

Validity and Reliability Study of the Turkish Version of the Disaster Response Self-Efficacy Scale in Undergraduate Nursing Students

Bennur Koca¹, Özlem Çağan², Aysun Türe³

¹Dokuz Eylül University Health Services Vocational School, Emergency and First Aid Program, İzmir, Turkey
²Eskişehir Osmangazi University Faculty of Health Sciences, Midwifery, Eskişehir, Turkey
³Eskişehir Osmangazi University Faculty of Health Sciences, Nursing, Eskişehir, Turkey

Bennur Koca, Öğr. Gör. Dr.
Özlem Çağan, Dr. Öğr. Üyesi
Aysun Türe, Dr. Öğr. Üyesi

ABSTRACT

Objective: In Turkey, unfortunately, there is no measuring tool to determine nurses' disaster response self-efficacy and thus appropriate tools should be either developed or adapted. This methodological study was designed to determine the validity and reliability of the Turkish version of the "Disaster Response Self-Efficacy Scale (DRSES)".

Materials and Methods: The data were collected through face-to-face interviews. The study sample comprised 271 3rd and 4th year students who attended a Nursing Faculty and accepted to participate in the study. In adapting the scale into Turkish, the translation and back-translation method was used. The Content Validity Index was used to test the content validity, the Exploratory and Confirmatory Factor Analysis was used for determining the construct validity, and Cronbach's alpha value and item total correlation were used to test the reliability.

Results: The content validity index for the Disaster Response Self-Efficacy Scale was 0.99. The Cronbach alpha coefficient was 0.96. For on-site rescue competency, disaster psychological nursing competency, disaster role quality and adaptation competency subscales, it was 0.93. The item-total correlation was positive and high. The factor analysis revealed that the scale had a three-factor structure and that similar items were grouped under the same factors. Confirmatory factor analysis revealed the following values: RMSEA: 0.077, GFI: 0.87, CFI: 0.98, IFI: 0.98, RFI: 0.97, NFI (TLI): 0.97, and χ^2/df : 2.604.

Conclusion: It was concluded that the Turkish version of the Disaster Response Self-Efficacy Scale was a reliable and valid measurement tool that could be used to determine the nursing students' disaster response self-efficacy.

Keywords: Disaster, nursing, self efficacy, validity, reliability

LİSANS HEMŞİRELİĞİ ÖĞRENCİLERİ İÇİN "AFETE MÜDAHALE ÖZ-YETERLİLİK ÖLÇEĞİ" NİN TÜRKÇE FORMUNUN GEÇERLİK VE GÜVENİRLİĞİ

ÖZET

Amaç: Türkiye'de lisans hemşirelerinin afete müdahale öz-yeterliliklerini belirlemeye yönelik bir ölçme aracı bulunmamaktadır ve uygun araçların geliştirilmesi veya uyarlanması gerekmektedir. Metodolojik nitelikteki bu araştırma, "Afete Müdahale Öz-yeterlilik Ölçeği'nin (AMÖYÖ) Türkçe Geçerlik ve Güvenirliğini saptamak amacıyla planlanmış bir araştırmadır.

Yöntem: Verilerek yüz yüze görüşülerek toplanmıştır. Araştırmanın örneklemini Hemşirelik Fakültesinde 3. ve 4. sınıfta öğrenim gören, araştırmaya katılmayı kabul eden 271 öğrenci oluşturmuştur. Ölçeğin Türkçe uyarlamasında çeviri geri çeviri yöntemi kullanılmıştır. İçerik geçerliğini test etmek için kapsam geçerlik indeksi, yapı geçerliğini belirlemek için açımlayıcı ve doğrulayıcı faktör analizi, güvenirliğini test edebilmek için Cronbach alfa değeri, madde toplam korelasyonu kullanılmıştır.

