

Reliability and Validity of Persian Version of State-Trait Anxiety Inventory Among High School Students

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Abstract

Objectives: The aim of the present study was to assess the reliability and validity of the Persian version of the State-Trait Anxiety Inventory Form Y (STAI-Y) among high school students.

Methods: A sample of 492 high school students in Kermanshah city, Iran were randomly selected via multistage sampling. They were asked to complete the STAI-Y and Beck Anxiety Inventory (BAI) to determine the correlation coefficients. Data analysis was performed via descriptive statistics, factor analysis, Cronbach's coefficient alpha, and Pearson correlation coefficient.

Results: In the Persian version of STAI-Y, the Cronbach's alpha for internal consistency was 0.886 for trait anxiety and 0.846 for state anxiety. The convergent validity between STAI-Y and BAI was 0.612 for trait anxiety and 0.643 for state anxiety ($p < 0.001$).

Conclusion: The reliability, internal consistency, and validity of the Persian version of the STAI-Y is good among high school students in Kermanshah.

Key words: Anxiety disorders; Reproducibility of results

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Submitted: 13 August 2018 **Accepted:** 9 July 2019

Introduction

Anxiety is a psychological construct in various mental disorders and neuroses. Anxiety is associated with obsessive thoughts, depression, and psychosomatic disorders, and is the background of mental disorders. Anxiety, as a state of apprehension with physical symptoms indicative of autonomic apparatus hyperactivity, is distinct from fear, which is a relevant response to a threat. Anxiety is a response

to a vague unclear or conflictual threat.¹⁻³

Although a set of cognitive tests have been used to highlight the status of anxiety quantifications and analyses, they fail to assess the clinical roles of anxiety. The Hamilton Anxiety Rating Scale has clinical and research implications, but the scale is unable to distinguish between anxiety and depression.^{4,5} The Beck Anxiety Inventory (BAI) has been used to measure anxiety levels for those who are clinically disturbed or who are in anxiety. Despite sufficient validity and reliability, the inventory mostly covers cognitive and physical aspects of anxiety, and the overlapping of anxiety and depression measurements in the inventory is lower than that of other inventories. Some questionnaires are based on anxiety creation, whereas others focus on specific aspects of anxiety such as examination anxiety or personality traits. Some tools have attempted to address the multi-dimensional nature of anxiety.^{3,5,6}

The State-Trait Anxiety Inventory Form Y (STAI-Y) has been used to measure state and trait anxiety of individuals. State anxiety is defined as a stressful part of a person's life, whereas trait anxiety attributes to individual differences in response to stressful situations.⁷⁻⁹

Anxiety is a fundamental component of neurotic disorders; therefore, psychometric tests are important for making diagnoses, especially among at-risk populations (eg, high school students). Nonetheless, unrevealed anxiety can result in bad consequences. Undetected anxiety puts the afflicted adolescence and youth at risk of lower self-confidence, through which personal and social mental health is endangered.⁷ Therefore, a specified and valid test is needed to detect anxiety for specified populations. The

norms of psychometric tests are in no way absolute, general or eternal but only reflective of functioning as a norm sample.

Lack of precise norms for different anxiety test hinders clinical psychologists in making diagnosis and interpretation. The aim of the present study was to assess the reliability and validity of the Persian version of STAI-Y among high school students in Iran.

Methods

Two high schools (one with only female students and another with only male students) from each of three districts in Kermanshah city, Iran were randomly selected. A total of 492 students in different grades and disciplines were included. The sample size was calculated based on the study by Moghaddam et al.¹⁰

The STAI-Y comprises 40 self-report items in a 4-point Likert scale. Items 1 to 20 evaluate state anxiety with four options (not at all, somewhat, moderately so, very much), whereas items 21 to 40 evaluate trait anxiety with four options (almost never, sometimes, often, almost always). State anxiety is an emotional response that varies from one situation to another.¹¹ Individuals were asked to respond in accordance with 'their present mood'. Trait anxiety is a personality trait that reflects the frequency and severity of a person's emotional response to pressure. Trait anxiety is a personal attribute, not a situational state encountered by an individual. Individuals were asked to respond based on 'their fixed personality trait'. There is a strong correlation between the trait anxiety subscale and other tests measuring anxiety: the correlation between the trait anxiety subscale and Taylor Manifest Anxiety Scale is 0.79 to 0.83, whereas the correlation between trait anxiety subscale and Affective Adjective Checklists is 0.52 to 0.58.¹² STAI-Y items have high internal consistency, with a median Cronbach's alpha of 0.92 for state anxiety and 0.9 for trait anxiety.¹³ Its reliability through the test-retest method is 0.695 to 0.765 for trait anxiety and 0.16 to 0.62 for state anxiety.¹⁴ The STAI-Y can be applied in groups or individually and as a self-test.^{15,16}

