Research Paper: Reliability and Validity of the Persian Version Emotional Self-efficacy Scale for Young Adolescents

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ABSTRACT

Background: The present research aimed at determining the reliability and validity of the Persian version of the Emotional Self-Efficiency Scale (ESES) for adolescents of Isfahan city. This study was conducted using a developmental research method. The statistical population consisted of all the first-grade high school students of Isfahan city in 2018 (n=59396).

Methods: A total number of 280 students (160 girls and 120 boys, Mean±SD age of 12.98±1.14) were selected using a stratified random sampling method, and completed ESES for adolescents (2015), as well as Self-Efficacy Questionnaire for Children (2001).

Results: An Exploratory Factor Analysis (EFA) revealed the four-factor structure of ESES. A Confirmatory Factor Analysis (CFA) also confirmed the fit of the four-factor structure of the scale. The results of the within-group correlation coefficient were obtained to investigate the acceptable test-retest reliability. The results of the correlation between the above-mentioned scale and SEQ-C instrument was also significant (P<0.05). Moreover, ESES and its dimensions had proper reliability over time. The reliability obtained by Cronbach's alpha for all four dimensions of the questionnaire, given the number of items, was higher than 0.5 for each dimension and higher than 0.7 for the whole scale, which was acceptable.

Conclusion: These findings indicate the acceptable validity and reliability of ESES for Isfahan's adolescents, and its validity and reliability should be investigated in broader research on Iranian children and adolescents.

1. Introduction

Self-efficiency refers to an individual's belief in his or her ability to successfully perform and behave to achieve the desired attainments and outcomes. As self-efficiency is an important predictor for performance in a specific domain, the Emotional Self-Efficiency (ESE) can also be a proper predictor of emotional functioning. ESE affects main emotional processes, as well as the consequences associated with adaptive and maladaptive emotional functioning [1]. One of the terms used

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to describe emotional functioning is Emotional Intelligence (EI). The four-dimensional model of EI [2] indicates that EI includes four functions: the correct perception of emotion in yourself and others, using emotions to help thinking and decision-making, understanding the emotion of yourself and others, and effective management of emotions in yourself and others. These steps are the components of the emotional information process, which their relationship becomes more evident when they are more coherent and coordinated. For example, emotion recognition leads to a more basic process, such as emotion perception [3]. This type of EI is called ESE [4]. ESE refers to a set of behavioral readiness and individual tendencies to recognize, process, and organize emotional information. Self-efficacy is the basis of emotional competence for emotional functioning [5, 6]. The quadrilateral model of EI provides an appropriate conceptual and empirical description of adaptive emotional functioning [2, 7]. Regarding EI, it should be noted that emotional functioning-related self-perception includes ESE [1]. Therefore, ESE is only one aspect of trait EI and is not exactly equal to what Petrides and Furnham (2003) describe as trait EI. The Emotional Self-efficiency Scale (ESES) for adults was designed by Kirk in 2008 [1]. This scale is based on the EI model of Mayer et al. [4]. According to Meyer et al.'s model, EI is a combination of assessing emotions in the self and others, expressing emotions, regulating emotions in the self and others, and using emotions to solve problems.

Following Bandura's theorizing [5, 8], we would expect perceived self-efficacy to play an important role in the processing of emotional functioning and expect ESE to contribute to effective processing, understanding, and management of emotional information. So far, empirical research has focused on how children and adolescents manage their emotional experiences. These studies were conducted because people are different greatly not only because they have different skills but also because they are different regarding their perceived capabilities to manage their emotions [9]. This issue is important because it highlights the role of distinct self-efficacy beliefs in managing positive and negative emotions [9], and whether people can successfully perceive emotional information is important. Previous research supported this idea concerning sociability and depression symptoms and changes in self-esteem [8, 10-12]. Additionally, studies have shown that confidence in the ability to control negative emotions is particularly useful to deal with the symptoms of anxiety and depression, which in turn protects adolescents against emotional problems development [13-15].

According to these ideas, some measures of ESE have been prepared for children [13] and adolescents [8]. Using the modified adult version of ESE, Dacre Pool and Qualter measured ESE in adolescents [16]. This research supports the four sub-scales of ESES for adolescents, which are largely independent of cognitive ability. Using this scale in another research, Nowland and Qualter reported that an increase in the adolescents' ESE leads to a better relationship between the adolescent and school and peers [17]. The reliability and validity of the 27-item adolescents ESES have been investigated. By implementing this scale for 192 11 to 13 years old adolescents at the state school of England, Qualter et al. (2015) reported the Cronbach's alpha of 0.87 [18].

