



# The Open Psychology Journal

Content list available at: <https://openpsychologyjournal.com>



## RESEARCH ARTICLE

### Translation and Adaptation of the Posttraumatic Growth Inventory-Short Form into Persian

Hadis Amiri<sup>1</sup>, Maysam Rezapour<sup>2,\*</sup>, Mahmoud Nekoei-Moghadam<sup>1</sup> and Nouzar Nakhaee<sup>3</sup>

<sup>1</sup>Department of Health in Emergency and Disasters, School of Healthcare Management and Medical Information, Kerman University of Medical Sciences, Kerman, Iran

<sup>2</sup>Mazandaran University of Medical Sciences, Amol Faculty of Paramedical Sciences, Sari, Iran

<sup>3</sup>Kerman University of Medical Sciences, Research Center for Health Services Management, Institute of Futures Studies in Health, Kerman, Iran

#### Abstract:

#### Purpose:

Traumatic events and psychological damage are common, and the assessment of the growth in survivors of these events is critical. This study evaluated the psychometric properties of the Persian Posttraumatic Growth Inventory-Short Form (PTGI-SF).

#### Methods:

This study was conducted in five phases: (1) forward and backward translation of the questionnaire based on the WHO protocol, (2) confirmatory factor analysis to assess construct validity with 563 participations (288 women and 275 men), aged 19-84 years (mean: 33.36 years), (3) Cronbach's alpha for internal consistency, (4) correlations with the Persian version of the Duke University Religion Index (DUREL) for assessing criterion-related validity, and (5) measurement of invariance across genders.

#### Results:

Confirmatory factor analysis supported the five-factor model consisting of relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. All the dimensions of the PTGI-SF were moderately associated with the Persian version of the DUREL. The internal reliability of the subscales and full scale of the PTGI-SF were acceptable to satisfactory, and the configural, metric, and scalar invariance was found across genders.

#### Conclusion:

The Persian version of PTGI-SF is an acceptable, valid, and reliable tool for measuring posttraumatic growth in Iran.

**Keywords:** Post traumatic growth inventory, Short-form, Persian adaptation, Traumatic events, Confirmatory factor analysis, Questionnaire.

#### Article History

Received: May 12, 2020

Revised: August 02, 2020

Accepted: September 19, 2020

## 1. INTRODUCTION

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), exposure to the threat of death, sexual violence or serious injury is called a traumatic event, which can be direct or indirect [1]. Using the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria, the prevalence of lifetime traumatic event exposure among US adults has been estimated to be roughly 90% [2], including disasters, chronic illnesses, vehicle acci-

dents, and loss of family members. These events exert different psychological effects on the exposed people, including negative impacts such as post traumatic stress disorder (PTSD), as well as positive effects. The positive effects are defined as post traumatic growth (PTG) [3]. About 30-90% of people who have experienced a traumatic event in their life have reported at least one form of PTG [4]. The different traumatic events have a different impact on PTG; people with severe trauma report more benefits and chronic events could be very different from acute events in their psychological effects [5].

In general, PTG refers to positive psychological changes and greater growth than the pre-crisis level of performance,

\* Address correspondence to this author at Mazandaran University of Medical Sciences, Amol Faculty of Paramedical Sciences, Sari, Iran; Tel: +989112204822; E-mail: [maysam.rezapour@gmail.com](mailto:maysam.rezapour@gmail.com)

which, through cognitive reconstruction, makes the person adapt to the new reality [6]. Positive changes following injury occur in five aspects: "Recognizing Personal Strength" occurs when a person feels more confident. "Finding Unknown Possibilities and Opportunities" is experienced when people find a new way of life that would not be available if they did not experience a traumatic event in life. The domain of "Experiencing Positive Changes in Relationships" that shows a sense of kindness or closeness to others. "Appreciation of life" seems to have more appreciation for each new day of life. And finally, the scope of "Spiritual and Existential Change" understands personal growth that has a much better understanding of spiritual issues [7 - 9].

The positive experiences of traumatic events lead to a more productive life, having more life satisfaction in comparison with the pre-traumatic life [10 - 12].

The measurement of PTG is the most important task in the field of growth due to capturing the phenomenon of positive effect. Subsequently, comprehensive and validated tools have been proposed to measure and compare PTG [13]. Different scales have been designed to measure PTG, such as the Stress-Related Growth Scale (SRGS) [14], the Benefit Finding Scale (BFS) [15], and the post traumatic Growth Inventory (PTGI) [5].

