instruments are mentioned as their cross-cultural adaption, available psychometric properties for the three present forms in several countries, different translations and multidimensional structures of the instruments. However to provide researchers with more elaborated tools in this field based on cultural, social and

economic parameters to support local and national projects, warrants the conductance of present research. Therefore, the current study is chiefly concerned with the question as whether the KIDSCREEN-52 will meet a desirable validity and reliability in a sample of Iranian youth or not.

## Materials and Methods

### Subjects and settings

First, the total number of students at middle- and high schools of Yazd per gender (23395 male and 24020 female students) and per district (22492 students in District 1 and 24923 students in District 2) in the school year of 2010-2011 was obtained. Next, using multi-stage sampling method, the required number of sample per gender, per school (Middle or High school) and finally per grade level in each district was selected. Final sample came to 551 students (276 male and 275 female), where 288 middle school students were within the age range of 11-15 years and 263 high school students were within the age range of 16-19 years. Mean (standard deviation) age for middle school students was 13.25 (1.03) and for high school was 16.49 (1.13).

### Measures

The health-related quality of life questionnaire KIDSCREEN-52 Self-report version<sup>[8]</sup>. The KIDSCREEN-52 questionnaire is based on a multidimensional HRQOL construct

and assesses several aspects of children's and adolescents' health and well-being. The instrument includes 52 items, which were rated by each individual on a five-point Likert scale. The scale indicates either the frequency of certain behaviors or feelings (1=never, 2=seldom, 3=sometimes, 4=often, 5=always) or the intensity of an attitude (1=not at all, 2=slightly, 3=moderately, 4=very, 5=extremely). The time frame refers to the previous week. The 52 items are distributed into the following 10 aspects or dimensions: physical well-being (five items), psychological wellbeing (six items), moods and emotions (seven items), self-perception (five items), autonomy (five items), parent relation and home life (six items), social support and peers (six items), school environment (six items), social acceptance/bullying (three items), and financial resources (three items).

Paediatric Quality of Life Inventory (PedsQL) Version 4.0 Generic Core Scales of The Self-Report Form<sup>[6]</sup>: The 23-question General Health-Related Quality of Life questionnaire for age group of 8 to 18 years old, covers the domains of physical function, emotional function, social function and school function. The responses to the multi-choice questions in Likert Scale range from 0 = never to 4 = almost always). The scores are later converted into 0-100 score scale (i.e. 0 = 100; 1 = 75; 2 = 50; and 4 = 0). To obtain the total score, like the scale scores, total scores of all questions are divided by number of

the answered questions. Validity and reliability of this measure has been confirmed in different researches<sup>[18]</sup> also in Iranian population<sup>[16, 17]</sup>.

The General Health Questionnaire (GHQ-28)<sup>[19]</sup>: present study utilizes the 28-question version of the questionnaire which includes 4 sub-scales of Somatic symptoms, Anxiety, Depression and Social Dysfunction and all the 4 sub-scales contain 7 questions. Validity and reliability of this instrument in different studies on children and adolescents have been investigated<sup>[20]</sup>.

Personal Well-Being Index – School Children (PWI-SC)<sup>[21]</sup>: This instrument is specifically applied children and adolescents (12 to 18 years old) and includes 7 items of satisfaction each of which concerns a domain of quality of life, plus an extra question which assesses quality of life in general. The questions are scored in Likert Scale ranging from 0 to 10.

Multidimensional Students' Life Satisfaction Scale (MSLSS)<sup>[22]</sup>: This scale is a self-report instrument with 40 multiple-choice questions in Likert Scale. This questionnaire can be applied both on groups and individuals to assess the dimensions such as: Family (7 questions), Friends (9 questions), School (8 questions), Self (7 questions), and Living Environment (9 questions) and to calculate the perceived quality of life general assessment using the combination of all choices with each other. This scale is designed for the age group of 8 to 18 years old,

the validity and reliability of which have been investigated inside and outside Iran<sup>[23, 24]</sup>.

