



# Psychometric Properties of the Persian Version of Resilience Scale in Iranian Adolescents

Pantea Ahadianfard <sup>1</sup>, Razieh Javaherirenani<sup>1</sup>, Zahra Maghami-Sharif <sup>2</sup>, Hojjatollah Farahani <sup>3</sup> and Asma Aghebati <sup>1,\*</sup>

<sup>1</sup>Department of Clinical Psychology, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, Iran

<sup>2</sup>Florida State University, Department of Psychology, Tallahassee, FL, US

<sup>3</sup>Department of Clinical Psychology, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran

\*Corresponding author: Department of Clinical Psychology, School of Behavioral Sciences and Mental Health (Tehran Institute of Psychiatry), Iran University of Medical Sciences, Tehran, Iran. Email: asma.aghebati@gmail.com

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## Abstract

**Background:** According to the Wagnild model, resilience as an initial trait is critical in overcoming challenges and protecting well-being.

**Objectives:** This study aimed to investigate the psychometric properties and cultural adaptation of the Persian version of the Resilience Scale (RS), including validity, reliability, and factor analysis in the adolescent population.

**Methods:** The scale was translated and adapted using a standard method and a pilot study after receiving permission from the original author. This cross-sectional study investigated the face, content, criterion validity, construct validity, and reliability of RS. A sample of 419 adolescents aged 12 - 18 was selected by convenient sampling in Tehran, Iran. The subjects completed the RS, Beck Depression Inventory-II, and Mental Health Continuum Questionnaire.

**Results:** The quantitative and qualitative analyses of scale items and modifying them based on the feedback of participants and experts showed that face and content validity was acceptable. Factor analysis confirmed the two-factor structure described by Wagnild and Young, including personal competence and acceptance of self and life. Moreover, Cronbach's alpha exceeded 0.84, showing the scale has strong internal consistency. There was also a significant negative correlation between RS and the total score of the depression inventory. At the same time, there was a positive correlation between RS and the score of the mental health questionnaire, indicating acceptable criterion validity.

**Conclusions:** Persian version of the RS can be considered a valid and reliable instrument to measure resilience in adolescent populations. Therefore, researchers and mental health professionals can use it for therapeutic, preventive, and research purposes.

**Keywords:** Adolescent, Psychological Resilience, Psychometrics, Reliability, Validity

## 1. Background

Adolescence is a critical period when the individual becomes independent and self-sufficient (1). Significant changes occur in their physical, mental, and social development, resulting in many difficulties (2). Adolescents react differently when they encounter adverse events (3). These experiences can lead to short-term and long-term consequences, such as defects in identity formation, autonomy, and acceptance of new social roles and responsibilities (4), or suffering disorders, such as anxiety, depression, conduct disorder, and misbehaviors (e.g., self-injury) (5, 6). Although among individuals 10 - 19 years old, one in seven has a mental disorder (7), the challenges of a demanding world are well suited to resilient youth. The ability to adapt well to challenges and setbacks, which

is named resilience, is essential for successful personal growth (8). Assessing resilience problems during adolescence is very important because it can help prevent future problems and provide prompt solutions.

Resilience is a multidimensional construct defined differently as a trait, process, or consequence without any universal consensus on resilience definition (9). According to the Wagnild model, resilience is an initial trait critical in overcoming challenges and protecting wellbeing. It is an intrinsic trait strengthened or impaired by interacting with the environment (10). Due to the persistent nature of this trait, resilient people tend to manifest adaptive behaviors and bounce back after challenges, leading to better mental outcomes (11) and positive emotions even under stressful conditions (12).

A qualitative study by Wagnild and Young led to the developing of the Resilience Scale (RS). A sample of older women with successful adaptations to traumatic events was interviewed in their study. Out of 25 RS items, two factors of personal competence and acceptance of life and self were derived (13). Translated into many languages, the RS has shown good psychometric characteristics in Chinese, Dutch, Swedish, Spanish, Italian, and Japanese. In addition, different factor structures of RS have been demonstrated for populations and languages from distinct countries (14-18). Wagnild and Yang reported the strong internal consistency reliability of the RS ( $r = 0.91$ ) and a range of test-retest reliability of 0.67 - 0.84 (13). The Cronbach's alpha in the French, Swedish, and Spanish versions was reported in the range of 0.73 - 0.77 (16, 18, 19), and the Finnish, Italian, Japanese, Dutch, and Portuguese versions, between 0.80 - 0.90 (17, 20, 21). Moreover, the results of evaluating test-retest correlation in Swedish, Italian, Japanese, and Dutch studies confirmed the stability of RS over time ( $0.90 > r > 0.78$ ) (15-17, 22).