The STAI-Y was translated into Persian by two separate teams of researchers and experts in the English language. At a joint meeting to resolve any discrepancy, the two versions were formed into one unitary version, which was reviewed by an expert in the Persian language, an expert in the English language, and two psychologists to rectify any possible errors. The Persian version was back-translated into English by an expert with a PhD in English literature. Discrepancies were resolved by a comparative review of the back-translated version and the original one. To get feedback regarding the questionnaire's instructions, understanding of the content of the questions, and solving possible issues in the items, the prepared version was tested in a pilot study of 70 students selected by accessible sampling.

The BAI emphasises on psychological aspects of

anxiety and comprises 21 items (three for anxious mood, four for specific fears, and 14 for hyperactivity symptoms and motion tensions related to generalised anxiety).¹⁶ Scores for each item range from 0 to 3; the maximum score is 63. Its internal consistency is 0.92, and reliability through retest after a week is 0.75, and items correlation varies from 0.3 to 0.76.¹⁷⁻¹⁹ Psychometric studies in Iran have reported a reliability coefficient of 0.8 (after 2 weeks through retests) and 0.7 (through retests).²⁰

Data analysis was performed using SPSS (Windows version 25; IBM Corp, Armonk [NY], US). Reliability was assessed using the test re-test method; Cronbach's alpha for internal consistency was also assessed. Validity was assessed using factor analysis through content validity, convergent validity, and structural validity.

Results

Of 492 students (258 girls and 234 boys), 187 were aged 14-15 years, 149 were aged 16-17 years, and 156 were aged 18-19 years. Their field of study included general study (n = 188), experimental sciences (n = 128), humanities (n = 131), and mathematics (n = 45) [Table 1].

In the Persian version of STAI-Y, the Cronbach's alpha for internal consistency was 0.886 for trait anxiety and 0.846 for state anxiety. The reliability through the test re-test method was 0.765 for trait anxiety and 0.62 for state anxiety. The reliability coefficients for items 1 to 20 (state anxiety) was 0.889, and for items 21 to 40 (trait anxiety) was 0.854. None of the items was omitted owing to the high and positive correlation coefficient. The convergent validity between STAI-Y and BAI was 0.612 for trait anxiety and 0.643 for state anxiety (p < 0.001).

In the rotational matrix for state anxiety, item 4 was complex, with both anxiety factor and no anxiety factor having almost equal factor loadings (Table 2). In items 14,

Table 1. Characteristics of 492 high-school student participants

Variable	No. (%) of participants
Sex	
Boys	234 (47.6)
Girls	258 (52.4)
Age, y	
14-15	187 (38.1)
16-17	149 (30.3)
18-19	156 (31.6)
Field of study	
General	188 (38.3)
Experimental sciences	128 (26.2)
Humanities	131 (26.4)
Mathematics	45 (9.1)

Table 2. Rotational matrix results for trait and state anxiety factor in the Persian version of State-Trait Anxiety Inventory Form Y

Item No	Item	Factor loading coefficient	
		First factor (anxiety factor)	Second factor (no anxiety factor)
State anxiety			
10	I feel comfortable	0.674	
16	I feel content	0.669	
1	I feel calm	0.619	
8	I feel satisfied	0.619	
20	I feel pleasant	0.68	
5	I feel at ease	0.587	
15	I am relaxed	0.587	
2	I feel secure	0.564	
11	I feel self-confident	0.516	
18	I feel confused	0.463	
19	I feel steady	0.438	
3	I am tense	0.402	
14	I feel indecisive	0.396	
13	I am jittery		0.785
12	I feel nervous		0.703
9	I feel frightened		0.598
7	I am presently worrying over possible misfortunes		0.596
17	I am worried		0.548
4	I feel strained	0.406	
6	I feel upset		0.460
Trait anxiety			
26	I feel rested	0.676	
36	I am content	0.657	
30	I am happy	0.651	
21	I feel pleasant	0.564	
33	I have disturbing thought	0.617	
23	I feel satisfied with myself	0.563	
39	I am a steady person	0.545	
34	I make decision easily	0.506	
27	I am calm, cool, and collected	0.450	
22	I tire nervous and restless	0.429	
37	Some unimportant thoughts run through my mind and bother me		0.740
38	I take disappointments so keenly that I cannot put them out of my mind		0.709
40	I get in a state of tension or turmoil as I think over my recent concerns and interests		0.620
29	I worry too much over something that really doesn't matter		0.549
31	I am inclined to take thing hard		0.561
25	I feel like a failure		0.515
28	I feel that difficulties are piling up so that I cannot overcome them		496.0
32	I lack self _confidence		0.388
24	I wish I could be as happy as others seem to be		0.378
35	I feel inadequate		0.342