Coopersmith Self Esteem Inventory (CSEI)<sup>[25]</sup>: This test contains 58 questions, 8 items of which are the lie detectors and the other 50 items are specified for Personal, Social, Academic, and Family sub-scales. The points in the questionnaire are recorded as 0 and 1. The scores range from 0 to 50. Earlier studies (over 300 studies) on the questionnaire's psychometric features – School Form - confirm its validity and reliability<sup>[26]</sup>.

The Strengths and Difficulties Questionnaire (SDQ) for children and the youth<sup>[27]</sup>: This questionnaire is a brief behavioral screening questionnaire aimed at 3- to 16-year-olds, which asks about children's and teenagers' symptoms and positive attitudes. Responses for items are summed to generate a total difficulties score and the examinee's status in three areas of normal (0 to 15), borderline (16 to 19), and abnormal (20 to 40) is specified. Validity and reliability of this instrument are acceptable<sup>[27]</sup>. In the present study, the questionnaire's total score is used to assess discriminate validity of KIDSCREEN -10 Index. It is assumed that the children and the youth classified as abnormal children in the SDQ relative to normal children and adolescents will score lower in KIDSCREEN-10 Index<sup>[10]</sup>.

Socio-Economic Status Inventory<sup>[28]</sup>: This questionnaire covers four domains of Education and Occupation of Head of the Family husbands

and Spouse, Household Expenses and Income, Housing and Facilities, and Leisure Time (one question for each dimension). To divide people into two groups of high and low socio-economic status, the 10 and 90 percentage points of the inventory were calculated and the people who were positioned below 10- percentage point were considered of low socio-economic status and those above 90- percentage point of high socio-economic status. The children and adolescents at low socio-economic status were expected to score lower in KIDSCREEN-10 Index<sup>[10]</sup>.

### **Translation and pilot study**

A research Collaboration Form was sent to the KIDSCREEN group to receive the Persian Form of the KIDSCREEN Index. Comparisons done between the original form of the scale with the version had been translated by the authors and the necessary changes were made accordingly. Initially, the scale was performed on 30 male middle- and high school students who had been selected using convenience sampling method. Next, based on the scale instructions, a cognitive interview was conducted with one student from each grade. At this stage, using General Probing Method the examinees were asked "if the questions were generally intelligible and clear", and "whether they were difficult to answer or not?" In addition, using Think Loud method, the questions were read for the examinee one by one and then immediately the examinee was asked to

recite the question using one's own words. This technique allows the researcher to make sure that the examinees have understood the questions and have correctly interpreted them. Finally, the examinees were asked to specify the words they didn't understand the meaning of. Results of this preliminary study indicated that the middle school students (11 years old and below) have difficulty in understanding some of the questions. Therefore, the scale was not administered on children below 11 years old (primary school students). Finally, in order to avoid respondent fatigue in the process of study, the KIDSCREEN-10 was administered for the entire sample along with one more and different questionnaire (included in the research tools).

### Statistical analysis

Using Cronbach's alpha and test-retest reliability (with two weeks interval), internal consistency of the KIDSCREEN-10 was investigated. An alpha coefficient of 0.70 and higher was considered acceptable <sup>[29]</sup>, and a coefficient of 0.6 or higher was considered as an evidence for adequate test-retest stability <sup>[30]</sup>. To verify the validity, construct validity assessment methods (Confirmatory Factor Analysis and Discriminate Validity) and Convergent-divergent Validity method were employed. To examine the model's Global Goodness of Fit Index (GFI), chi-square fit index ( $\chi^2$ ), ratio of chi-square to degrees of freedom ( $\chi^2/df$ ), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit

Index (CFI) <sup>[31]</sup>, and Root Mean Square Error of Approximation (RMSEA) <sup>[32]</sup> were applied. A ratio of chi-square to degrees of freedom ( $\chi^2/df$ ) smaller than 3, a GFI above 0.80-0.90, AGFI greater than 0.80, a CFI greater than 0.90-0.95, and a RMSEA between 0.05 and 0.08 indicates an acceptable fit, between 0.08 and 0.1 represents a moderate fit, and greater than 0.1 signifies a poor fit <sup>[33, 34]</sup>. To examine the convergent validity, Pearson correlation analysis was performed. The correlations were classified as low and weak (0.10 to 0.29), moderate (0.30 to 0.49), and high and strong (greater than 0.50). Finally, multi variant analyze of variance (MANOVA) were performed to compare the groups based on socio-economic status and to compare them in terms of psychological (mental) status, respectively.