Various resilient measurements have been developed to assess resilience in response to the increasing demand for reliable assessment. Researchers determined that RS is the best instrument for studying resilience in adolescents because, based on evidence, they can benefit from acceptable psychometric properties. Furthermore, it can be used in a diverse range of age and ethnic groups, and research showed that when all 25 components load on one overall resilience factor, RS has the best model fit (23). Simultaneous investigation of results validity in different studies demonstrates that resilience scores have significant positive correlations with life satisfaction, social support, ego-resilience, and family supervision, and negative correlations with depressive symptoms, general health symptoms, individual disability, and psychological violence, indicating the significance of resilience as an influential factor in maintaining and promoting mental health (13, 24, 25).

The authors found no similar research about the psychometric properties of RS in teenagers in the middle east, except for one research about institutionalized adolescents. Nourian et al. (26) investigated RS in an Iranian sample and concentrated on a special group of adolescents who were homeless or badly cared for and lived in boarding centers. The criterion validity has not been reported in this research, and two factors of RS were not approved. Therefore, cultural adaptation and determination of face, content, criterion, construct validity, and RS reliability, especially among adolescents, can help mental health professionals access valid and reliable measurements. Furthermore, the Iranian version of RS can help researchers for cross-cultural studies and clinicians in assess-

ing resilience and designing intervention plans.

## 2. Objectives

This study investigated the psychometric properties and cultural adaptation of the Persian version of RS in Iranian adolescents. The examined properties included face validity, content validity, construct validity, reliability, and criterion validity. It is hypothesized that the Persian version of RS will have the proper face, content, and criterion validity as well as reliability, and its items will load into two factors suggested by Wagnild and Yang.

## 3. Methods

### 3.1. Participants

The participants were 419 adolescents aged 12 - 18 years who were selected using a convenient sampling method in Tehran, Iran, in 2021. The number of participants needed for factorial analysis was estimated to be 15 per item (27). However, Monroe states that 100 - 200 subjects are adequate for factorial analysis (28). Accordingly, given that RS comprised 25 items, a sample size of at least 375 participants was needed. The inclusion criteria were being 12 - 18 years old, and parents were required to sign the consent form. Questions that were left unanswered or incomplete were excluded.

### 3.2. Study Design

This cross-sectional study involved translation and cultural adaptation, as well as determining the reliability and validity of RS.

#### 3.2.1. Forward Translation and Backward Translation

First, the original author (Dr. Wagnild) granted permission for research. Four bilingual translators used a forward-backward translation method to prepare the Persian version of RS (29).

#### 3.2.2. Pilot Study

A sample of 30 girls and 30 boys aged 12 - 18 were assessed using the pre-final questionnaire using convenient sampling. After changing the unclear items, the RS was prepared for the main administration.

### 3.2.3. Face Validity

Regarding face validity, the researchers conducted a qualitative face-to-face interview with ten adolescents to express their views about the level of difficulty, inconsistency, irrelevance, item ambiguity, or biases in the meanings of words and phrases. The items of RS were edited based on their comments. In order to assess quantitative face validity, as suggested in the literature (30), 20 adolescents were asked to comment on all items within the questionnaire based on a 5-item Likert scale.

### 3.2.4. Content Validity

Regarding content validity, ten university professors (three Ph.D. in counseling, four Ph.D. in clinical psychology, two Ph.D. in statistics, and one Ph.D. in educational psychology) were requested to comment. Some adjustments were made after taking the advice of professionals. To determine quantitative content validity, as suggested in the literature (31), 20 experts were asked to respond to all items as “necessary,” “not necessary but useful,” and “no need.”