As ESE is a complicated process of initiating, avoiding, inhibiting, maintaining, and fluctuating internal feelings or different factors associated with emotions (biological, cognitive, and behavioral processes), and this process acts to realize the adaptability of individuals; therefore, conducting studies in this area is of paramount importance [17, 19, 20]. Considering the importance of the translation and adaptation of psychological tests in different cultures and languages that make it possible to more accurately measure psychological constructs and provide the ground for the formation of the basic literature for common concepts and creation of operational definitions [21, 22], and because the questionnaires need to be localized and their reliability and validity should be determined in the recruited population, and as so far the adolescent version of this scale has not been assessed psychometrically, the necessity of conducting this research is thus recognized. Therefore, the present research was designed and implemented to psychometrically assess the Persian version of ESES for adolescents among students. This research also seeks to answer this question: Does this scale have adequate reliability and validity to measure EI in adolescents?

2. Methods

This study was conducted using a developmental method. The statistical population consisted of all the first-grade high school students of Isfahan city in 2018 (n=59396). A total of 280 students (girls=160 and boys=120, mean age =12.98±1.14 years) were selected. At least, 100 samples are required to make the instrument and investigate its reliability and validity [22]. Kline believes that at least 10 and overall 200 samples are required per variable in the Exploratory Factor Analysis (EFA) [23].On the other hand, the structural equations modeling method was used in this research to investigate the fit of the Confirmatory Factor Analysis

(CFA). Hooman cited Benner and Chu and recommended using the sample size of 10 cases per free parameter (not per variable) in the structural equations model [24]. Because in this study, there were a maximum of 28 free parameters in the proposed model, which was the basis for sample selection, the sample size of 280 cases seems to be sufficient. Therefore, a total of 280 questionnaires were distributed and completed.

The statistical sample was selected using the stratified random sampling method. First, four districts were randomly selected out of the six districts of Isfahan city, and then, one school was randomly selected from each district. Samples in the seventh, eighth, and ninth grades were randomly selected from each class. The inclusion criteria were the informed consent of the children's parents to participate in the research and no history of participating in the self-efficacy and self-confidence training courses.

ESES for adolescents: It is a 27-item scale developed by Qualiter et al. based on the ESES proposed by Kirk et al. [1, 18]. This scale includes four sub-scales: 1. Using and managing one's own emotions (10 items); 2. Identifying and understanding one's own emotions (6 items); 3. Dealing with emotions of others (8 items), and 4. perceiving emotion through facial expressions and body language (3 items). This scale is used in the research on IE and self-efficacy. These items were scored based on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The internal consistency of the items was reported to be 0.87 based on Cronbach's alpha [18]. The validity of the ESES (adolescent form) was also reported by measuring its correlation with the relevant constructs [18]. At first, this scale was translated by researchers, and then, the required modifications were applied by three English language specialists, and finally, the Persian version was formulated and implemented.

Self-Efficacy Questionnaire for Children (SEQ-C): This questionnaire was developed by Muris (2001) based on the self-efficacy questionnaire proposed by Bandura et al. [8, 13]. SEQ-C includes 23 items, including academic self-efficacy, social self-efficacy, and emotional self-efficacy. It measures the subjects' ability in different situations. The social self-efficacy subtest consisted of the first eight items of the questionnaire. It measures the ability to communicate with peers, assertiveness, and social standards achievement. The academic self-efficacy subtest consisted of the second eight items of the questionnaire and measures a feeling of empowerment in managing learning behaviors, having mastery of the course topics, and fulfillment of academic expectations. The subtest of emotional self-efficacy includes the last seven items of the questionnaire and measures one's ability to deal with negative emotions and control them. Muris showed the three-factor structure of the scale in three social, academic, and emotional domains. In order to score the items, a 5-point Likert scale (ranging from 1-5) was used. Score 1 shows the lowest level of self-confidence and score 5 shows the highest level of self-confidence. The reliability of the scale was reported to be good and its internal consistency was calculated to be 0.80. In addition to investigating the convergent and divergent validity of the scale, this study reported the reliability of the whole scale to be 0.70, social self-efficiency to be 0.78, academic self-efficiency to be 0.80, and emotional self-efficiency to be 0.87 [13]. In Iran, the internal consistency of the whole scale and the test-retest reliability of the whole scale were reported to be 0.73 and 0.89, respectively [21].