Among them, the PTGI scale is the most commonly used tool in the literature. It consists of 21 self-report questions on five subscales [5]. A short form of the PTGI (PTGI-SF) was developed by Cann *et al.* [16] and presents a reasonably short measure, and its use has recently expanded [17]. The PTGI-SF is employed as it saves time and energy and is easy to use by people who are willing to participate in studies but are very busy. The need for short measures is undeniable where research involves people who have little physical energy (such as patients), there is limited data collection time and conditions for filling in questionnaires (e.g., in wars), and there is little time and response rate (e.g., for people who are deeply involved in crises), and when multiple questionnaires should be completed. The approved PTGI-SF contains 10 items, including five subscales, which are also available in the original version (Appendix) [16].

So far, the PTGI-SF has been translated into several languages, including Spanish [17], Italian [18], Chilean [19], Arabic [20], and Urdu [21].

Iran has experienced many disasters and is still at risk of disasters [22]. This country is geographically located in a region most prone to natural disasters and with a history of repeated earthquakes, droughts, floods, hurricanes, epidemics, and fires [23]. In addition, there have been numerous man-made disasters in the country, such as the eight-year Iraq war imposed on Iran with a high prevalence of catastrophic chemical attacks (acid throwing) [24, 25], the PLASCO Tower collapse [26], road traffic injuries [27], *etc.* Besides, there are many chronic diseases such as diabetes and cardiovascular diseases with a high prevalence among Iranian adults [28]. The expression of PTG can be dependent on cultural conditions [29]. Weiss and Berger [30] also emphasized the importance of monitoring post traumatic growth in different languages and

cultural environments to guide practitioners in helping those at risk of traumatic events. The culture of Iran may increase one's ability to cope with traumatic events, with patience in the face of suffering and crisis highlighted in the Iranian historical literature, especially in poetry [31]. Additionally, the Islamic beliefs of the majority of Iranian people adapted from the Islamic holy books emphasize the opportunities for growth after being challenged with a crisis [32]. Therefore, this study evaluated the psychometric properties of the Persian-translated post traumatic Growth Inventory-Short Form (PTGI-SF) in Iran.

## 2. METHODS

### 2.1. Materials

The process of translations and back translation of the original version of the questionnaire was done based on the World Health Organization guideline [33]. To examine the comprehensibility of questions, a cognitive interview was carried out on 10 literate people and all the questionnaire items were comprehensible. At the end of the adaptation process, the final version was distributed to the target sample for psychometric evaluation. Students were one of our sample respondents. The developers of the questionnaire considered the student population to be suitable for evaluating the reliability and validity of the questionnaire [5]. Furthermore, it was also given to cancer patients who have been shown to be a suitable sample for validation of the short form of PTGI [16]. The questionnaire package included demographic questions (age, sex, level of education, type of event, and time interval of the event so far) and PTGI-SF and Duke University Religion Index (DUREL) [34]. It was expected that religiosity would be positively related to the PTGI-SF score [35]. At the end of the questionnaire, participants were asked if they had experienced at least one of the most important negative events during the last 5 years. These events included the death of a family member or close friend, severe occupational stress in the family such as loss of work, parents' divorce or separation and strong disagreements between them, a dangerous disease of one of the first-degree relatives, such as cancer, serious accidents, and negative academic events such as failure in an important exam.

### 2.2. Participants

The data were collected in Kerman, Iran, from April to September 2018. The participants were 563 people from two sample groups, including college students (466 individuals) and cancer patients (97 patients). The questionnaire developers conducted the validation study on college students [5], and cancer patients were enrolled according to the study by Cann *et al.* [16], which introduced the short form of PTGI. The mean (SD) age of the participants was 33.4 (12.9) years, ranging from 18 to 84 years, and 51.2% (n = 288) of them were female. The level of educational attainment in the sample was as follows: 4.3% were illiterate, 3.7% had elementary-level education, 4.1% had secondary-level education, 71.8% were graduated from college/university, and for 16.2%, the level of education was unknown. The most stressful events experienced were the death of a family member or close friend (77.3%),

severe occupational stress in a family such as being fired from work (30.9%), parents' divorce or separation and strong disagreements between them (9.4%), their disease or that of one of the first-degree relatives, in case of dangerous disease such as cancer (34.5%), serious accidents (20.4%), and severe negative academic events such as failure in an important exam (23.4%). As some people had experienced more than one stressful event, the total sum is >100.0%. All the participants gave written informed consent.