## 3.3. Measurement Instruments

### 3.3.1. Resilience Scale

The RS was designed by Wagnild and Young (1990) from a qualitative research study (32). The scale consists of 25 items on a 7-point Likert scale from 1 (disagree) to 7 (agree). Seventeen items related to the “Personal Competence” subscale assess self-reliance, independence, determination, mastery, and resourcefulness. Eight items associated with the “Acceptance of Self and Life” subscale assess the adaptability, balance, flexibility, and balanced perspective of life. The study designated a permissible score range of 25 - 175. Higher scores depicted more resilience. Scores were considered high if they exceeded 147; mid-range scores were 121 - 146, while scores below 121 were considered low (10, 13). In various studies, RS showed adequate reliability and validity in adolescents (33). The alpha coefficient was 0.91, which makes it highly reliable. In addition, a 0.99 correlation has been reported between factors’ scores and overall RS. Test-retest reliability ranged from 0.67 to 0.84 (13).

### 3.3.2. Beck Depression Inventory-II

The Beck Depression Inventory-II (BDI-II) was designed by Beck (1996) and is the new version of BDI-IA (34). This inventory assesses the presence and severity of depression symptoms as described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; 1994). It is a multi-choice self-assessment questionnaire with 21 items and one of the most popular psychometric tests to measure signs and symptoms associated with depression in individuals above 12 years old. These signs can include hopelessness, irritability, guilt, physical symptoms, and weight

loss. Each item is divided into four degrees based on intensity, and scores range from 0 - 3. The total scores are 0 - 63. Scores of 0 - 13, 14 - 19, 20 - 28, and 29 - 63 represent minimum, mild, moderate, and severe depression, respectively. Its construct validity has been demonstrated, and it can distinguish between patients who are depressed and those who are not. The alpha coefficient of BDI-II was 0.92 for outpatients and 0.93 for college students. Test-retest reliability had a correlation of 0.93, which was considered significant. The inter-correlations of the 21 items were calculated and indicated the factorial validity (34). The Persian version of this scale has a high internal consistency with a Cronbach’s alpha of 0.86, and the test-retest reliability was 0.73, which was acceptable (35).

### 3.3.3. Mental Health Continuum-Short Form

The Mental Health Continuum-Short Form (MHC-SF) was designed by Keyes. The short version of the Mental Health Continuum includes 14 questions and three components based on Likert’s six-choice spectrum. The MHC-SF measures emotional, psychological, and social wellbeing (36). The minimum score is 14, and the maximum score is 84. Scores between 28 and 56 indicate moderate mental health levels and scores above 56 indicate high mental health levels. The MHC-SF has an acceptable internal consistency with a Cronbach’s alpha above 80 (36). The test re-test reliability for three months was 0.68, and the average for the nine-month was 0.65 (37). With its concept of three factors (emotional, psychological, and social wellbeing), the factorial structure was preserved throughout the two scales (long and short) (38). This questionnaire’s reliability has been reported to be 0.88 in Iran (39).

## 3.4. Statistical Analysis

The data analysis was carried out with R studio software 4.1.2 version at an alpha of 0.5. There was not any outlier data in this study. For assessing criterion validity, the BDI and MHC-SF were applied. Due to the positive and negative relationships between mental health and depression with resilience, the BDI-II and MHC-SF were chosen. These scales are suitable for measuring the psychological characteristics of Iranian adolescents and have acceptable validity and reliability. Moreover, in the psychometrics studies about MHC-SF, it has been mentioned that this scale has a divergent validity with BDI-II (13, 40).

A clinical psychologist trained several psychologists with bachelor’s and master’s degrees in research to collect all questionnaires in this study. They explained the purpose of the study to participants, received consent from participants and their parents, and answered their questions. To assess internal reliability and construct validity, Cronbach’s alpha correlation and confirmatory factor

analysis were used. Criterion validity was calculated using Pearson's correlation of the total scores of MHC-SF and BDI-II with RS.

Quantitative face validity was assessed based on the percentage of participants who thought each item was important or extremely important. A total score was determined. Since all 25 items on this scale had a score over 1.5, regarded as statistically significant, they were all acceptable (41). Quantitative content validity was calculated using the content validity ratio (CVR) formula and compared to the numbers in the Lawshe table. The minimum CVR value was 0.62 (42, 43). Since all items exceeded this value, no items were eliminated. The total content validity index (CVI) was also calculated (0.87), which was acceptable (44).

#### 4. Results

In the present study, participants were 419 adolescents aged 12 - 18 years with a mean age of 15.9 (SD = 2.15) years. There were 72 males (17.2%) and 347 females (82.8%). All the participants were single. Table 1 displays the mean and standard deviation of RS scores. There were no significant differences between genders in the total score of RS and its subscales (Table 1).