Data analysis

In the present study, the EFA and CFA were used to measure the validity of this scale by the construct validity method. The concurrent validity was calculated using the Pearson correlation test for SEQ-C [13]. The Intraclass Correlation Coefficient (ICC) was used to investigate the test-retest reliability. Additionally, the Cronbach's alpha coefficient and split-half reliability coefficient were used to determine reliability. All analyses were done using SPSS V. 23 and AMOS v. 22 software.

3. Results

The research sample consisted of 160 girls (Mean age=12.73 years, SD=1.06) and 120 boys (Mean age=13.31 years, SD=1.17). In the group of girls, 53 students (33.12%) were studying in the seventh grade, 53 students (33.12%) in the eighth grade, and 54 students (33.75%) in the ninth grade, and in the group of boys, 40 students (33.33%) were studying in each of the seventh, eighth, and ninth grades.

The response rate of the questionnaires rose to 100%. To perform the EFA, first, the quality of the correlation matrix of scale items, as well as sampling capability were investigated. The value of Bartlett's test of sphericity was equal to 1257.233 ($P<0.001$). The Kaiser-Meyer-Olkin (KMO) coefficient was also equal to 0.732. Therefore, the information contained in the data matrix was significant and the sample size was satisfactory to perform factor analysis.

Using the Principal Component Analysis (PCA) method and orthogonal rotation and based on the results of

Table 1. Factor loadings and the rate of shared similarities between the adolescents - Emotional Self-efficiency Scale (ESES) items

Factor	Questions	Factors and Items	Factor Loadings	Rate of Shared Similarity
1: Using and managing your own emotions	7	When I am in bad conditions, I know how to make myself feel better.	0.74	0.486
	3	When I feel unhappy, I know how to make myself happy again/change my mood.	0.56	0.678
	15	I know how to use a good mood to get good ideas.	0.60	0.591
	25	I know how to behave to come up with good ideas.	0.58	0.592
	12	I know how to change my mood in various conditions and make myself feel happy or sad if needed.	0.59	0.489
	10	When I get stressed, I know how to control my feelings.	0.73	0.555
	19	I know how to make myself feel calm and focused at school if needed.	0.41	0.492
	17	When I feel angry, I can calm myself down.	0.61	0.585
	5	I know how to use positive feelings to be creative in an area.	0.72	0.742
	23	I can be full of energy and motivated when I do sports.	0.47	0.671
2: Identifying and understanding your own emotions	24	I can tell what makes a change in my behavior and feelings.	0.29	0.514
	9	When I am sad, I can tell what has caused it.	0.76	0.553
	1	I can express my feelings when I feel unhappy or angry.	0.61	0.594
	8	I can tell everything when I have a good feeling.	0.58	0.47
	16	I can tell why my feelings change.	0.53	0.566
	4	I am able to express what makes me feel good.	0.63	0.468
3: Dealing with Emotions in Others	6	I know how to make other people feel happy.	0.70	0.531
	21	I know how to help other persons calm down when they are feeling angry	0.64	0.553
	26	I can easily figure out what made the persons feel the way they feel.	0.69	0.427
	27	I can reduce someone's concerns and invite her/him to think positively when his/her pet has gone missing or he/she has lost someone.	0.70	0.513
	13	I can tell what makes other people sad.	0.66	0.629
	2	I know how to make someone happy when he/she feels unhappy.	0.69	0.598
	20	I can tell why other persons' feelings are changing.	0.64	0.561
	11	I can guess when someone feels a good feeling.	0.44	0.598
4: Perceiving emotion through facial expressions and body language	22	I can express the feelings I show on my face.	0.47	0.654
	18	I can figure out how other people feel from their body changes and moves.	0.88	0.55
	14	I can figure out how I feel from my body behaviors and feedbacks.	0.57	0.706

