

ORIGINAL ARTICLE

Psychometric Properties of the Persian Version of Self-Transcendence Scale: Adolescent Version

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ABSTRACT

Background: Given the greater tendency during adolescence toward risk-taking, identifying and measuring the factors affecting the adolescents' health is highly important to ensure the efficacy of health promoting interventions. One of these factors is self-transcendence. The aim of this study was to assess the psychometric features of the Self-Transcendence Scale (adolescents' version) in students in Tehran, the capital city of Iran.

Methods: This research was conducted in 2015. For this purpose, 1210 high school students were selected through the multistage cluster sampling method. After the backward-forward translation, the psychometric properties of the scale were examined through the assessment of the (face and construct) validity and reliability (internal consistency and stability) of the scale. The construct validity was assessed using two methods, factor analysis, and convergence of the scale with the Hopefulness Scale for Adolescents.

Results: The result of face validity was minor modifications in some words. The exploratory factor analysis resulted in the extraction of two dimensions, with explaining 52.79% of the variance collectively. In determining the convergent validity, the correlation between hopefulness score and self-transcendence score was $r=0.47$ ($P<0.001$). The internal consistency of the scale was determined using Cronbach's alpha of 0.82 for the whole scale and 0.75 and 0.70 for each of the sub-scales. The stability reliability was found to have an ICC of 0.86 and a confidence interval of 95%.

Conclusion: The Persian version of the Adolescents' Self-Transcendence Scale showed an acceptable validity and reliability and can be used in the assessment of self-transcendence in Iranian adolescents.

KEYWORDS: Adolescents; Factor Structure; Psychometric; Self-Transcendence

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INTRODUCTION

With the rapid physical, emotional, cognitive and social changes typical to it, adolescence is one of the most sensitive periods of human life and a major development stage considered critical and high-risk.¹ The risks that threaten the adolescents include health-related problems such as anxiety and depression,² destructive behavioral disorders and drug abuse,^{2,3} alcohol consumption, high-risk sexual behaviors, and suicide.⁴ These risks show the need for the performance of early interventions and preventive measures during this period.² It is, therefore, highly important to identify and measure the factors affecting the adolescents' health in order to ensure the efficacy of their target health-promoting interventions. One of these factors is self-transcendence, which is proposed by nursing theoreticians as the basis for feeling good and healthy.⁵ The theory of self-transcendence, which forms the theoretical framework of this study, is an empirical nursing theory that has originated from human development processes and in relation to the phenomenon of development in health. Development processes such as a toddler's first time walking and an adolescent's capability for abstract reasoning are among the basic human characteristics and needs that indicate an intrinsic talent for achieving health. Individuals' endeavor to obtain self-transcendence is, therefore, an attempt for achieving health, and nurses play a major role in facilitating this process.⁶ As a coping strategy, self-transcendence is followed by adjustment to physical, emotional and spiritual problems⁷ and leads to the preservation and promotion of health and an improved quality of life for humans.⁸

Many different tools have been designed to date for the assessment of self-transcendence in various age groups,⁹⁻¹¹ one of the most applicable of which is Reed's Self-Transcendence Scale, which has been translated into various languages and has had its psychometric characteristics examined.¹²⁻¹⁵ Focusing on the social and cultural context within which different age groups (especially adolescents) live is essential to the promotion

of the health status and prevention of high-risk health behaviors.¹⁶ Nevertheless, considering the dominant cultural and religious atmosphere of Iran¹⁷ and given the direct effect of self-transcendence on the degree of health in its various aspects,¹² promoting self-transcendence can be considered a health-promoting strategy for Iranian adolescents. Given the importance of self-transcendence and lack of a proper tool for its assessment in Iranian adolescents, the present study was conducted to translate the Reed's self-transcendence scale (adolescents' version) into Persian and carry out a psychometric assessment of this version.