Bulgular: AMÖYÖ için kapsam geçerlik indeksi 0,99'dur. Ölçeğin tamamının Cronbach alfa katsayısı 0,96, yerinde kurtarma yeterliliği, afet psikolojik hemşirelik yeterliliği, afet rolü kalitesi ve adaptasyon yeterliliği boyutlarının 0,93 olarak saptanmış, madde-toplam korelasyonu pozitif ve yüksek bulunmuştur. Faktör analizi ölçeğin üç faktörlü bir yapıya sahip olduğunu ve benzer maddelerin aynı faktörler altında toplandığını göstermiştir. DFA Uyum indekslerinden RMSEA 0,077, GFI 0,87, CFI 0,98, IFI 0,98, RFI 0,97, NFI (TLI) 0,97 ve χ^2/df bölümü ise 2,604 olarak belirlenmiştir.

Sonuç: AMÖYÖ'nin Türkçe versiyonunun lisans hemşirelik öğrencilerinin afete müdahale öz-yeterliliklerini belirlemede kullanılabilecek, güvenilir ve geçerli bir ölçme aracı olduğu sonucuna varılmıştır.

Anahtar sözcükler: Afet, hemşirelik, öz-yeterlilik, geçerlik, güvenirlilik

Correspondence:

Dr. Öğr. Üyesi Özlem Çağan
Eskişehir Osmangazi University Faculty of Health Sciences, Midwifery, Eskişehir, Turkey
Phone: +90 530 227 02 55
E-mail: ozlemozcagan@gmail.com

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Disasters affected 108 million people worldwide in 2015. Over the past 10 years, 1.9 billion people have been affected by disasters (1). Emergency Events Database 313 between the years 1923–2016 in Turkey were found to be (51.1% natural, technological disasters 48.9%) (2). Disasters are an important public health problem in Turkey as in all over the world due to high rates of morbidity and mortality and serious economic losses they cause (3).

Disaster preparedness and rapid interventions of nurses who constitute the largest group of health personnel are addressed as a very important issue for the effective management of disasters (4).

Nurses in many countries today are held responsible for getting prepared for disasters likely to occur and for acquiring knowledge and skills necessary to deal with disasters (5). Disaster management which was initially considered as the responsibility of public health nurses, emergency nurses or nurses working in the army; is today perceived as a priority issue that should be learned by nurses working in all areas (6).

Nurses' receiving disaster nursing education can yield positive results such as a reduction in mortality rates, improvement of individual health and reduction in disaster-related costs (7–9).

One of the points that the International Council of Nurses (ICN) focuses on in disaster recovery is the improvement of the qualifications of disaster nursing. The ICN emphasizes that all nurses whatever area they are specialized in (clinicians, educators, researchers, managers) should have the best competency to plan and perform disaster care, and that they should be equipped with adequate knowledge and skills in disaster preparedness and interventions (10). Within this context, the ICN prepared a framework regarding the competencies of disaster nursing and called on all nurses to demonstrate such competencies (11). Another organization that also highlighted that nurses all over the world should have at least minimum levels of knowledge and skills to be prepared for and to intervene in disasters and events leading to impacts of a disaster was the International Nursing Coalition for Mass Casualty Education (INCMCE) (12).

Although there exist measurement tools used to determine competencies related to disaster response in the world literature in recent years (13, 14), our search for

measurement tools used to determine undergraduate nurses' disaster response self-efficacy in Turkey demonstrated a gap.

This study was designed to determine the validity and reliability of the Turkish version of the "Disaster Response Self-Efficacy Scale (DRSES)".

Materials and Methods

Design and participants

This descriptive study was conducted between May 25, 2018, and May 30, 2018, in a Nursing Faculty, a province located in the western part of Turkey. The researchers collected the study data through face-to-face interviews.

The study population comprised 571 3rd-year nursing students and 398 4th-year nursing students who received disaster education in a Nursing Faculty. In scale studies, it is recommended that the sample size should be five- or ten-fold the number of the items in the scale. Higher rates are also acceptable (15). The scale whose validity and reliability study was conducted consists of 19 items and three subscales. The items are rated on a five-point Likert scale. Based on this information, 271 3rd and 4th year students who agreed to participate in the study were included in the sample.

Instruments

The study data were collected using the Sociodemographic Characteristics Questionnaire and the Turkish version of the "Disaster Response Self-Efficacy Scale (DRSES)".