##### 4.1. Factor Analysis

Since the creators of this scale and related studies have obtained the two primary factors of RS, this research also used factor analysis to confirm the items' homogeneity in content and the underlying dimensions. Table 2 summarizes the factor loading obtained per item in RS. Several fitness characteristics are used to evaluate factor analysis models. Table 3 displays goodness-of-fit characteristics obtained for RS. Average variance extracted (AVE) and composite reliability (CR) were calculated to assess the convergent validity and reliability of the scale after conducting a confirmatory factor analysis. The results indicated that the AVE of personal competence and acceptance of self and life were 0.74 and 0.62, respectively, which exceeded the threshold AVE of > 0.50 (45). Composite reliability coefficients in the present study were reported as 0.84 for personal competence and 0.85 for acceptance of self and life. Based on the CR threshold of 0.70 (46), every variable in this research was reliable and feasible. In the obtained model (Figure 1), similar to the original model, there were two factors. The first PE factor denotes personal competence, and the second is SLA, representing acceptance of self and life.

##### 4.2. Reliability

Cronbach's alpha was calculated to determine the internal consistency reliability of the RS. The Cronbach's alpha exceeded 0.84 for the overall scale, 0.79 for personal competence, and 0.72 for acceptance of self and life. It was greater than the acceptable cut-off value of 0.70 (47) and showed that the scale had strong internal consistency. Test-retest reliability after two weeks was 0.80, 0.73, and 0.70 for overall, Personal competence and acceptance of self and life, respectively. Omega was 0.82 for the total score, 0.79 for personal competence, and 0.71 for acceptance of self and life.

##### 4.3. Criterion Validity

The current study used the BDI-II and MHC-SF scales to determine concurrent and divergent validity (Table 4), indicating a significantly negative correlation between this scale's total score and its subscales and the total score of BDI-II while showing a positive and significant correlation with the total score of the MHC-SF. These results indicated that RS had an acceptable criterion validity.

#### 5. Discussion

Adolescence is a critical transitional period associated with multiple challenges and stressful situations. Resilience is a significant component of successfully navigating this period. Therefore, the purpose of the present study was to investigate the psychometric properties of the Persian version of RS for the Iranian adolescent population to establish a reliable and valid tool to assess resilience. The results showed acceptable psychometric properties, including face, content, criterion, construct validity, and internal consistency.

The quantitative and qualitative analysis indicated that the Persian version of the scale had an appropriate face and content validity. Chinese, Dutch, Swedish, Spanish, Italian, and Japanese versions of RS also were reported to have good face validity (13-18). It means that across different languages, the reviewers of RS agreed that it measures what it should.

Confirmatory factor analysis confirmed that the Persian version of the scale was loaded into two main factors, including "personal competence" and "acceptance of self and life," which is in line with the psychometric properties that Wagnild and Young proposed (13) and were similar to the Spanish sample (18). However, there is some inconsistent evidence in the previous literature. For example, the two-factor model was not confirmed in the Russian sample (48). Moreover, the Haitian Creole and Swedish versions

**Table 1.** Mean, Standard Deviation, and *t*-Test Results <sup>a</sup>

Scale	Gender, Mean ± SD		<i>t</i> -Test t (df), P-Value
	Female	Male	
Resilience scale	131.62 (19.19)	130.43 (15.54)	0.495 (417), 0.621
Personal competence	82.14 (11.76)	80.83 (10.50)	0.873 (417), 0.383
Acceptance of Self and Life	49.48 (9.17)	49.59 (7.18)	-0.098 (417), 0.922

<sup>a</sup> P < 0.001**Table 2.** Factor Loading Obtained Per Item in The Resilience Scale

Items	English/Persian	Personal Competence	Acceptance of Self and Life
1	When I make plans, I follow through with them	0.37	
2	I usually manage one way or another	0.46	
3	I can manage myself more than anyone else	0.56	
4	Keeping interested in things is important to me	0.44	
5	I can be on my own if I have to	0.36	
6	I feel proud that I have accomplished things in my life	0.30	
7	I usually take things in stride		0.40
8	I am friends with myself		0.55
9	I feel that I can handle many things at a time	0.58	
10	I am determined	0.60	
11	I seldom wonder what the point of it all is		0.18
12	I take things one day at a time		0.45
13	I can get through difficult times because I have experienced difficulties	0.54	
14	I have self-discipline	0.39	
15	I stay interested in things	0.51	
16	I can usually find something to laugh about		0.40
17	My belief in myself gets me through hard times	0.68	
18	In an emergency, I am someone people generally can rely on	0.40	
19	I can usually look at a situation in several ways	0.50	
20	Sometimes I make myself do things whether I want to or not	0.18	
21	My life has meaning		0.47
22	I do not dwell on things that I cannot do anything about		0.23
23	When I am in a difficult situation, I can usually find my way out of it		0.61
24	I have enough energy to do what I have to do		0.59
25	It is okay if there are people who do not like me		0.31