3, and 18, the first factor content was similar to the second factor content. Other items were pure without complexity. The highest coefficients in the factor loading matrix (the correlation of the items to each factor) were item 13 (I am jittery) and item 12 (I feel nervous), with the factor loading of >0.7 . These were followed by items 10 (I feel comfortable), 16 (I feel content), 1 (I feel calm), 7 (I am presently worrying over possible misfortunes), and 20 (I feel pleasant), with a factor loading of >0.6 .

Based on the factor loading matrix, all items unanimously relating to a factor contributed to the construction of a state anxiety subtest. First factor (anxiety factor) included 13 items (items 10, 16, 1, 8, 20, 5, 15, 2, 11, 18, 19, 3, and 14), with item 10 having highest loading (0.674) and item 14 having lowest loading (0.396). Second factor (no anxiety factor) included 7 items (items 13, 12, 9, 7, 17, 4, and 6), with item 13 having highest loading (0.785) and item 4 having lowest loading (0.406).

In the rotational matrix for trait anxiety, items 22 and 28 were complex, and their factor loadings were almost equal (Table 2). The rest of the items lacked any complexity. The highest coefficient in the factor loading matrix was related to items 12, 13, 37, and 38 (with factor loading of >0.7), followed by items 10, 16, 8, 20, 26, 36, 30, 21, and 40 (with factor loading of >0.6). Based on the factor loading matrix, all items unanimously relating to a factor contributed to the construction of a state anxiety subtest. First factor (anxiety factor) included items 26, 36, 21, 33, 39, 34, and 27. Second factor (no anxiety factor) included items 37, 38, 40, 29, 31, 25, 28, 22, 32, 24, and 35.

Discussion

Anxiety is of high significance in terms of clinical and non-clinical dimensions as well as different social, familial, occupational, and educational situations. Experts in various areas have used various tools to measure anxiety. Initially, these tools possess more general aspects and then more specified tools such as STAI-Y are developed.

Consistent with our findings, a study of 237 Malaysian urologic patients reported that the STAI-Y was reliable and valid in terms of specificity and sensitivity. It has good sensitivity in diagnosing state-trait anxiety among urologic patients.¹⁶ In the study by Spielberger et al, the STAI-Y was reported to have a Cronbach's alpha of 0.90 and validity ranging from 0.73 to 0.86.⁹ In a study of 71 undergraduate students, the STAI-Y is highly reliable in distinguishing between trait anxiety and state-trait anxiety.²¹ In a study of 67 patients with a mean age of 36.8 years, the STAI-Y has acceptable validity and serves as a diagnostic tool in clinical, non-clinical, and research practices.¹³ In the study of 341 students aged 19 to 25 years, the STAI-Y has acceptable psychometric properties.²² In an Iranian population, the correlation coefficients for state and trait anxieties were 0.84 and 0.76, respectively; these factors were the STAI-Y subtests and can be used as a reassuring tool to measure various types of anxiety.²³

The results of the present study are consistent with those of a study of Malaysian engineering students using STAI-Y through test and re-test.²² The construct validity, test reliability, and correlation coefficients of the STAI-Y were calculated through Cronbach's alpha; factor analysis and correlation coefficients were used to determine the tool validity. The reliability coefficient of the test was 0.58.²²

Conclusion

The Persian version of the STAI-Y has acceptable psychometric characteristics and is a valid tool to measure state and trait anxiety among high school students in Kermanshah, Iran. Nonetheless, the results may not be generalised to other populations. In addition, latent anxiety rates are higher among girls than among boys; this can be attributed to social and cultural factors.

Acknowledgements

The authors would like to thank the Substance Abuse Prevention Research Center, Clinical Research Development Center, Imam Khomeini and Mohammad Kermanshahi and Farabi Hospitals, Kermanshah University of Medical Sciences, Kermanshah, Iran for their support, cooperation, and assistance.

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