Sociodemographic characteristics questionnaire

the questionnaire has five items questioning the participating students' age, gender and year at school, whether they have received disaster education and whether they have worked in a disaster-related unit.

The Disaster Response Self-Efficacy Scale (DRSES)

The scale developed by Hong-Yan, Rui-Xue, Qing-Ling in 2017 is composed of 19 items and three subscales. The items are rated on a five-point Likert scale ranging from 1 to 4 (1 = No confidence at all, 2 = Basically no confidence, 3 = Little confidence, 4 = Basically confident, 5 = Complete confidence). A higher rating was representative of a higher self-efficacy score in disaster response. While the Cronbach's alpha value for the overall scale is 0.91, it is 0.89 for the on-site rescue competency subscale, 0.86 for the disaster psychological nursing competency subscale and 0.83 for the disaster role quality and adaptation competency subscale (14).

Data analysis

To analyze the study data, of the statistical programs, the SPSS 16.0 and LISREL 8.7 were used. Descriptive statistics were performed using numbers, percentages and mean values. For the validity of the scale, the Content Validity Index (CVI), EFA and CFA, and Finite Population Correction were used. For the reliability of the scale, the Cronbach's alpha value, split-half method, item-total score and item-subscale total score correlation, and floor and ceiling effect were used. Whether the scale had a response bias was assessed using the Hotelling T² test. The scale was assessed whether it had a response bias using the Hotelling T² test. The level of significance was accepted as 0.05.

Ethical approval

Written permission was obtained from Hong-Yan Li via e-mail to conduct the adaptation study of the Disaster Response Self-Efficacy Scale into Turkish and to determine its validity and reliability. Ethical approval was obtained from the Ethics Committee of the University Institute of Medical Sciences (Approval no. 12-25). An informed consent form was read to all participants and their verbal and written consents were received in the data collection process. The data obtained would be published for scientific purposes without using the names of the participants.

Results

Descriptive characteristics of the sample

The mean age of the participating students was 22.27±1.21. Of them, 64.6% (n=175) were third year students, 35.4% (n=96) were fourth year students, 76.4% (n=207) were female. While all of them received disaster education, none of them worked in a disaster area.

Validity

The translation and back-translation method was used to test the validity of the language. The scale was translated into Turkish by five people who had a good command of English and Turkish, and agreed to participate in the study. Then the Turkish text developed by them was translated back to English. Language validity was established by revising the inappropriate statements.

In order to establish the content validity, after the opinions of eight health professionals who were experts in the field of disaster nursing (public health, internal medicine, members of the pediatrics department, emergency service nurses) regarding the items were obtained; the content validity index (CVI) was calculated to range between

0.88 and 1.00 using the Davis technique (1992) and the mean CVI was calculated as 0.99 (16).

To determine the construct validity of the scale, the EFA and CFA were performed. EFA revealed that the Kaiser-Meyer-Olkin (KMO) coefficient was 0.94, and the result of Bartlett's test was $X^2=4273.669$, $p=0.000$. The results of the factor analysis demonstrated that there were three factors whose eigenvalue was greater than 1. The eigenvalues of the factors and the variance rates they explained are shown in Table 1. The three subscales altogether account for 70.222% of the total variance.

Table 1. Factor loads of the three extracted factor after varimax rotation (n= 271)

Items	Factor loads		
	On-site rescue competency	Disaster psychological nursing competency	Disaster role quality and adaptation competency
M1	0.61		
M2	0.58		
M3	0.69		
M4	0.43		
M5	0.64		
M6	0.76		
M7	0.71		
M8	0.74		
M9	0.77		
M10	0.76		
M11	0.77		
M12		0.55	
M13		0.40	
M14		0.41	
M15		0.42	
M16			0.73
M17			0.84
M18			0.85
M19			0.86
Variance Explained (%)	55.812	8.544	5.87
Total Variance Explained (%)	70.222		
Eigenvalue	10.604	1.623	1.115
KMO	0.940		
Bartlett X ² (p)	4273.669(0.000)		
* Exploratory factor analysis			

The χ^2/df was 2.604. Of the fit indices, RMSEA was 0.077, GFI was 0.87, CFI was 0.98, IFI was 0.98, RFI was 0.97 and NFI (TLI) was 0.97 (Table 2) (Figure 1).