PATIENTS AND METHODS

Participants

The present methodological study¹⁸ was conducted on 1210 adolescent students in Tehran using the multi-stage cluster sampling method from January 2015 to May 2015. In order to achieve a representative sample, Tehran was divided into three regions: north, central and south. Each area was considered as a cluster including 22%, 51% and 27% of samples, respectively. From each cluster, according to student population, some schools were selected by simple random sampling. The classes were selected in this school and in different grades by random sampling, and some students were chosen from it.

The study inclusion criteria consisted of being aged 16 to 20, being a student of the last 3 years of high school, having good cognitive (auditory and speech) and psychological health confirmed by the school's health officer, and being willing to participate in the study. Incomplete answers to the scale items meant exclusion from the study.

Instrument

The self-transcendence scale (STS) was developed by Professor Pamela Reed from a 36-item scale, the "Developmental Resources of Later Adulthood" in 1986. In factor analysis, Self-transcendence was the primary factor.

Then it was considered as an independent tool.¹⁵ Reed's Self-Transcendence Scale has been translated into various languages and has had its psychometric characteristics examined.¹²⁻¹⁵ In 1987, the adolescent version of this scale was modified for exclusive use in this group⁶ and the last modification on this version was performed in 2014 by Reed. This version was taken directly from its designer and then translation and psychometric evaluation was done.

Reed's self-transcendence scale is a one-dimensional scale containing 15 items that, collectively, reveal certain features of development and maturity in the form of expanded personal boundaries and is scored based on a 4-point Likert scale from 1 (never) to 4 (always). The items are able to introspectively assess the individual's wellbeing factor through cognitive, creative, social and spiritual means. The scale scores range from 15 to 60 (from 1 to 4 for each item), and the higher scores indicating a greater self-transcendence. The content and construct validities of the scale have been assessed and reported as favorable in various studies. The internal consistency of the scale was measured through Cronbach's alpha estimated at 0.8 to 0.88.¹²

Translation Procedures

After obtaining permission from the designer of the scale and receiving the original version from her, the translation and psychometric processes were carried out based on the model proposed by Wild et al.^{18,19} This model holds 8 stages for the translation and cultural adaptation of the scale and was conducted by experts in both Persian and English languages. Reed's self-transcendence scale (adolescents' version) was first separately translated into Persian by two experts of English. The two translations were then compared and briefly modified to produce the final version. For the backward translation, the final version was shown to two experts of English (one native English speaker), and the produced version was

then compared to the original version by an observer. The scale was then distributed among 10 eligible adolescents to express their views on the comprehensibility of the items. The completed scales were then collected and used for the assessment of its (face and construct) validity and reliability (internal consistency and stability).

Ethical Consideration

Data were collected only after the necessary permissions were obtained from the authorities and when the participants were briefed on the study objectives and methods and submitted their informed written consent. The participants were also ensured about the confidentiality of their data and their right to withdraw at any stage of the study.

Data Collection

Three questionnaires: the self-transcendence scale (adolescents' version), the hopefulness scale for adolescents (to assess the convergence validity) and the demographic questionnaire were distributed among 1210 participants, by going to the selected schools in Tehran, from January 2015 to May 2015. All the three tools were completed in about 15 to 20 minutes, in total.

Data Analysis

In the assessment of the face validity of the scale, to ensure the clarity of the items the opinions of 10 experts were sought, including 4 experts in psychometrics and instrument development, 2 nursing faculty members familiar with the concept, 2 psychiatric nursing educators and 2 individuals familiar with Islamic knowledge and theology. The construct validity of the scale was assessed through two methods: factor analysis and convergence of the study scale and the hopefulness scale for adolescents. Confirmatory factor analysis was performed for this aim. Due to the lack of fit with the young Iranian adolescents, exploratory factor analysis was done. The exploratory factor analysis was used to extract the dimensions given the one-dimensionality of the scale.^{18,20}