### 2.3. Measures

#### 2.3.1. The Post traumatic Growth Inventory-Short Form (PTGI-SF):

The brief version of PTGI developed by Cann et al. [16] includes 10 self-report questions on five subscales (relating to others, new possibilities, personal strength, spiritual change, and appreciation of life). Each subscale has two items. The items included in the PTGI-SF are given in Appendix 1. A six-point Likert scale for scoring the subscales (0: I did not experience this change as a result of my crisis; 1: I experienced this change to a very small degree as a result of my crisis; 2: I experienced this change to a small degree as a result of my crisis; 3: I experienced this change to a moderate degree as a result of my crisis; 4: I experienced this change to a great degree as a result of my crisis; 5: I experienced this change to a very great degree as a result of my crisis.) and in the study by Cann et al. [16], the overall internal reliability of the questionnaire was 90.

#### 2.3.2. The Persian Version of the Duke University Religion Index (DUREL)

Koenig and Büsing [34] developed the DUREL that is a five-item measure of religiosity. It consists of three subscales of organizational religiosity (1 item), non-organizational religiosity (1 item), and intrinsic religiosity (three items). A six-point Likert scale is used for scoring organizational religiosity and non-organizational religiosity, while a five-point Likert scale is utilized for scoring the three intrinsic religiosities.

The questions are as follows: The first question is "How often do you attend mosque, or other religious meetings?" The answers are: 1 = Never, 2 = Once a year or less, 3 = Several times a year, 4 = Several times a month, 5 = Once a week, and 6 = More than once a week, to measure the organizational dimension. The second question is: "How much time do you spend on private religious activities, such as prayer, meditation, or Bible study?" Answers range from 1 (rarely or never) to 6

(more than once a day) to measure the non-organizational dimension. The third three sentences that measure intrinsic religiosity are: "I experience divine presence in my life", "My religious beliefs are what really lies behind all my approaches to life", and "I try very hard to convert my religion to other things in life". The internal consistency in the study by Koenig and Büsing [34] is estimated (Cronbach's alpha's = 0.78–0.91).

The scale was translated and adapted into Persian by Safari et al. [36]. Since previous studies reported a significant relationship between religion and posttraumatic growth [35], the DUREL questionnaire, with validity and reliability confirmed in the Persian version, was employed to assess concurrent validity with the PTGI-SF questionnaire.

### 2.4. Procedure

The methods applied to validate the PTGI-SF can be divided into several steps: standard forward, backward translation according to the World Health Organization (WHO) guideline [37], evaluating construct and concurrent validity, calculating internal consistency, and assessing the measurement invariance of the factorial structure across genders. The Ethics Committee of Kerman University of Medical Sciences approved the protocol of the study (approval no. IR.KMU.REC.1398.404).

### 2.5. Statistical Analysis

Confirmatory factor analysis (CFA) was performed to evaluate the construct validity of the PTGI-SF in the Iranian context. Before conducting CFA, we assessed the skewness and kurtosis of all the observed indicators to see whether they met the multivariate normality assumption (skewness values ranging from -1.40 to -0.49, and kurtosis from -0.78 to 1.67) (Table 1). The maximum likelihood (ML) estimator was used for estimating parameters. The model fitness was assessed using a combination of fit indices, including the comparative fit index (CFI), the Tucker Lewis index (TLI), the standardized root mean square residual (SRMR), the root mean square error of approximation (RMSEA), and the relative chi-square that is the ratio of chi-square to the degrees of freedom. RMSEA values less than 0.05 are considered as good and values between 0.05 and 0.08 are acceptable, and CFIs and TLIs should be over 0.9 for a good fit [38]. The reliability of the total PTGI-SF and dimensions was evaluated by internal consistency (Cronbach's alpha). Moreover, the concurrent validity was evaluated by the correlations between the PTGI-SF dimensions and the Persian version of the DUREL.

**Table 1. Correlations between questions and descriptive statistics (mean, standard deviation, skewness, and kurtosis) of the questions.**

	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10
q1	1.00	0.42	0.42	0.24	0.17	0.41	0.39	0.28	0.31	0.20
q2		1.00	0.52	0.41	0.32	0.50	0.51	0.43	0.37	0.32
q3			1.00	0.41	0.26	0.57	0.57	0.36	0.46	0.21
q4				1.00	0.39	0.33	0.36	0.62	0.28	0.44
q5					1.00	0.34	0.31	0.41	0.30	0.41

(Table 1) contd....