Table 2. Model fit indices

	χ^2	df	χ^2/df	RMSEA	GFI	CFI	IFI	RFI	NFI
Three-Factor Model	377.70	145	2.604	0.077	0.87	0.98	0.98	0.97	0.97

*Exploratory factor analysis

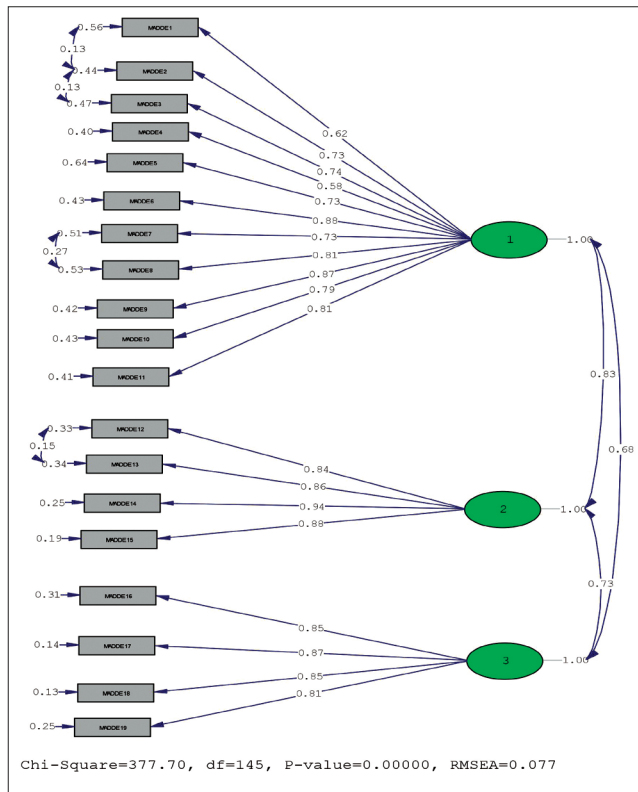


Figure 1.

After the CFA, it was determined that factor loadings ranged between 0.58 and 0.88 for the first subscale, between 0.84 and 0.94 for the second subscale, and between 0.81 and 0.87 for the third subscale. While the mean score of the third year nursing students obtained from the overall scale was 60.42 ± 14.61 , it was 66.72 ± 12.91 for the fourth year students. The difference between the mean scores obtained by the third and fourth-year students was statistically significant ($p=0.000$) (Table 3).

Reliability

The Cronbach’s alpha coefficient for the overall scale was 0.96. The Cronbach’s alpha coefficient of the first, second, third subscale of the scale was 0.93. After the Split-Half analysis, the Cronbach’s alpha coefficient was 0.92 for the

Table 3. Comparison of mean scores of the participating students according to their years at school (finite population correction) (n = 271)

Year at school	n	Mean+SD*	t p
3rd year	175	60.42+14.61	3.537 0.000
4th year	96	66.72+12.91	

*SD (Standard deviation)

first half and 0.94 for the second half. The Spearman-Brown coefficient was 0.88. The Guttman Split-Half reliability coefficient was 0.88. The correlation coefficient between the two halves was 0.78. The mean score for the overall scale was 62.65 ± 14.33 . The floor and ceiling effects were lower than 15.0%. The Hotelling T² value was 355.106 and $p=0.000$. As a result of the analysis, it was determined that there was no response bias on the scale.

The correlation between the mean scores for the overall scale and its items ranged from 0.67 to 0.83, for on-site rescue competency subscale and its items ranged from 0.70 to 0.83, for the disaster psychological nursing competency subscale score and its items ranged from 0.90 to 0.91 and for disaster role quality and adaptation competency subscale and its items ranged from 0.89 to 0.93 (Table 4).