**Table 3.** Fit Indices of the Resilience Scale

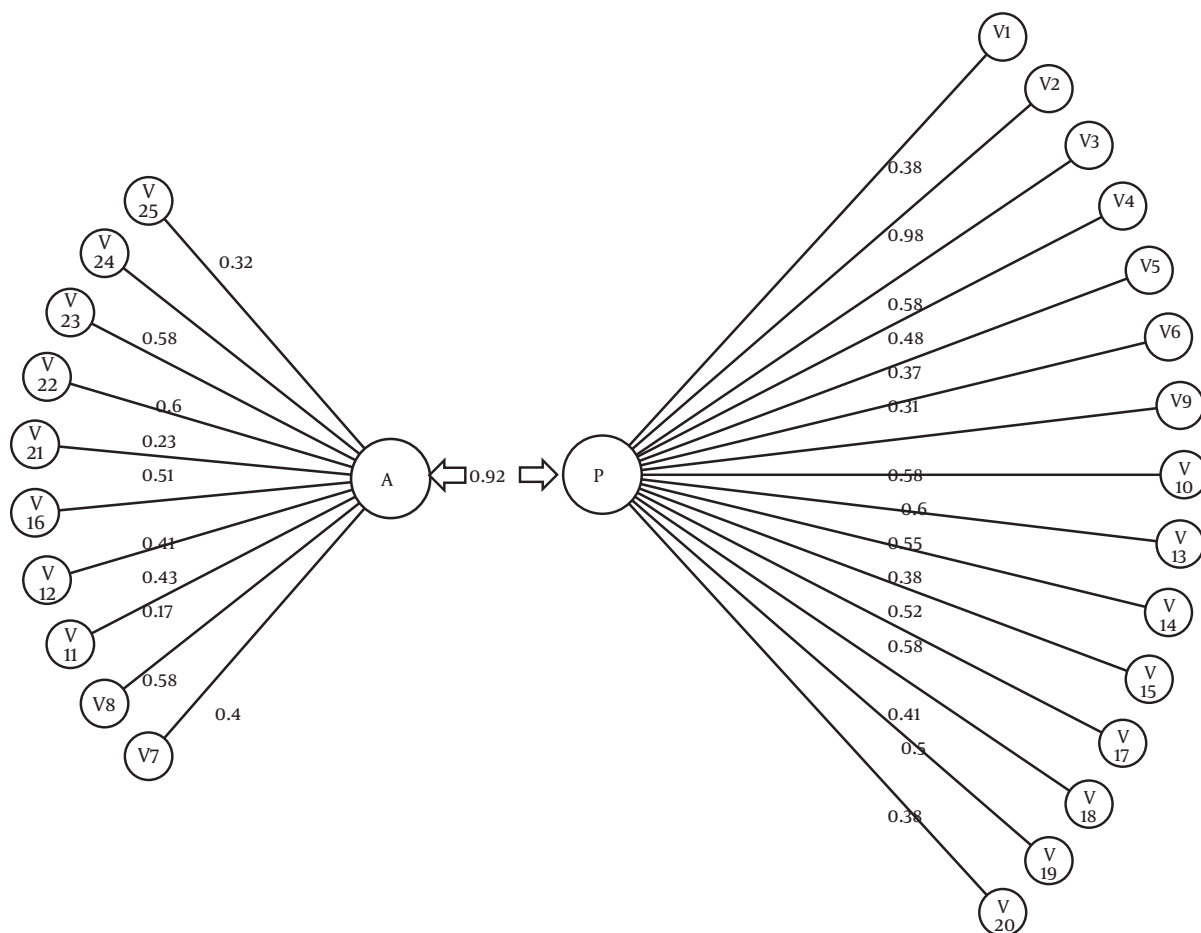
Fit Indices	$\chi^2$	DF	$\chi^2/df$	SRMR	GFI	IFI	CFI	AGFI	NNFI	NFI	RMSEA
RS	396.925	274	1.44	0.061	0.962	0.97	0.97	0.955	0.967	0.91	0.033