q6						1.00	0.57	0.33	0.42	0.28
q7							1.00	0.45	0.54	0.35
q8								1.00	0.35	0.48
q9									1.00	0.39
q10										1.00
Mean	3.55	4.18	3.97	3.88	3.62	3.72	3.74	3.67	3.75	3.30
SD	1.15	1.01	1.13	1.04	1.15	1.18	1.11	1.11	1.12	1.29
Skewness	-0.73	-1.40	-1.10	-1.01	-0.80	-0.75	-0.88	-0.72	-0.87	-0.49
Kurtosis	-0.30	1.67	0.44	0.74	-0.03	-0.32	0.16	-0.01	0.09	-0.78

**Table 2. Internal consistency (Cronbach's alpha) of PTGI-SF dimensions and correlations between it and the Persian version of the DUREL.**

Dimensions	á	DUREL
Relating to others (D1)	0.578	0.39**
New possibilities (D2)	0.712	0.23**
Personal strength (D3)	0.703	0.30**
Spiritual change (D4)	0.76	0.45**
Appreciation of life (D5)	0.588	0.24**
Total PTGI scale	0.861	0.43**

\*\*p < .01.

**Table 3. Fit indices for invariance tests of the five-factor structure between PTGI-SF dimensions across genders.**

	$\chi^2$	df	$\Delta\chi^2$	df	P-value	CFI	$\Delta CFI$	RMSEA	$\Delta RMSEA$	TLI
<b>Gender (Male, Female)</b>										
<b>Configural</b>	136.6	40				.974		.051		.941
<b>Metric</b>	143.0	50	6.4	10	0.780	.975	0.001	.045	-0.006	.955
<b>Scalar</b>	161.4	65	18.4	15	0.242	.974	-0.001	.040	-0.005	.964

After confirming that the PTGI-SF has a five-factor structure in Iran, we conducted the multigroup confirmatory factor analysis (MGCFA) to examine whether the understanding and measurement of PTGI-SF dimensions are invariant across gender. We followed a recommended sequence of steps for invariance testing: (1) configural invariance, (2) metric invariance, and (3) scalar invariance. The configural invariance model tests whether the factorial structure is the same across the gender; thus, none of the estimated parameters are constrained to be invariant across the gender. This model is a reference model to compare with the metric invariance model. In the metric invariance model, in addition to configural invariance, the factor loadings of questions (items) are constrained to be equal for males and females. When the metric invariance is established, it indicates that the magnitude and direction of the relationship between each question and the underlying dimensions are statistically the same for males and females. Finally, in the scalar invariance model, in addition to configural and metric invariance, the item intercepts are constrained to be invariant across gender. This model is compared with the metric invariance model. Scalar invariance is necessary for comparing structural parameters such as factor means and the relationships of a factor with other constructs.

Nested models (i.e., the next-most-restrictive model) were compared using the change in  $\chi^2$  ( $\Delta\chi^2$ ), change in CFI ( $\Delta CFI$ ), change in TLI ( $\Delta TLI$ ), and change in RMSEA ( $\Delta RMSEA$ ) values. The non-significant  $\Delta\chi^2$  (P-value >0.05),  $\Delta CFI < 0.01$  (Cheung & Rensvold, 2002),  $\Delta TLI < 0.01$ , and  $\Delta RMSEA < 0.015$  indicate the establishment of invariance in that step [39]. Mplus 7.4 [40] was used for the statistical analyses of the data.

**3. RESULTS**

The correlations between the questions in the range of 0.17 to 0.57 and the descriptive statistics of the scale, including means, standard deviations, skewness, and kurtosis, are presented in Table 1. The CFA confirmed the five factors (Figure 1) with all fit indices, indicating an adequate fit (chi-square=72.17 on 25 degrees of freedom, CFI=0.981, TLI=0.955, RMSEA=0.055, and SRMR=0.029). The factor loadings ranged from 0.57 to 0.82. Inter-correlations between the dimensions were significant and high (range between .54 and .91). The PTGI-SF shows a reliability coefficient of .86 for all the items. The reliabilities of the dimensions ranged between 0.57 for relating to others (D1) to 0.76 for spiritual change (D4) (Table 2).