Table 4. Item-scale total score and item-sub-dimension total score correlations (n = 271)

Sub-Dimensions	Items	Item-Scale Total Score Correlation (r)*	Item-Sub-dimension Total Score Correlation (r)*
On-site rescue competency	M1	0.67	0.70
	M2	0.75	0.79
	M3	0.73	0.78
	M4	0.71	0.71
	M5	0.66	0.73
	M6	0.77	0.83
	M7	0.72	0.76
	M8	0.75	0.79
	M9	0.77	0.81
	M10	0.76	0.76
	M11	0.77	0.79
Disaster psychological nursing competency	M12	0.78	0.91
	M13	0.77	0.91
	M14	0.79	0.91
	M15	0.83	0.89
Disaster role quality and adaptation competency	M16	0.77	0.89
	M17	0.74	0.93
	M18	0.76	0.93
	M19	0.67	0.90

* p<.001

Discussion

Validity

The “back-translation” method was used for the language validity of the scale. The CVI value for the DRSES was 0.99. Considering the criteria of 0.80 CVI suggested by researchers, the CVI which was 0.99 for all the items of the scale showed that there was a consensus between the experts (17, 18).

In this study, the results of the CVI showed that the scale items were suitable for Turkish culture and that the scale correctly measured the content and had the content validity. The CVI was calculated as 0.91 in a study conducted by Hong-Yan, Rui-Xue, Qing-Ling in 2017, which was consistent with the result of the present study. In studies on cultural adaptation of scales, it has been reported that it is necessary to perform the factor analysis, a method used to integrate variables related to each other (19, 20). The EFA was used to evaluate the construct validity of the DRSES. One of the most frequently used methods in determining the number of factors in the EFA is the Kaiser-Guttman criterion. In this method, factors whose eigenvalue is greater than 1 are taken into account. In the present study, three factors were determined to have the eigenvalue greater than 1. Based on the results of the reliability analysis, the EFA was conducted for 19 items. In the EFA performed to determine the construct validity of the DRSES, it was first investigated whether there were significant correlation values between the items by analyzing the correlation matrix, and was found that there were significant correlations indicating that the factor analysis could be performed. Then, KMO and Barlett’s Sphericity tests were performed to measure the adequacy of the item sample. In the literature, it is stated that the KMO value greater than 0.80 indicates that the sample size is adequate for the factor analysis, whereas the Barlett’s Sphericity test value less than 0.05 indicates that the data show the multivariate normal distribution and that factor analysis can be continued (19). In the present study, the KMO value of 0.94 and the Barlett test significance value of $p=0.000$ indicated that the data were adequate for the factor analysis of the data and that the analysis could be continued. The results of the factor analysis in the present study indicate that the 19 item DRSES measures a three-dimensional construct. In the literature, it is emphasized that the variance explained should be between 40.0% and 60.0%, and that the higher the total variance is, the stronger the construct validity of the scale (21). In the scale, three sub-dimensions account for 70.22% of the total variance. This result shows that the scale has a very strong factor structure.

In the original study, the three sub-dimensions accounted for 59.21% of the total variance (14). These results support the construct validity of the scale. Factor loads of the scale are greater than 0.30. In the literature, it is emphasized that the minimum factor load should be ≥ 0.30 and the items with smaller values should be excluded from the scale (18, 22). The factor loadings of the EFA determined in the present study were consistent with those determined in the original study (14). These results show that the scale has a strong factor structure.

In scale adaptations, in order to test a hypothesis on the structure of the items, to compare the factor structure of the adapted scale with the factor structure of the original scale and to observe similarities and differences, construct validity is assessed using the CFA (20, 23). The CFA is a method based on the evaluation of fit indices showing the compatibility between the data and construct. If of the CFA fit indices, χ^2/df is less than five, CFI and GFI are greater than 0.90, and RMSEA is less than 0.08, this indicates that the fit is acceptable (24, 25). It is recommended that the item factor loadings in the CFA should be higher than 0.30 (19). The results of the CFA demonstrated that the factor loadings of the items of the scale were above 0.30 and of the fit indices, RMSEA was 0.077, GFI was 0.87, CFI was 0.98, IFI was 0.98, RFI was 0.97, NFI (TLI) was 0.97 and χ^2/df was 2.604. The fact that these values were better than the acceptable values shows that the model has a good fit, and confirms that the scale had a three-factor structure. In a study conducted by Hong-Yan, Rui-Xue, Qing-Ling in 2017, of the fit indices, χ^2/df was 2.440, RMSEA was 0.068, NFI was 0.907, CFI was 0.942, IFI was 0.430 and $p < 0.001$, indicating that their results were consistent with those of the present study.