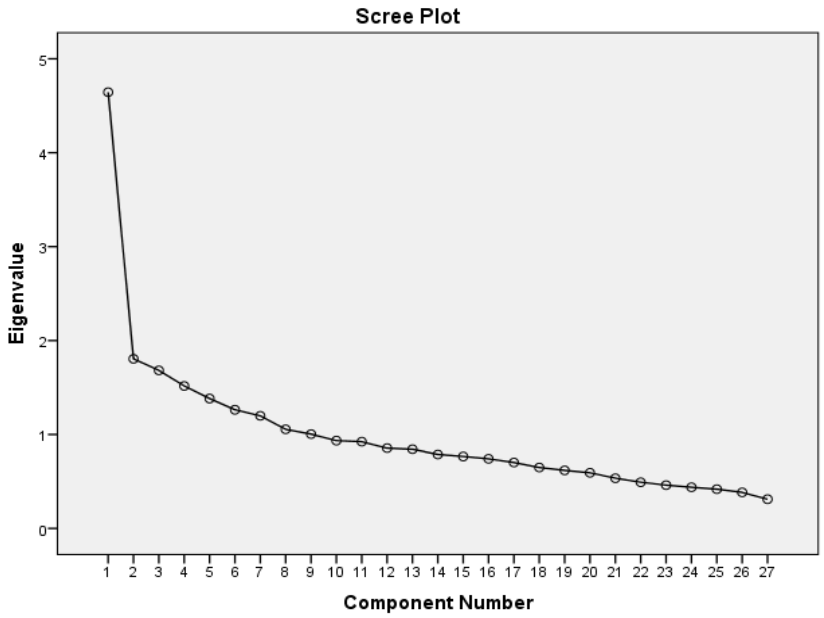

Figure 1. The scree plot related to the factors extracted in the adolescents- Emotional Self-Efficiency Scale (ESES)

EFA, four factors with an eigenvalue greater than one were extracted, which totally explain 75.25% of the variance of the whole scale. The first, second, third and fourth factor explains 24.38%, 20.52%, 19.85%, and 10.5% of the scale variance, respectively, and the eigenvalue in each of the factors was respectively confirmed to be 4.64, 1.82, 1.1, and 1.11. The results of the EFA and the items of the adolescents-ESES are presented in Table 1 and the scree plot is shown in Figure 1.

As shown in Table 1, the optimal and factor loadings greater than 0.3 were obtained in all items. Only in item 24, the factor loading was 0.29, which is very close to 0.3; thus, this item also remained in the questionnaire. In addition, the rate of shared similarities or correlation between items was appropriate. This correlation was obtained to be between 0.427 and 0.742.

The CFA was used to investigate the obtained factor structure. Based on the results of EFA, the measurement model of adolescents-ESES indicated that the fit indices are good in the adolescents-ESES measurement model such that the relative Chi-square index was equal to 1.889, indicating the acceptable status of the model. In addition, the value of TLI and CFI adaptive indicators was higher than 0.9, and the PCFI indicator was higher than 0.5. The value of RMSEA, which is also proposed as the most important indicator of the total fit, was equal to 0.052, indicating that the adolescents-ESE model has generally a suitable fit. Table 2 presents the results of CFA.

As presented in Table 2, in order to investigate the second-order CFA in the measurement model, all of the four factors of the adolescents- ESES had high factor loadings or correlation with the whole scale (P<0.001). Additionally, all factor loadings were significant in the measurement model of the scale (P<0.001), and the significance level indicates the suitability of the factor loading in all items. Also, the factor loading was higher than 0.3 in all items. Figure 2 shows the CFA model.

In order to investigate the convergent or concurrent validity of the adolescents-ESES, its correlation with SEQ-C was investigated in the research sample. The obtained results showed that the SEQ-C and all of its dimensions had a significant relationship with the adolescents-ESES (P<0.001). The correlation coefficient of the two scales (questionnaires) in emotional self-efficacy, academic self-efficacy, social self-efficacy, and total self-efficacy dimensions was 0.673, 0.512, 0.683, and 0.633, respectively.

To investigate the test-retest reliability of the adolescents-ESES and its dimensions, the ICC was used. The obtained results showed that the within-group correlation coefficient of the questionnaire obtained from two times implementation of the adolescents-ESE test was equal to 0.714, which was in the reliability interval of 0.554-816 and was higher than the acceptable value, indicating the acceptable and excellent reliability of the adolescents-ESES. These results showed that the questionnaire has suitable test-retest reliability. In addition, the within-group correlation in the "using and managing your own emotions" dimension was equal to 0.676,

Table 2. Results of confirmatory factor analysis for main factors and items of the adolescents - Emotional Self-Efficiency Scale