Next, the scree plot and the Eigenvalue methods were used to determine the constituent factors of the self-transcendence scale (adolescents' version), and the varimax rotation was used for the simplification and interpretability of the factor construct. The adequacy of sampling was assessed with the Kaiser-Meyer-Olkin index and the feasibility of the factor analysis with Bartlett's test.²¹ Given that the concept of self-transcendence is significantly correlated with the concept of hopefulness and that one increases with the other,¹⁰ the convergent validity of the scale was assessed through determining the correlation between the self-transcendence score and the hopefulness score in adolescents. The Hopefulness Scale for Adolescents designed by Pamela Hinds (1985) was used for this purpose, since its psychometric properties have already been verified in Iran in a sample of 1918 students. This scale contains 24 items, and its validity has been determined through assessing its construct validity using the exploratory factor analysis. Its reliability has been confirmed through measuring Cronbach's alpha ($\alpha=0.83$) and through the test-retest method ($r=0.46$). The Persian version of this scale was finally presented with 22 items in two dimensions.²² The present study reported a Cronbach's alpha of 0.75 for the Hopefulness Scale for Adolescents. To determine the correlation between the mean hopefulness score and the mean self-transcendence score, both scales were

distributed among the participants ($n=1210$).²³

To assess the reliability of the scale, its internal consistency [33] and stability were determined.^{24,25} The internal consistency of the scale was measured through calculating the Cronbach's alpha in a sample of 1210 ($n=1210$), and its stability through calculating the ICC in a sample of 20 eligible adolescents (by considering a period of 14 days between the two times for completing the questionnaires). Data were analyzed in SPSS-20.

RESULTS

Description of Sample

A total of 1210 high school students completed the self-transcendence scale. Table 1 presents some demographic characteristics of the participants.

Translation

The only misgiving about the translation of the scale was item 15, "Letting go of my past regrets" in the original version and "Not regretting my past" in the translated version. The issue was discussed with the designer of the scale, and she approved the translated sentence.

Validity

The validity of the scale was assessed through measuring its content and construct validities using factor analysis and the

Table 1: Participants' demographic characteristics ($n=1210$)

Demographic characteristics		Frequency	Percent
Sex	Male	603	49.8
	Female	607	50.20
Age (year)	15	34	2.8
	16	532	44
	17	495	40.9
	18	140	11.6
	19	9	7
Grade	Second	348	28.8
	Third	503	41.6
	Fourth	359	29.7
Family Type	Living with both parents	1061	87.7
	Living with one parent	130	10.7
	other	19	1.6

convergent validity approaches.

Face Validity

In the measurement of the face validity of the scale, the only ambiguous item according to the experts and some of the eligible students was “I enjoy the rhythm of my life”, which was resolved by changing “rhythm” to “flow”.

Construct Validity

The exploratory factor analysis was used to extract the potential dimensions. The Kaiser-Meyer-Olkin index was measured as 0.94 and the Bartlett’s test as 1523.649 (P<0.001). The minimum factor loading of the present study was taken as 0.3. The factor analysis resulted in a 2-factor model using the Eigenvalue. To verify this model, the factors analysis was also performed under the assumption of having 3 factors. Data relating to each of the analyses are shown in Table 2.

In the extraction of the two dimensions

that explained 52.79% of the variance, factor loadings for items 3, 5 and 7 were loaded on both factors. This issue was fixed, taking into account the level and content of each item, and thus items 3 and 5 were loaded on the first factor and item 7 on the second. The first factor was “self-acceptance”, which explained 46.12% of the variance by itself. The second factor was “Maturation”, which explained 6.67% of the overall variance of the scale. The scree plot also confirmed the selection of the 2 factors, since from the second factor onward, the factors were almost on the same level and the slope of the plot, too, was negligible due to the proximity of the Eigenvalues (Figure 1). In the selection of the 3-factor model (that explained 58.32% of the variance), since items 3, 4, 5, 7, 8, 11 and 14 were loaded on two factors, and since, with the Eigenvalues, too, the items were loaded on two factors, and in the scree plot, too, the selection tended more toward two factors, the two-factor model was