## Results

### Descriptive and reliability results

The examinees with 20 percent missing answers of all questions of the KIDSCREEN-52 were to be excluded from the analysis. However, according to calculation of the data on missing answers, none of the examinees had to be kept out of the analysis. The range of missing answers to each question of the KIDSCREEN-52 varied from 18 to 21 percent. According to the results of table 1, dimensions of social acceptance and bullying and social support and peers have the greatest and smallest means, respectively. In addition, the results indicate a

floor effect for dimensions of psychological wellbeing, autonomy, parent relation and home life, social support and peers, social acceptance and bullying, and financial resources, and a ceiling effect for all dimensions. Further, Cronbach's alphas for all subscales are between 0.65 and 0.89, of which the subscales parent relation and home life and social acceptance and bullying have the greatest and the smallest alphas, respectively. Nevertheless, all alphas

(except for social acceptance and bullying) are greater than the recommended level of 0.70 and thus acceptable. An inter-item correlation of 0.39 was also found for social acceptance and bullying subscale which is acceptable. Moreover, the test-retest coefficients (with two-weeks interval) for all subscales are between 0.58 and 0.85, all of which are strong and significant ( $p < 0.01$ ).

**Table 1- descriptive statistics and reliability for the KIDSCREEN-52 dimensions**

variable	Mean	SD	Skewness	Kurtosis	%ceiling	% floor	Cronb. alpha	Test retest
Physical well-being	65.83	19.27	-0.22	-0.71	0	2.50	0.73	0.75
Psychological-well being	68.33	21.47	-0.49	-0.46	0.40	5.30	0.86	0.59
Mood & emotions	61.89	21.53	-0.24	-0.50	0	4.70	0.86	0.68
Self-perception	71.14	20.50	-0.57	-0.32	0	8.50	0.71	0.85
Autonomy	59.23	20.49	-0.09	-0.27	0.50	2.90	0.76	0.81
Parent relation & home life	68	23.77	-0.61	-0.35	0.50	9.10	0.89	0.78
Social support & peers	54.54	20.52	-0.01	0.02	0.90	2	0.88	0.65
School environment	62.29	18.49	-0.08	-0.44	0	1.30	0.80	0.85
Social acceptance & bullying	82.51	18.40	-1.09	0.91	0.20	34.80	0.75	0.79
Financial resources	64.44	27.05	-0.52	-0.52	2.90	14.90	0.66	0.71

## Validity

Obtained  $\chi^2$  value through factor analysis was 3145.56 ( $p < 0.01$ ); it means the ratio of  $\chi^2$  to df is 2.43, which falls within the acceptable range. Goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and comparative fitness index (CFI) were 0.82, 0.80 and 0.97, respectively, all of which are within the acceptable range. Finally, root mean square error of approximation (RMSEA) was 0.05, suggesting the model's acceptable fit.

A moderate to strong, positive and significant correlation were found among the dimensions of Pediatric Quality of Life Inventory (PedsQL) Version 4.0 with the assumed corresponding dimensions in KIDSCREE-52. In addition, negative and significant correlations among the dimensions of the General Health Questionnaire (GHQ-28) with the assumed corresponding dimensions in KIDSCREEN-52 varied from weak (for dimension of social support and peers) to strong (for the two dimensions of psychological wellbeing and mood and emotions). Positive and significant correlations

among the dimensions of Multidimensional Student Life Satisfaction Scale (MSLSS) with assumed corresponding dimensions in KIDSCREEN-52 were within weak (for dimension of self-perception) and strong (for dimension of family). Correlation coefficient among all subscales of KIDSCREEN-52 and Personal Wellbeing Index – School Children (PWI-SC) varied within weak (for dimension of social acceptance) to strong (for dimension of psychological wellbeing), indicating an overall positive and significant relationship ( $p < 0.005$ ,  $P < 0.001$ ). Finally, from moderate to strong, positive and significant relationships were found among Coopersmith Self Esteem Inventory (CSEI) and all the assumed corresponding KIDSCREEN-52 dimensions (except for social acceptance and bullying and social support and peers). Contrary to the assumption made, the relationship among the dimensions of social self esteem and the KIDSCREEN-52 dimensions of social acceptance and bullying and social support and peers were not significant (table 2).