Factor	Standard Estimation	Critical Value	Sig.	Items	Standard Estimation	Critical Value	Sig.
Using and managing your own emotions	0.741			3	0.359	-	-
				5	0.479	6.651	0.001
				7	0.571	6.986	0.001
				10	0.455	6.006	0.001
				12	0.454	5.855	0.001
				15	0.476	6.098	0.001
				17	0.399	5.402	0.001
				19	0.331	5.554	0.001
				23	0.342	6.588	0.001
				25	0.529	6.32	0.001
Identifying and understanding your own emotions	0.857	5.068	0.001	1	0.378	-	-
				4	0.456	5.276	0.001
				8	0.32	4.038	0.001
				9	0.437	5.122	0.001
				16	0.495	2.255	0.001
				24	0.313	4.382	0.001
Dealing with emotions in others	0.737	4.054	0.001	2	0.362	-	-
				6	0.485	5.189	0.001
				11	0.319	5.288	0.001
				13	0.463	5.514	0.001
				20	0.432	4.849	0.001
				21	0.463	5.054	0.001
				26	0.496	5.25	0.001
				27	0.505	5.304	0.001
Perceiving emotion through facial expressions and body language	1.19	9.888	0.001	14	0.306	5.351	0.001
				18	0.394	-	-
				22	0.439	6.465	0.001

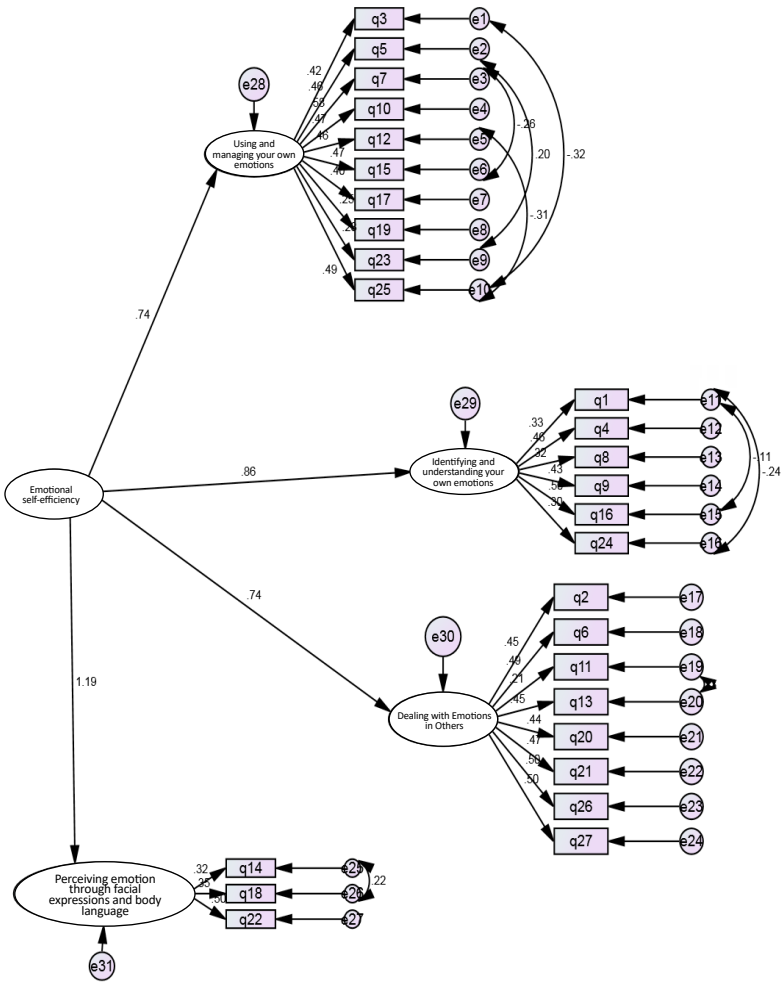

Figure 2. Confirmatory Factor Analysis (CFA) Model

which was in the confidence interval of 0.494-0.792 and showed that the test-retest reliability of this dimension was suitable and acceptable. The within-group correlation coefficient of "identifying and understanding your own emotions", "dealing with emotions in others", and "perceiving emotion through facial expressions and body language" dimensions were equal to 0.828, 0.767, and 0.953 in the confidence interval of 0.731-0.889, 0.636-0.85, and 0.926-0.97, respectively. All three coefficients were at a 95% confidence interval, indicating that the test-retest reliability was also acceptable in these dimensions and had suitable test-retest reliability for the whole ESES and its dimensions.

Table 3 represents the reliability of the instrument used in this research obtained by Cronbach's alpha coefficient and split-half coefficient.