Reliability

The first requirement for a measuring tool to be valid is that it should be reliable. Reliability is the ability of a measurement tool to perform measurements free of errors (26). In order to test the reliability of a scale, the item-total test score correlation and Cronbach’s Alpha internal reliability coefficient are calculated. In item-total score correlations, values 0.40 and above indicate very good discrimination, values between 0.30 and 0.40 indicate good discrimination, and values between 0.20 and 0.30 indicate that the items should be revised. Items with a coefficient lower than 0.20 are recommended not to be included in the scale even if it is statistically significant (27). In addition, the item-total correlations on the scale are expected to be not negative and even greater than 0.25, and items that do not comply with this rule are recommended to be excluded from the scale,

but this is not a hard and fast rule (27). The item analysis was conducted to assess the contribution of the scale items to the total score of the scale and to determine to what extent they are related to the overall scale.

In the present study, the Cronbach's Alpha coefficient and Spearman-Brown and Guttman Split-Half reliability coefficient was found to be >0.70 for both sections and the subscales. According to the results of the present study, the Cronbach's alpha values indicated that the scale's reliability was high. These results were consistent with those of the original scale (14), showed that the measured items were relevant to the topic and that the scale was extremely reliable for use in Turkey.

In the reliability analysis of the scale and its sub-dimensions, the floor and ceiling effects should be $<15.0\%$ (18, 21). In the present study, the floor and ceiling effects were greater than 15.0% , which indicated that the scale and its sub-dimensions were quite reliable.

The response bias of the DRSES was determined using the Hotelling T^2 analysis method. This analysis method measures the perceived responses not the expected responses. The mean scores are equal to each other which indicate that the questions are perceived by the participants similarly, and that the difficulty levels of the questions are equal to each other. It is also aimed at evaluating whether the items' measurement abilities are close to each other and whether they have a normal distribution (28). In the response bias of the DRSES, it was evaluated that the responses given to each item were homogeneous. The results of this test revealed that the respondents replied to the items of the DRSES according to their opinions and that there was no response bias on the scales (Hotelling $T^2=355.106$, $p=0.000$).

In the interpretation of the item-total correlation, items with a value of 0.20 or higher are considered to have sufficient power to represent the scale, and items can be said

to discriminate between individuals well (22, 29). In the present study, the item-total score correlation coefficient and item-subscale total score correlation coefficient were found to be positive and greater than 0.20 . The positive high item-total correlation indicated that the items exemplified similar behaviors and that the internal consistency of the test was high.

Limitation of the study

Although the study was strong, it had some limitations. The first limitation was that it included only students who volunteered to participate in the study, which indicates that the sample did not represent all the students.

Conclusion

The results of the present study revealed that the DRSES was quite a valid and reliable tool for use in Turkey. Undergraduate nursing students' disaster response skills should be assessed using the DRSES, and studies with an experimental design including a control group should be planned. In order for the scope of these studies to affect nurses' disaster response skills at the desired level, they should be planned to obtain results that will make it possible to assess nurses' knowledge, skill and practice levels.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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References

1. International Federation of Red Cross and Red Crescent [IFRC]. World Disasters Report – Resilience: Saving Lives Today, Investing for Tomorrow. International Federation of Red Cross and Red Crescent Societies. Geneva, 2016. <https://www.ifrc.org/en/news-and-media/press-releases/general/world-disasters-report-2016---resilience-saving-lives-today-investing-for-tomorrow/>
2. Guha-Sapir D, Hoyois Ph, Wallemacq P, Below R. Annual Disaster Statistical Review 2016: The Numbers and Trends. Brussels: CRED; 2016. http://emdat.be/sites/default/files/adsr_2016.pdf
3. Kalanlar B. Teaching disaster nursing and management to nursing students: use of Jennings Disaster Management Model in nursing. [PhD thesis]. Hacettepe University Institute of Health Sciences, Public Health Nursing Program, Turkey; 2013.
4. Veenema TG. Expanding education opportunities in disaster response and emergency preparedness for nurses. *Nurs Educ Perspect* 2006;27:93–8.
5. Zarea K, Beiranvand S, Sheini-Jaberi P, Nikbakht-Nasrabadi A. Disaster nursing in Iran: Challenges and opportunities. *Australas Emerg Nurs J* 2014;17:190–6. [CrossRef]