Table 2: Factor loadings for two and three extracted factors after varimax rotation (n=1210)

N	Items	Factor loading of 2- factor model		Factor loading of 3-factor model		
		Factor1	Factor2	Factor1	Factor2	Factor3
		52.788 % of Variance		58.325% of Variance		
1	Having hobbies and interests that I can enjoy.	0.670			0.571	
2	Having accepted myself as a person growing to an adult.	0.643		0.616		
3	Communicating with other people and my community when it is possible.	0.607	0.438	0.526	0.426	
4	Adjusting myself well with my current living situation.	0.672		0.413	0.587	
5	Adjusting myself with the changes in my body during the growth period.	0.615	0.407	0.466	0.479	
6	Sharing my special skills and experiences with others.		0.662			0.624
7	Understand the meaning of my past experiences.	0.400	0.654	0.492		0.546
8	Helping younger or any other people in any way I can.		0.689	0.427		0.598
9	Being interested in continuing the learning.	0.667		0.672		
10	Having put aside some things that I thought important some time.		0.730			0.784
11	Accepting that life has difficulties.		0.674	0.535		0.540
12	Realize the meaning of my spiritual beliefs.		0.501	0.590		
13	Letting people help me when I may need their help.	0.442		0.652		
14	Enjoying the pace of my life.		0.795	0.433	0.686	
15	Not regretting my past.		0.558		0.777	

Extraction method: principal component analysis.

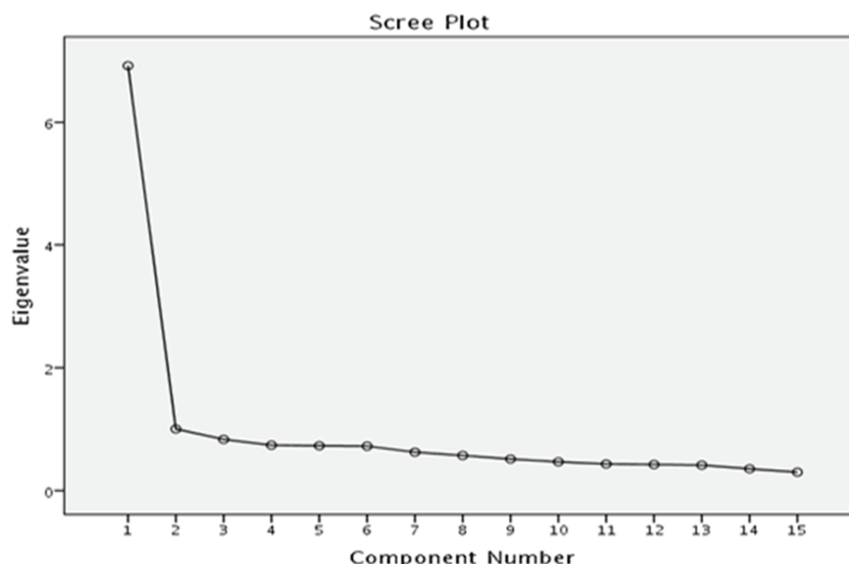


Figure 1 : Score plot in Self-Transcendence Scale – Adolescent Version (2- factor model)

proposed by the study.

Convergent Validity

In the assessment of the convergent validity of the scale, both tools (self-transcendence scale, adolescents’ version, and the hopefulness scale for adolescents) were distributed among the participants simultaneously. Then the correlation between the hopefulness score and the self-transcendence score was determined ($r=0.47$ and $P<0.001$).