The interaction among the KIDSCREEN 52 dimensions with socioeconomic status and mental health were significant separately ((Roy's largest root=0.34,  $F(10, 112)=3.84, p<0.01$ );

(Roy's largest root=0.35,  $F(10, 104)=2.89, p<0.01$ )).

Obtained results from the univariate analysis of variance (ANOVA) indicated (table 3) a significant difference between students of high- and low socioeconomic status in subscales of physical wellbeing, parent relation and home life, and financial resources ( $p < 0.01$ ) and subscale psychological wellbeing ( $p < 0.05$ ). Comparison of means signified a higher mean score for the group with higher socioeconomic status in the mentioned subscales. In addition, based on the Strengths and Difficulties Questionnaire (SDQ), there is a significant difference among students (normal, borderline, and abnormal) in subscales of psychological wellbeing, mood and emotions, self-perception, parent relation and home life, and social acceptance and bullying ( $p < 0.01$ ). The results of Scheffe post hoc test revealed significant difference between normal and abnormal groups in subscales of psychological wellbeing ( $p < 0.05$ ); between normal and borderline groups in subscale of parent relation and home life ( $p < 0.05$ ); and in subscale of social acceptance and bullying, between normal and abnormal groups on the one hand, and between borderline and abnormal groups on the other hand ( $p < 0.01$ ).

**Table 2- convergent and divergent validity of the KIDSCREEN-52**

variable		N	Kidscreen-52 (correlation coefficient)									
			Physical well-being	Psychological well-being	Mood & emotions	Self-perception	Autonomy	Parent relation & home life	Social support & peers	School environment	Social acceptance & bullying	Financial resources
PedsQOL	Physical function	88	0.45	0.32	0.49	0.42	0.41	0.36	0.07 <sup>NS</sup>	0.31	0.33	0.14 <sup>NS</sup>
	Emotional function	88	0.38	0.42	0.67	0.50	0.22*	0.55	0.09 <sup>NS</sup>	0.29	0.35	0.24*
	Social function	88	0.45	0.33	0.43	0.43	0.33	0.18 <sup>NS</sup>	0.14 <sup>NS</sup>	0.23*	0.30	0.12 <sup>NS</sup>
	School function	88	0.39	0.34	0.56	0.36	0.28	0.43	0.07 <sup>NS</sup>	0.42	0.20 <sup>NS</sup>	0.18 <sup>NS</sup>
	PedsQOL total score	88	0.53	0.46	0.71	0.56	0.39	0.50	0.11 <sup>NS</sup>	0.40	0.38	0.22*
GHQ-28	Somatic symptoms	88	-0.41	-0.48	-0.47	-0.37	-0.32	-0.40	-0.27	-0.27	-0.33	-0.18
	Anxiety & insomnia	88	-0.37	-0.53	-0.57	-0.47	-0.26	-0.51	-0.28	-0.23	-0.25*	-0.18
	Depression	88	-0.40	-0.60	-0.60	-0.54	-0.34	-0.45	0.21*	-0.27	-0.35	-0.28
	Social dysfunction	88	-0.42	-0.46	-0.42	-0.35	-0.38	-0.44	-0.28	-0.35	-0.24*	-0.25*
MSLS	Family	93	0.36	0.51	0.50	0.41	0.29	0.61	0.31	0.39	-0.04 <sup>NS</sup>	0.33
	Friends	93	0.31	0.15 <sup>NS</sup>	0.17 <sup>NS</sup>	0.38	0.24*	0.21*	0.41	0.27	0.18 <sup>NS</sup>	0.19 <sup>NS</sup>
	School	93	0.32	0.35	0.31	0.41	0.27	0.46	0.38	0.58	0.16 <sup>NS</sup>	0.22*
	Self	93	0.45	0.39	0.42	0.53	0.52	0.47	0.45	0.32	0.17 <sup>NS</sup>	0.36
	Living environment	93	0.35	0.35	0.32	0.25	0.37	0.14 <sup>NS</sup>	0.37	0.27	0.04 <sup>NS</sup>	0.20*
	Perceived QOL	93	0.52	0.52	0.51	0.58	0.50	0.56	0.56	0.54	0.15 <sup>NS</sup>	0.38
SEI-58	Personal	89	0.15 <sup>NS</sup>	0.39	0.53	0.41	0.25*	0.32	0.04 <sup>NS</sup>	0.17 <sup>NS</sup>	0.18 <sup>NS</sup>	0.23*
	Social	89	0.31	0.42	0.47	0.42	0.30	0.27	0.13 <sup>NS</sup>	0.17 <sup>NS</sup>	0.21 <sup>NS</sup>	0.20 <sup>NS</sup>
	Academic	89	0.25	0.41	0.41	0.50	0.21 <sup>NS</sup>	0.34	0.05 <sup>NS</sup>	0.58	-0.07 <sup>NS</sup>	0.33
	Family	89	0.33	0.52	0.53	0.50	0.24*	0.77	0.05 <sup>NS</sup>	0.37	0.03 <sup>NS</sup>	0.38
	Total SEI	89	0.32	0.56	0.66	0.60	0.32	0.56	0.08 <sup>NS</sup>	0.40	0.14 <sup>NS</sup>	0.37
PWI-SC	92	0.61	0.71	0.69	0.67	0.64	0.69	0.45	0.52	0.25*	0.51	