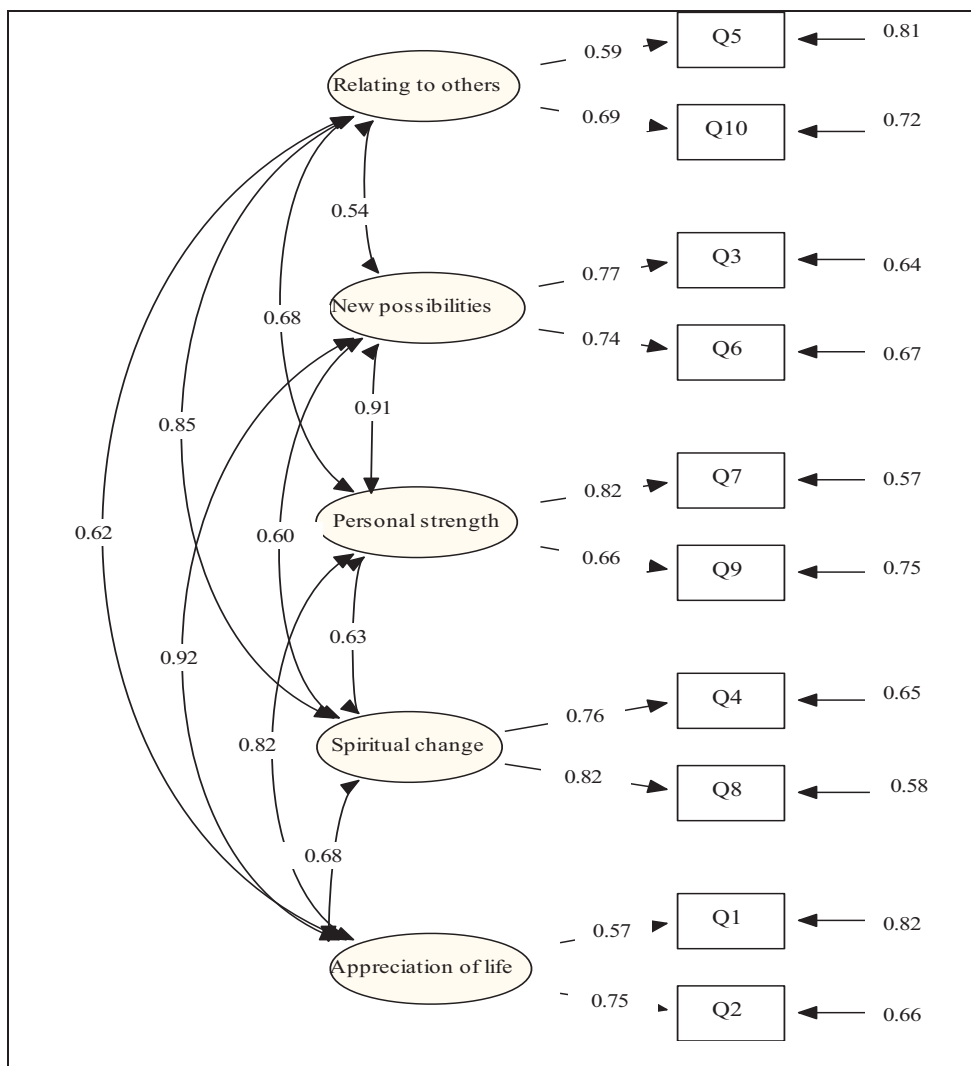


Fig. (1). Factor loadings from CFA of PTGI-SF.

In addition, Table 2 presents the correlations between PTGI-SF dimensions and the Persian version of the DUREL. All the scale dimensions were moderately associated with DUREL. The non-significant  $\Delta\chi^2$  and very small changes in CFI, TLI, and RMSEA for each succeeding invariance model showed the establishment of measurement invariance for gender in three levels of configural, metric, and scalar (Table 3).  $\Delta CFI$  was uniformly  $<.01$  and  $\Delta RMSEA$  was uniformly  $<.05$  for every level of invariance across genders.

4. DISCUSSION

As Cann et al. [16] demonstrated, in critical situations where individuals are unable to respond due to time and energy restriction, the PTGI-SF form can be employed. Weiss and Berger reported that PTG monitoring in linguistic and cultural settings is necessary for guiding practitioners to accompany people exposed to stressful events [30]. Therefore, the need for such a questionnaire in the Iranian research literature is well understood, and the present study found that the Persian version of the PTGI-SH questionnaire has acceptable

psychometric properties, considering the results of CFA, model fits, measurement invariance, and Cronbach’s alpha.

CFA confirmed five factors, and all the goodness-of-fit indices were acceptable and approved the satisfactory model fit [41]. The outcome of this result is similar to the original questionnaire [16], in which the number of factors is five. This factor structure coincides with the study by Tedeschi and Calhoun [5] and is in line with the findings of other studies that have performed CFA for PTGI-SF [18 - 20, 42]. The results also showed that the item factor loading of all the items was higher than the minimum 0.50, and this was a convergent validity confirmation [43]. Therefore, inter-correlations between domains were in the range of moderate to strong relationships, and there was almost no multicollinearity, suggesting that the five domains of positive change have acceptable reliability. As shown in Table 2, the Cronbach’s alpha had 10 questions in the acceptable range, although two of the five dimensions were  $<.7$  due to the small number of items (two items) for each field [44]. The overall PTGI-SF score was high, and these findings are comparable to other findings in the

literature [16, 19, 20].