Internal Consistency and Interclass Correlations

In calculating the internal consistency of the scale, the Cronbach’s alpha coefficient was measured. The coefficient and the range of inter- item correlation was 0.82 and 0.46, respectively. The Cronbach’s alpha value and the mean and standard deviation of the whole scales and also each of the self-transcendence scale’s dimensions are presented in Table 3. The Interclass Correlation Coefficient (ICC) was also calculated using the One-Way Random

Effect model, which showed a single measure ICC of 0.86 and a confidence interval of 95% in the population of Iranian adolescents.

DISCUSSION

Self-transcendence gains a greater significance as a health promoting factor during adolescence, which is a period characterized by the highest vulnerability.¹ Despite the positive effect of this concept on adolescents’ health, nursing interventions to promote this quality are not performed for this age group. One of the main reasons for the absence of such interventions is the lack of validated assessment tools in Iran. Using tools translated from other languages and societies requires validation to ensure that they are appropriate.¹⁸ The present study was conducted to translate and validate the self-transcendence scale (adolescents’ version).

Determining the content validity of translated tools is highly crucial. The present study used face validity that was performed

Table 3: Mean scores and Cronbach’s alpha coefficient in the self-transcendence scale (adolescents’ version) and the hopefulness scale for adolescents and their dimensions in Iranian adolescents

Scale	Mean±SD/ α		Total Scale
	Factor1	Factor 2	
Adolescents Hopefulness Scale	66.49±8.38/0.87	18.29±6.45/0.86	84.78±8.44/0.75
Self- Transcendence Scale- Adolescents version	20.99±7.99/0.75	23.53±9.38/0.70	44.52±17.39/0.82

according to the views of experts in the field and also of the study participants. With the exception of minor changes made to some of the words, all the items were found acceptable, indicating the appropriate content of the scale.

The construct validity of the scale was assessed using the factor analysis and the convergent validity approaches. Although the original version is reported as a one-factor scale, the factor analysis performed in the present study extracted two factors, taking into account the Eigenvalues and the scree plot. The two factors proposed in the factor analysis were named “self-acceptance” and “maturation” based on the meaning of the items in each factor both separately and in relation to the other items in the same factor, and also in accordance with the scale’s concept and a review of literature and relevant theories. Naming the factors is a subjective process that often uses theoretical concepts.²⁶

Self-acceptance: The theory of acceptance shows a positive relationship between self-acceptance and the acceptance of others, and insists on realistic outlooks instead of defensiveness, non-acceptance or denial in describing behaviors.²⁷ An example of an item that led to this name was “I accept myself as a person who is growing and turning into an adult”.

Maturation: The extraction of this item in the Persian version of the scale might be attributed to the dominant culture and religion of Iran. According to various theories, maturity is known as a personal, culture-based concept that entails personal, philanthropic, self-accepting and self-criticizing motives.²⁸ A direct correlation is also observed between religion and maturity in individuals,^{29,30} and the concept of self-transcendence encapsulates spirituality and awareness.^{10,31} Maturity can be studied from two perspectives; the actor and the observer. From the former perspective, maturity entails accountability toward other people’s needs, and from the latter, it indicates credibility—that is, accountability, predictability and stability of feelings.²⁸ An example of an item

that led to this name was “I help others in any way I can”.

The factor analysis of the Korean version of this scale revealed 4 factors for the tool; however, the 4 factors were not named.¹³ In the Persian version of this scale for adults, factor analysis was not performed and the scale was used with its original one dimension.¹⁴ Two factors were also extracted in the Norwegian version; the first was named “interpersonal” (with 7 items) and the second “intrapersonal” (with 8 items).¹⁵ The first dimension of the Norwegian scale is close to what was found in the present study, as it shows self-transcendence in an interpersonal dimension. The second dimension is also similar in both scales and reveals a transpersonal expansion. Self-transcendence contains interpersonal, intrapersonal, transpersonal and temporal dimensions.⁶ A scale designed for the assessment of self-transcendence in adults proposed two factors called “alienation” and “self-transcendence”.¹⁰ In the self-transcendence factor of this scale, there are items that resemble the items in the “maturation” factor of the present study in terms of meaning. For instance, “I find joy in life” and “Enjoying my pace of life” were both present in both scales and were loaded on the discussed factors. Items of the “alienation” factor are in conflict with those of the “self-acceptance” factor in the present study and propose isolation as opposed to communication and connection. This opposition might be attributed to the religious beliefs of Iranian adolescents, who are constantly encouraged by the verses of the Quran and religious anecdotes to accept themselves as human beings. Sociability is an intrinsic quality of the creation of mankind. “O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another” (Surat Al-Hujurat, verse 13).