Ns= correlation coefficient is not significant

All correlations are statistically significant at P < 0.01 except correlations signed by “ns”

The assumed correlations between KIDSCREEN-52 dimensions with similar constructs are bold.

**Table3- univariate analysis of variance (ANOVA) for comparison of socio-economic and psychological (mental) status in the KIDSCREEN-52 dimensions**

KIDSCREEN-52 dimensions	Mental health						F	Socioeconomic statuses				
	normal		borderline		abnormal			Low		High		F
	M	SD	M	SD	M	SD		M	SD	M	SD	
Physical well-being	74.62	14.31	74	16.27	72	13.60	0.14	65.82	15.86	73.75	15.18	7.97**
Psychological well being	79.29	16.74	68.94	16.92	62	18.34	6.30**	67.12	18.04	74.03	18.15	4.47*
Mood & emotions	71.48	14.86	63.90	12.64	54.57	21.10	6.35**	63.33	18.45	69.32	17.95	3.30
Self-perception	78.82	15.48	68.91	16.79	64	23.85	5.16**	74.06	18.30	78.74	14.74	2.38
Autonomy	67.02	13.04	66.18	18.55	64	17.99	0.18	62.73	16.25	66.04	18.14	1.14
Parent relation & home life	76.61	15.04	63.64	21.79	64.33	24.45	5.32**	65.25	21.23	75.26	19.31	7.39**
Social support & peers	63.77	14.45	67.12	14.30	65	15.42	0.43	63.43	17.15	61.40	14.87	0.48
School environment	72.68	14.99	66.06	15.59	65	11.78	2.32	68.03	14.84	71.87	13.14	2.27
Social acceptance & bullying	84.92	13.71	86.36	16.39	65.33	18	8.15**	83.03	15.87	85.38	14.39	0.73
Financial resources	71.48	20.62	61.82	23.11	63.33	23.36	1.93	60	21.72	79.18	18.98	26.77**

\*\*P &lt; 0.01, \* P &lt; 0.05

## Discussion

In the present research, the KIDSCREEN-52 validity and reliability in a sample of Iranian school students were tested and verified. The results of the confirmatory factor analysis on the 10-factor model indicated the model adequate goodness of fit in a population of the Iranian youth. The obtained Chi-square ( $\chi^2 = 3145.56$ ), Root Mean Square Error of Approximation (RMSEA = 0.053), and Comparative Fit Index (CFI = 0.97) in the current study are fairly consistent with the corresponding values found in Ravens-Sieberer et al<sup>[2]</sup> (i.e. 3303.75, 0.062, and 0.976) and in Haraldstad et al<sup>[13]</sup> (i.e.