The correlation coefficient of the PTGI and DUREL questionnaire was higher than the minimum acceptable level of 0.4 [45], which was in favor of the concurrent validity of the questionnaire. According to previous studies, there is a significant relationship between religious beliefs and PTGI [35], which also provides evidence to support the idea that religious beliefs are useful in catalyzing the process of PTGI [35, 45].

An important point in the evaluation of construct is to test if the questionnaire yields different results for different backgrounds and groups of people; if this happens, it may be an indication of the measurement of bias [46]. Establishing the measurement invariance implies the equivalence of rating in the two sexes, indicating that the results of this questionnaire are generalizable across genders [47].

Our study had two limitations. Firstly, we could not use a longitudinal framework, and instead adopted a cross-sectional design. It is, therefore, recommended that future studies evaluate growth at several time points to assess the temporal stability of the measurements [13]. Secondly, 20% of the participants were illiterate; therefore, the researchers had to complete the questionnaires through interviews with them. Given the high risk of natural disasters in Iran, as well as other traumatic events, this tool can be employed as a short-term measure in post-disaster assessments.

**CONCLUSION**

The Persian version of PTGI-SH proved to have good reliability and validity for assessing posttraumatic growth, and can be employed in future research. These results contribute to the growth of research on traumatic growth in diverse cultures and subcultures.

**ETHICS APPROVAL AND CONSENT TO PARTICIPATE**

The Ethics Committee of Kerman University of Medical Sciences approved the protocol of the study (approval no. IR.KMU.REC.1398.404).

**HUMAN AND ANIMAL RIGHTS**

Not applicable.

**CONSENT FOR PUBLICATION**

Informed consent was taken from all the participants when they were enrolled.

**AVAILABILITY OF DATA AND MATERIALS**

Not applicable.

**FUNDING**

None.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest, financial or otherwise.

**ACKNOWLEDGEMENTS**

Declared none.

**APPENDIX**

Appendix 1. Items included in the PTGI-SF (English version)
1. I changed my priorities about what is important in life.
2. I have a greater appreciation for the value of my own life.
3. I am able to do better things with my life.
4. I have a better understanding of spiritual matters
5. I have a greater sense of closeness with others.
6. I established a new path for my life.
7. I know better that I can handle difficulties.
8. I have stronger religious faith.
9. I discovered that I'm stronger than I thought I was.
10. I learned a great deal about how wonderful people are.

**REFERENCES**

[1] Association AP. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub. 2013. [http://dx.doi.org/10.1176/appi.books.9780890425596]

[2] Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *J Trauma Stress* 2013; 26(5): 537-47. [http://dx.doi.org/10.1002/jts.21848] [PMID: 24151000]

[3] Calhoun LG, Tedeschi R. Trauma and transformation: Growing in the aftermath of suffering. USA: Sage Publications 1995.

[4] Slyke J. Post-traumatic Growth. *Combat and Operational Stress Control* 2013; pp. 1-5.

[5] Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: Measuring the positive legacy of trauma. *J Trauma Stress* 1996; 9(3): 455-71. [http://dx.doi.org/10.1002/jts.2490090305] [PMID: 8827649]

[6] Whealin JM, Pitts B, Tsai J, et al. Dynamic interplay between PTSD symptoms and posttraumatic growth in older military veterans. *J Affect Disord* 2020; 269: 185-91. [http://dx.doi.org/10.1016/j.jad.2020.03.020] [PMID: 32339132]

[7] Ajoudani F, Jafarizadeh H, Kazamzadeh J. Social support and posttraumatic growth in Iranian burn survivors: The mediating role of spirituality. *Burns* 2019; 45(3): 732-40. [http://dx.doi.org/10.1016/j.burns.2018.10.013] [PMID: 30655059]

[8] Britton M, et al. Relationships among optimism, pessimism, and posttraumatic growth in the US and Japan: Focusing on varying patterns of perceived stressfulness. *Pers Individ Dif* 2019; 151109513 [http://dx.doi.org/10.1016/j.paid.2019.109513]

[9] Sheridan G, Carr A. Survivors' lived experiences of posttraumatic growth after institutional childhood abuse: An interpretative phenomenological analysis. *Child Abuse Negl* 2020; 103104430 [http://dx.doi.org/10.1016/j.chiabu.2020.104430] [PMID: 32143090]

[10] Rodríguez-Rey R, et al. Are pediatric critical personnel satisfied with their lives? prediction of satisfaction with life from burnout, posttraumatic stress, and posttraumatic growth, and comparison with noncritical pediatric staff. *Pediatric Critical Care Medicine* Society of Critical Care Medicine 2019; 20(3): e160-9.