In “Spiritual self-transcendence scale”, three dimensions were extracted: “connectedness”, “universality” and “prayer fulfillment”. This scale was designed by Piedmont in 1999, to

organize and define spirituality as an internal source of motivation to find meaning in life. It has 24 items, and is designed in two forms; the first one was set for self-reported and the latter by asking the statements. Both forms were designed in five-point Likert scale. This scale is used between Muslims, Christians and Hindus Hindi.¹¹ In terms of meaning, these factors were close to what was proposed in the present study and are indicative of belief in God and sociability, which are also observed among Iranian adolescents given their religious tendencies. In the last scale, three dimensions were extracted in the factor analysis: “self-forgetfulness”, “transpersonal identification” and “spiritual acceptance”,⁹ which confirm the dimensions proposed by Piedmont as well as by the present study to a certain degree.

Self-transcendence can, therefore, be said to be a concept with many commonalities between societies that is considered universal by Piedmont.³² An example is maturity that is contextually perceived in all the discussed scales. Minor differences in the discussed scales might be due to other promoting strategies or can result from self-transcendence that can be explained in the cultural context of each society. The significant direct correlation between self-transcendence and hopefulness¹⁰ was assessed in the present study, indicating the appropriate correlation between these two concepts and confirming the construct validity of the scale.²³ This correlation might be attributed to religious teachings that emphasize hope in the Divine Mercy.

In determining the reliability of the scale, the internal consistency (Cronbach's alpha) and stability (the ICC) of the scale were assessed.^{24,25} The Cronbach's alpha obtained confirmed the high internal consistency of the scale and each of the sub-scales. The coefficient of 0.7 indicates an adequate internal consistency and any value above 0.8 shows a high level of internal consistency.³³ The stability of the scale was found to be at a very favorable level, since values between 0.75 and 1 are considered excellent.³⁴ The results of the

internal consistency measured in the present study were consistent with those obtained in the majority of other studies.^{12,13,15,35-37} The internal consistency of the Persian version of Self-Transcendence Scale in adults was reported 0.68; the low Cronbach's alpha value reported might be due to the non-compatibility of the scale for use in the population of Iranian adults and might be due to the fact that construct validity was measured using a method other than the factor analysis.¹⁴

A limitation of the present study was the assessment of high school students entangled in conditions of stress and vulnerability for preparation for the nation-wide university entrance exam, which might have affected their degree of self-transcendence.

CONCLUSION

Psychometric properties of adolescent's version of the self-transcendence scale were determined in Iranian adolescents. The result shows that this scale is approved according to translation and cultural adaptation, and it can be used by nurses and others whose concern is health of Iranian adolescents.

Since self-transcendence is designed as a one-dimensional scale, given the 2-factor nature of the scale in the present study, this may be due to cultural influences or life experience perceived by Iranian adolescents. Thus according to this and regarding the various definitions provided for this concept to date, further qualitative studies are recommended to be conducted on this group for the better understanding of the concept according to the dominant culture and religion of Iran –Islam.

It is suggested that this scale should be used in the field and among different ages of adolescence and the results of each compared with each other.

Moreover, due to the extraction of two factors in the present study and use of a limited number of ways to determine the validity, it is recommended that in future studies other methods should be used to assess validity.

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Conflict of Interest: None declared.

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