**Table 4.** Resilience Scale Criterion Validity<sup>a</sup>.

Scales	Correlations Between RS and Other Scales		
	Personal Competence	Acceptance of Self and Life	Total
BDI-II	-0.284	-0.389	-0.362
MHC-SF	0.508	0.528	0.567

Abbreviations: MHC-SF: mental health continuum short form, BDI-II: Beck Depression Inventory-II.

<sup>a</sup> P < 0.001



**Figure 1.** Diagram of the standardized coefficient of resilience scale's two-factor structure path

yielded a 5-factor model in line with the RS's initial structure suggested by scale developers (16, 19). The Portuguese model confirmed a three-factor model (20), while six factors were observed in Japanese, Italian, and Dutch studies (15, 17, 22). However, Japanese and Dutch studies also found two-factor loadings. As a result, the researchers of the Dutch study eliminated the six-factor model and confirmed Wagnild and Young's two-factor model for their results. Cultural/language differences or sample character-

istics can explain these variations, and further research is needed to clarify the structure of these results.

Test-retest, Cronbach's alpha, and omega were used to determine the internal consistency of the questions, and results demonstrated that the questions were internally consistent. The latter finding was congruent with the relevant research results in other languages, such as Japanese, Swedish, Portuguese, Finnish, and Italian (15, 17, 20-22). Moreover, these results are consistent with a study

on Iranian adolescents residing in boarding centers, which showed a high Cronbach's alpha (26). Overall these consistent findings indicate that RS assesses resilience across different cultures and languages and is a reliable scale.

Regarding criterion validity, the Persian version of RS in the present study had a significant positive correlation with MHC-SF, meaning that the individual's mental health correlated with resilience. The findings are consistent with previous studies by Wagnild and Young and their theory regarding the crucial role of resilience in maintaining mental health (6,32). Ferber's meta-analysis also indicated a significant Pearson correlation between resilience and mental health (40). Similar findings were reported in other studies (49, 50). The results of the present study also indicated that RS had a significant negative correlation with BDI-II scores, which means that as resilience increases, depression decreases. These results align with the research of Wagnild and Young and their theory regarding the protective function of resilience against anxiety and depression (13). Girtler et al. (22) also reported a negative correlation between resilience and BDI-II scores in the Italian sample population. Heilemann et al. (18) and Nishi et al. (15) demonstrated significant negative correlations between resilience and depression symptoms in the Spanish and Japanese normal populations. Furthermore, most studies on patient populations corroborate previous findings (48, 50-52). In general, resilience helps adolescents adapt quickly and successfully to stressful or traumatic events, return to a normal or positive state, and protectively affects wellbeing, resulting in lower depression levels and better mental health.

### 5.1. Conclusions

The Persian version of RS showed valid and reliable psychometric properties. Therefore, researchers and mental health professionals can use it for therapeutic, preventive, and research purposes in adolescent populations. Further negative consequences can be avoided when resilience issues are recognized and timely action is taken to improve them. Using a valid tool, researchers can study the factors that affect the resilience of individuals and can contribute significantly to the field.

### 5.2. Limitations and Suggestions

The limitation of the present study was the lack of gender balance among participants. The proportion of males to females was low. Therefore, it is suggested that a study should be conducted with a larger sample size of male adolescents.

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## Footnotes

**Authors' Contribution:** Study concept and design: Pantea Ahadianfard, Asma Aghebati, Razieh Javaherirehani; acquisition of data: Pantea Ahadianfard, Razieh Javaherirehani, Asma Aghebati; statistical analysis: Hojjatollah Farahani; interpretation of data: Asma Aghebati; drafting of the manuscript: Zahra Maghami-Sharif; critical revision of the manuscript for important intellectual comment: Asma Aghebati, Pantea Ahadianfard, Zahra Maghami-Sharif; administrative, technical, and material support: Asma Aghebati.

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**Data Reproducibility:** The dataset presented in the study is available on request from the corresponding author during submission or after its publication. The data are not publicly available due to privacy. The authors' future studies are based on these results.

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