[11] Tedeschi RG. Violence transformed: Posttraumatic growth in survivors and their societies. *Aggress Violent Behav* 1999; 4(3): 319-41. [http://dx.doi.org/10.1016/S1359-1789(98)00005-6]

[12] Wulandari S, Poerwandari EK, Basri AA. The journey of finding meaning in life: Posttraumatic growth experience in notable holocaust survivors. 2nd International Conference on Intervention and Applied Psychology (ICIAP 2018). [http://dx.doi.org/10.2991/iciap-18.2019.36]

[13] Calhoun LG, Tedeschi RG. Handbook of posttraumatic growth: Research and practice. Routledge 2014. [http://dx.doi.org/10.4324/9781315805597]

[14] Park CL, Cohen LH, Murch RL. Assessment and prediction of stress-related growth. *J Pers* 1996; 64(1): 71-105. [http://dx.doi.org/10.1111/j.1467-6494.1996.tb00815.x] [PMID: 8656319]

- [15] Antoni MH, Lehman JM, Kilbourn KM, et al. Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychol* 2001; 20(1): 20-32. [http://dx.doi.org/10.1037/0278-6133.20.1.20] [PMID: 11199062]
- [16] Cann A, Calhoun LG, Tedeschi RG, et al. A short form of the Posttraumatic Growth Inventory. *Anxiety Stress Coping* 2010; 23(2): 127-37. [http://dx.doi.org/10.1080/10615800903094273] [PMID: 19582640]
- [17] Castro MC, Delgado JB, Alvarado ER, Rovira DP. Spanish adaptation and validation of the posttraumatic growth inventory-short form. *Violence Vict* 2015; 30(5): 756-69. [http://dx.doi.org/10.1891/0886-6708.VV-D-13-00165] [PMID: 26299278]
- [18] Prati G, Pietrantonio L. Italian adaptation and confirmatory factor analysis of the full and the short form of the Posttraumatic Growth Inventory. *J Loss Trauma* 2014; 19(1): 12-22. [http://dx.doi.org/10.1080/15325024.2012.734203]
- [19] Garcia FE, Włodarczyk A. Psychometric properties of the posttraumatic growth inventory-short form among Chilean adults. *J Loss Trauma* 2016; 21(4): 303-14. [http://dx.doi.org/10.1080/15325024.2015.1108788]
- [20] Kaler ME, Erbes CR, Tedeschi RG, Arbisi PA, Polusny MA. Factor structure and concurrent validity of the Posttraumatic Growth Inventory-Short Form among veterans from the Iraq War. *J Trauma Stress* 2011; 24(2): 200-7. [http://dx.doi.org/10.1002/jts.20623] [PMID: 21425192]
- [21] Qandeel S, Kazmi SF, Rana SA. Translation and Adaptation of Posttraumatic Growth Inventory-Short Form (PTGI-SF). *Asian J Res Soc Sci Humanit* 2014; 4(5): 89-96.
- [22] Mohammadinia L, et al. Characteristics and components of children's and adolescents' resilience in disasters in Iran: A qualitative study. *International journal of qualitative studies on health and well-being* 2018; 13(sup1): 1479584. [http://dx.doi.org/10.1080/17482631.2018.1479584]
- [23] Nojavan M, et al. An analysis of the effects of human settlements on increasing and strengthening the natural disasters: A case study of Iran. *Vaghardoost R, Kazemzadeh J, Dahmardehei M, et al. Epidemiology of acid-burns in a major referral hospital in Tehran, Iran. World J Plast Surg* 2017; 6(2): 170-5. [PMID: 28713707]
- [24] Ehsani K. War and Resentment: Critical Reflections on the Legacies of the Iran-Iraq War. *Middle East Crit* 2017; 26(1): 5-24. [http://dx.doi.org/10.1080/19436149.2016.1245530]
- [25] Yarlagadda T, et al. Preliminary modelling of Plasco tower collapse. *Int J High Rise Build* 2018; 7(4): 397-408.
- [26] Shavaleh R, Motevalian SA, Mahdavi N, Haddadi M, Mohaghegh MR, Hamed Z. Epidemiological study of hospitalized road traffic injuries in Iran 2011. *Med J Islam Repub Iran* 2018; 32: 50. [http://dx.doi.org/10.14196/mjiri.32.50] [PMID: 30159301]
- [27] Hajian-Tilaki K, Heidari B, Hajian-Tilaki A. Health related quality of life and its socio-demographic determinants among Iranian elderly people: A population based cross-sectional study. *J Caring Sci* 2017; 6(1): 39-47. [http://dx.doi.org/10.15171/jcs.2017.005] [PMID: 28299296]