Table 3. Reliability coefficients of the adolescents- Emotional Self-Efficiency Scale (ESES) and its dimensions

Scale	Number of Items	Cronbach's Alpha	Split-half Coefficient
Emotional self-efficiency	27	0.805	0.716
Using and managing your own emotions	10	0.754	0.661
Identifying and understanding your own emotions	6	0.715	0.628
Dealing with emotions in others	8	0.758	0.668
Perceiving emotion through facial expressions and body language	3	0.455	0.348

As can be observed in Table 3, the obtained reliabilities using Cronbach's alpha for all of the four dimensions of the adolescents-ESE given the number of items were higher than 0.5 in each dimension and higher than 0.7 for the whole scale. These values are acceptable.

4. Discussion

In the present study, the KMO measure of sampling adequacy for data analysis indicated the appropriate size of the sample (0.732). The value of Bartlett's test of sphericity for four factors indicates that the required conditions for factor analysis are met. The results from EFA of the four-dimensional structure of the scale totally explained 75.25% of the whole variance of the variables. The items with factor loading less than 50% were removed. Overall, the results from CFA confirmed the four-factor structure of the adolescents-ESES. This finding is in agreement with those obtained by Dacre Pool and Qualter [16] and Qualter et al. [18]. The reliability of the scale was calculated using Cronbach's alpha coefficient method (0.814) and test-retest within a two-week interval (0.83). These coefficients indicated the desirable reliability of the adolescents-ESES in an Iranian sample. These results are in agreement with those obtained by other studies [17-19, 22].

The other objective of this research was to determine the concurrent (convergent) validity of the adolescents-ESES. In this vein, we can refer to the significant positive correlation (r=0.633) of this scale with Muris's SEQ-C. According to these results, the adolescents-ESES had desirable convergent validity. This finding is in agreement with that of the research by Khodayarifard et al. (2014). They investigated the psychometric properties of the Persian version of ESES for adults. Their results showed that the ESES has acceptable reliability and validity for adults. Self-efficiency is a component that plays a very important role in managing emotions and ESE plays a key role in four components: using and managing your own emotions, identifying and understanding your own emotions, dealing with emotions in others, and perceiving emotion through facial expressions and body language, and can be effective in directing anger, happiness, worry, satisfaction, fear, anxiety, curiosity, and other emotions. The positive psychological structures seem to have an important function in managing emotions [15]. Social cognition theorists have focused on the role of self-efficacy beliefs in emotion-related self-regulation to emphasize the productive and creative nature of the mind. ESE is a complicated process of initiating, avoiding, inhibiting, maintaining, and fluctuating internal feelings or different factors associated with emotions (biological, cognitive, and behavioral processes). This process acts to realize the adaptability of individuals [17, 20]. It is also associated with adolescent aggression [25]. Emotions play a very important role in interpersonal relationships, and emotion regulation helps individuals adapt to these relationships in most situations. Healthy emotional regulation is the cornerstone of mental health and adaptability, while the unhealthy regulation of emotions plays a key role in many psychological disorders [17]. On the other hand, it has been shown that adolescents' self-regulation is associated with the students' academic achievement [26]. It seems that the ESE has been less investigated for adolescents. Therefore, this questionnaire can be a great help to understand and percept the ESE and emotions regulation in adolescents and discover emotions in adolescents and consequently its effect on other related variables using other components.

The present research is confined to the students' population of Isfahan city. This instrument is required to be investigated for students of other cities of Iran with different socio-cultural backgrounds so that the results can be generalized further.

As this research investigated the psychometric properties of the Persian version of the ESES (for young adolescents), it is suggested that various populations be investigated more broadly to obtain more accurate findings concerning the scale reliability and validity and remove the research limitations and its factor structure is investigated again. Moreover, it is suggested that this study be conducted on adolescents with different levels of EI.

5. Conclusion

The results from this research showed that the adolescents-ESES in the sample consisted of adolescent students of Isfahan city has acceptable reliability and validity, and can be used in studies on adolescents and children of Isfahan city, but its reliability and validity should be investigated in broader research studies, including Iranian children and adolescents.

Ethical Considerations

Compliance with ethical guidelines

Ethical considerations, including obtaining the full consent of the participants and maintaining data confidentiality, were strictly observed. Also, the Ethics Committee of Islamic Azad University, Isfahan branch approved this study (Code: 23821402922057).

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Authors' contributions

Design study, reading, and approval of the final version of manuscript: Zohreh Meshkati; Data analysis and data collection, preparation of the primary version of the manuscript: Zahra Mohammadi.

Conflict of interest

The authors declared no conflict of interest.

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