3589.9, 0.041, and 0.99), meanwhile the obtained RMSEA in the present study has a slight advantage over the one found in Ravens-Sieberer et al<sup>[2]</sup>.

The results on convergent and divergent validity confirm acceptable correlations among the KIDSCREEN-52 dimensions (with exception of the two dimensions social acceptance and bullying and social support and peers) with the assumed corresponding dimensions in other constructs.

The relationships among the KIDSCREEN-52 dimensions with assumed corresponding dimensions in PedsQL version 4.0 were

moderate to strong, positive and significant one. These results are consistent with findings in the earlier studies [2, 12]. The dimension of social support and peers measures the nature of relations of child and adolescent with other peer groups. It concerns social relations with friends and peers and reveals the quality of the interaction between the child and adolescent with his /her friends and perceived supporters. The items in this dimension examine the degree to which the child feels being accepted and supported by friends and the child ability for developing and maintenance of his/her social relations. In this dimension, the aspects concerning the relationships with others are of special interest.

One reason for the low convergent validity coefficients for this dimension is that a conceptually similar scale was not available to be used for the verification of its convergent validity. As the low convergent validity coefficients among the dimension of social acceptance and bullying with other dimensions of this questionnaire is concerned, it should be pointed out that, similar results were also found in Halstead et al (2010). They explain that the bullying subscale reveals both feeling of rejection (exclusion) by friends and feeling of anger towards them. The low correlation among this dimension with the other 9 dimensions of the KIDSCREEN-52, signifies the fact that bullying is conceptually different from other scopes of quality of life [13]. Another possible

explanation is that this subscale seeks more direct visible aspects relative to other subscales. And finally, it should be noted that the items in this subscale (e.g. "Have other girls and boys made fun of you?") could arouse the respondent's resistance and make them feign a justified look and give wrong information. This subscale can be improved by using a different phrasing (rephrasing) of the questions.

The comparison of Subject's mental status based on the KIDSCREEN-52 dimensions revealed that those who were assigned to the abnormal category according to S&DQ, scored lower in all dimensions of the KIDSCREEN-52 also. This result was obtained in previous studies [2, 11, 35-38], and is indicative of KIDSCREEN-52 capability in assessing the quality of life in children with mental diseases. It is the claim made by authors for the questionnaire [2]. Moreover, comparison done on the examinees' socioeconomic status implies significant difference between the groups of low and high socioeconomic status in the KIDSCREEN-52 dimensions, especially in financial resources. These results are also consistent with the results declared in some other studies which suggest a declined socioeconomic status goes hand in hand with a lower quality of life [8, 11, 35, 37]. These findings also imply that KIDSCREEN-52 can be used for epidemic purposes and in clinical situations.

Analysis done to test the reliability of the questionnaire indicates acceptable reliability

coefficients in terms of Cronbach's alpha for all dimensions (with exception of social acceptance and bullying). Yet, mean inter-item correlation for social acceptance subscale is acceptable. In addition, the test-retest coefficients (with two-weeks interval) for all subscales are relatively strong. Parent relation and home life dimension, in consistent with earlier researches fulfills the greatest alpha<sup>[12]</sup>. In Ravens-Sieberer et al<sup>[2]</sup> study, social acceptance and bullying subscale has the smallest alpha (0.77) among 10 subscales of the questionnaire. In sum, in the current study, alpha coefficients in school environment, social acceptance and bullying, social support and peers, autonomy, self-perception, and physical wellbeing dimensions were smaller than those found in some other studies<sup>[2, 12, 13]</sup>.

One of the limitations for the present research was exclusion of the age group below 12 years old (primary school children) from the study. The authors were of the view that the primary school children were unable to comprehend and answer to some of the questions included in the questionnaire. Moreover, the conducted interview with the middle school children revealed that some of the first grade children had also difficulty in understanding some of the questions.

## References

1. Wilson IB, Cleary PD. Linking clinical variables with health-related quality of life. *J Am Med Assoc.* 1995;273(1):59-65.