- [28] Christiansen DM, et al. Posttraumatic growth: A critical review of problems with the current measurement of the term. *Comprehensive Guide To Post-traumatic Stress Disorder*. Springer 2015; pp. 1797-812. [http://dx.doi.org/10.1007/978-3-319-08613-2\_5-1]
- [29] Weiss T, Berger R. Posttraumatic growth and culturally competent practice: Lessons learned from around the globe. John Wiley & Sons 2010. [http://dx.doi.org/10.1002/9781118270028]
- [30] Esteghamati A, Meysamie A, Khalilzadeh O, et al. Third national Surveillance of Risk Factors of Non-Communicable Diseases (SuRFNCD-2007) in Iran: Methods and results on prevalence of diabetes, hypertension, obesity, central obesity, and dyslipidemia. *BMC Public Health* 2009; 9(1): 167. [http://dx.doi.org/10.1186/1471-2458-9-167] [PMID: 19480675]
- [31] Nikookar HR, Sooteh SHJ. Euthanasia: An Islamic ethical perspective. *Eur Sci J* 2014.
- [32] Organization WH. Process of translation and adaptation of instruments 2010.
- [33] Koenig HG, Büssing A. The Duke University Religion Index (DUREL): A five-item measure for use in epidemiological studies. *Religions (Basel)* 2010; 1(1): 78-85. [http://dx.doi.org/10.3390/rel1010078]
- [34] Shaw A, Joseph S, Linley PA. Religion, spirituality, and posttraumatic growth: A systematic review. *Ment Health Relig Cult* 2005; 8(1): 1-11. [http://dx.doi.org/10.1080/1367467032000157981]
- [35] Saffari M, Zeidi IM, Pakpour AH, Koenig HG. Psychometric properties of the Persian version of the Duke University Religion Index (DUREL): A study on Muslims. *J Relig Health* 2013; 52(2): 631-41. [http://dx.doi.org/10.1007/s10943-012-9639-0] [PMID: 22968303]
- [36] WHO. Process of translation and adaptation of instruments 2007.
- [37] Jackson DL, Gillaspay JA Jr, Purc-Stephenson R. Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychol Methods* 2009; 14(1): 6-23. [http://dx.doi.org/10.1037/a0014694] [PMID: 19271845]
- [38] Meade AW, Johnson EC, Braddy PW. Power and sensitivity of alternative fit indices in tests of measurement invariance. *J Appl Psychol* 2008; 93(3): 568-92. [http://dx.doi.org/10.1037/0021-9010.93.3.568] [PMID: 18457487]
- [39] Muthén L, Muthén B. *Mplus User's Guide* Los Angeles, CA, 1998–2015 Computer software manual <https://www.statmodel.com/download/usersguide/Mplus>
- [40] Hooper D, Coughlan J, Mullen M. Structural equation modelling: Guidelines for determining model fit. *Electron J Bus Res Methods* 2008; 6: 53-60.
- [41] Lamela D, et al. Psychometric properties of the Portuguese version of the posttraumatic growth inventory short form among divorced adults. *Eur J Psychol Assess* 2014. [http://dx.doi.org/10.1027/1015-5759/a000161]
- [42] Hair JF, et al. *Multivariate data analysis* Uppersaddle River, NJ: Pearson Prentice Hall 2006.
- [43] Terwee CB, Bot SD, de Boer MR, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol* 2007; 60(1): 34-42. [http://dx.doi.org/10.1016/j.jclinepi.2006.03.012] [PMID: 17161752]
- [44] McDowell I. *Measuring health: a guide to rating scales and questionnaires*. USA: Oxford University Press 2006. [http://dx.doi.org/10.1093/acprof:oso/9780195165678.001.0001]
- [45] Millsap RE, Everson HT. Methodology review: Statistical approaches for assessing measurement bias. *Appl Psychol Meas* 1993; 17(4): 297-334. [http://dx.doi.org/10.1177/014662169301700401]
- [46] Millsap RE. *Statistical approaches to measurement invariance*. Routledge 2012. [http://dx.doi.org/10.4324/9780203821961]
- [47] Weiss T, Berger R. Posttraumatic growth and culturally competent