Furthermore, Parent Report Form was not used in this study, while the literature support the employment of the Parent Report Form next to the child and adolescent report as a supplementary source to attain more accurate information about the children and adolescents quality of life. Finally, lack of children and adolescents with chronic physical or mental disease (clinical sample) in the study and fewer number of the second year high school students relative to other groups of the students, could mentioned as some other limitations of the present research.

## Conclusion

Concluding, these preliminary results are indicative of an adequate validity and reliability for the KIDSCREEN-52 dimensions (except for social acceptance and bullying) in a sample of Iranian school students, and the questionnaire by taking the necessary cautions can be applied for research purposes here in this country.

## Acknowledgements

We are Thankful to all students who participated in this study and the other professors in the department of clinical psychology in Shahed university.

2. Ravens-Sieberer U, Gosch A, Rajmil L, Erhart M, Bruil J, Power M, et al. The KIDSCREEN-52 quality of life measure for children and adolescents: psychometric results from a cross-cultural survey in 13 European countries. *Value in Health*. 2008;11(4):645-58.
3. Landgraf JM, Abetz L. Influences of sociodemographic characteristics on parental reports of children's physical and psychosocial well-being: early experiences with the Child Health Questionnaire. In: Maruish ME, editor. *Measuring health related quality of life in children and adolescents*. Mahwah, New Jersey: Lawrence Erlbaum Associated; 1998. p. 105-30.
4. Starfield B, Ensminger M, Riley A, McGauhey P, Skinner A, Kim S, et al. Adolescent health status measurement: development of the Child Health and Illness Profile. *Pediatrics*. 1993;91(2):430-5.
5. Ravens-Sieberer U, Bullinger M. Assessing health-related quality of life in chronically ill children with the German KINDL: first psychometric and content analytical results. *QUAL LIFE RES*. 1998;7(5):399-407.
6. Varni JW, Burwinkle TM, Seid M. The PedsQL TM 4.0 as a school population health measure: feasibility, reliability, and validity. *QUAL LIFE RES*. 2006;15(2):203-15.
7. Edwards TC, Huebner CE, Connell FA, Patrick DL. Adolescent quality of life, part I: conceptual and measurement model. *J ADOLESCENCE*. 2002;25(3):275-86.
8. Ravens-Sieberer U, Gosch A, Rajmil L, Erhart M, Bruil J, Duer W, et al. KIDSCREEN-52 quality-of-life measure for children and adolescents. *Expert Rev Pharmacoecon Outcomes Res*. 2005;5(3):353-64.
9. Ravens-Sieberer U, Auquier P, Erhart M, Gosch A, Rajmil L, Bruil J, et al. The KIDSCREEN-27 quality of life measure for children and adolescents: psychometric results from a cross-cultural survey in 13 European countries. *QUAL LIFE RES*. 2007;16(8):1347-56.
10. Erhart M, Ottova V, Gaspar T, Jericek H, Schnohr C, Alikasifoglu M, et al. Measuring mental health and well-being of school-children in 15 European countries using the KIDSCREEN-10 Index. *International journal of public health*. 2009;54:160-6.
11. Tebe C, Berra S, Herdman M, Aymerich M, Alonso J, Rajmil L. Fiabilidad y validez de la versión española del KIDSCREEN-52 para población infantil y adolescente. *Medicina clínica*. 2008;130(17):650-4.
12. Hong SD, Yang JW, Jang WS, Byun H, Lee MS, Kim HS, et al. The KIDSCREEN-52 quality of life measure for children and adolescents (KIDSCREEN-52-HRQOL): reliability and validity of the Korean version. *JKMS*. 2007;22(3):446-52.
13. Haraldstad K, Christophersen KA, Eide H, Natvig GK, Helseth S. Health related quality of life in children and adolescents: reliability and validity of the Norwegian version of KIDSCREEN-52 questionnaire, a cross sectional study. *NT J NURS STUD*. 2011;48(5):573-81.
14. Berra S, Bustingorry V, Henze C, Díaz MP, Rajmil L, Butinof M. Cross-cultural adaptation of the KIDSCREEN questionnaire to measure the health related quality of life in the 8 to 18 year-old Argentinean population. *Arch Argent Pediatr* 2009. p. 307-14.

15. Naeinian MR, Gohari Z, Matlabi nejad S, Baloochan M. Primary investigation of validity and reliability of personal well-being index school children version (PWI-Sc). Third congress of psychiatric; Tehran, Iran.2011.
16. Amiri P, M. Ardekani E, Jalali-Farahani S, Hosseinpanah F, Varni JW, Ghofranipour F, et al. Reliability and validity of the Iranian version of the Pediatric Quality of Life Inventory™ 4.0 Generic Core Scales in adolescents. *QUAL LIFE RES.* 2010;19(10):1501-8.
17. Jafari P, Ghanizadeh A, Akhondzadeh S, Mohammadi MR. Health-related quality of life of Iranian children with attention deficit/hyperactivity disorder. *QUAL LIFE RES.* 2011;20(1):31-6.
18. Engelen V, Haentjens M, Detmar S, Koopman H, Grootenhuis M. Health related quality of life of Dutch children: psychometric properties of the PedsQL in the Netherlands. *BMC Pediatr.* 2009;9(1):68.
19. Goldberg DP, Hillier V. A scaled version of the General Health Questionnaire. *PSYCHOL MED.* 1979;9(01):139-45.
20. Iwata N, Saito K. The factor structure of the 28-item General Health Questionnaire when used in Japanese early adolescents and adult employees: age-and cross-cultural comparisons. *Eur Arch Psychiatry Clin Neurosci.* 1992;242(2):172-8.
21. Cummins R, Lau ALD. *Personal Wellbeing Index–School Children.* Victoria, Australia: Deakin University; 2005.
22. Huebner ES. Preliminary development and validation of a multidimensional life satisfaction scale for children. *PSYCHOL ASSESSMENT.* 1994;6(2):149.
23. Gilman R, Huebner ES, Laughlin JE. A first study of the Multidimensional Students' Life Satisfaction Scale with adolescents. *Social Indicators Research.* 2000;52(2):135-60.
24. Zaki MA. Validation of multidimensional satisfaction of life scale in students. *Iranian journal of psychiatry and clinical psychology.* 2007;13(1):49-57.
25. Coopersmith S. *Self-esteem inventories.* Palo Alto, CA: Consulting Psychologists Press, Inc; 1981.
26. Lane GG, White AE, Henson RK. Expanding Reliability Generalization Methods with KR-21 Estimates an RG Study of the Coopersmith Self-Esteem Inventory. *EPM.* 2002;62(4):685-711.
27. Goodman R. Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry.* 2001;40(11):1337-45.
28. Garmaroodi GR, Moradi A. developing a questionnaire for assessing socio-economic status in Tehran city. *Health Monitor.* 2010;9(2):137-44.
29. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika.* 1951;16(3):297-334.
30. Nunnally JC, Bernstein IH. *Psychometric theory.* 1994. McGraw, New York. 1991.
31. Bentler PM. Comparative fit indexes in structural models. *Psychological bulletin.* 1990;107(2):238.
32. Browne MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, editors. *Testing Structural Equation Models.* 154. Beverly Hills, CA: Sage; 1993. p. 136-62.

33. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999;6(1):1-55.
34. Mulaik SA, James LR, Van Alstine J, Bennett N, Lind S, Stilwell CD. Evaluation of goodness-of-fit indices for structural equation models. *Psychological Bulletin*. 1989;105(3):430.
35. Rajmil L, Palacio-Vieira JA, Herdman M, López-Aguilà S, Villalonga-Olives E, Valderas JM, et al. Effect on health-related quality of life of changes in mental health in children and adolescents. *Health Qual Life Outcomes*. 2009;7:103.
36. Kenney K. Social support and health-related quality of life among healthy middle-childhood aged siblings of chronically ill children: TEACHERS COLLEGE, COLUMBIA UNIVERSITY; 2010.
37. Park J, Turnbull AP, Turnbull HR. Impacts of poverty on quality of life in families of children with disabilities. *Except Child*. 2002;68(2):151-70.
38. Mansour ME, Kotagal U, Rose B, Ho M, Brewer D, Roy-Chaudhury A, et al. Health-related quality of life in urban elementary schoolchildren. *Pediatrics*. 2003;111(6):1372-81.