6. Olchin L, Krutz A. Nurses as first responders in a mass casualty. *J Trauma Nurs* 2012;19:122–9. [CrossRef]
7. Yin H, He H, Arbon P, Zhu J. A survey of the practice of nurses' skills in Wenchuan earthquake disaster sites: Implications for disaster training. *J Adv Nurs* 2011;67:2231–8. [CrossRef]
8. Disaster Nursing Society. Disaster nursing. <http://www.jsdn.gr.jp/eng/diaster/nhtml>
9. Yan YE, Turale S, Stone T, Petrini M. Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education. *Int Nurs Rev* 2015;62:351–9. [CrossRef]
10. International Council of Nurses [ICN]. Position statement: Nurses and disaster preparedness; 2006. http://www.icn.ch/PS_A11_NursesDisaster-Prep.pdf
11. World Health Organization and International Council of Nurses. ICN Framework of Disaster Nursing Competencies. International Council of Nurses, Geneva, Switzerland, 2009.
12. International Nursing Coalition for Mass Casualty Education [INCMCE]. Educational Competencies for Registered Nurses Responding to Mass Casualty Incidents; 2003. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.396.8909&rep=rep1&type=pdf>
13. Al Thobaity A, Williams B, Plummer V. A new scale for disaster nursing core competencies: development and psychometric testing. *Australas Emerg Nurs J* 2016;19:11–9. [CrossRef]
14. Li HY, Bi RX, Zhong QL. The development and psychometric testing of a Disaster Response Self- Efficacy Scale among undergraduate nursing students. *Nurse Educ Today* 2017;59:16–20. [CrossRef]
15. O'Rourke N, Hatcher L. A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling, 2nd ed. SAS Institute, Inc., Cary, NC 1994. <https://support.sas.com/publishing/pubcat/chaps/61314.pdf>
16. Davis LL. Instrument review: Getting the most from a panel of experts. *Applied Nursing Research* 1992;5:194–7. [CrossRef]
17. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res Nurs Health* 2007;30:459–67. [CrossRef]
18. Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *J Clin Epidemiol* 2007;60:34–42. [CrossRef]
19. Büyüköztürk S. Factor Analysis: Basic concepts and its use in scale development. *Educ Manage Theory Pract* 2002;32:470–83. <http://static.dergipark.org.tr/article-download/imported/5000050785/5000048032.pdf?>
20. Polit DF. *Statistics and Data Analysis for Nursing Research* 2nd ed. USA New York: Appleton and Lange; 1996.
21. Şencan H. Reliability and validity in social and behavioral measurement, 1st ed. Ankara: Seçkin Publisher; 2005.
22. De Vellis RF. *Scale development, theory and Applications*, 3rd ed. India: SAGE Publication; 2012. pp.31–59.
23. Watson R, Thompson DR. Use of factor analysis in *Journal of Advanced Nursing: literature review*. *J Adv Nurs* 2006;55:330–41. [CrossRef]
24. Şimsek ÖF. *Introduction to structural equation modeling: LISREL fundamental principles and practices*. Istanbul: Ecinocs publications; 2010.
25. Hooper D, Coughlan J, Mullen MR. Structural equation modelling: guidelines for determining model fit. *Electronic Journal of Business Research Methods - EJB RM* 2008;6:53–60. https://issuu.com/academic-conferences.org/docs/ejbrm-volume6-issue1-article183?mode=a_p
26. Gözüm S, Aksayan S. A guide for transcultural adaptation of the scale II: psychometric characteristics and cross-cultural comparison. *J Res Dev Nurs* 2003;5:3–14.
27. Erkuş A. *Articles on psychometry*. Turkish Psychological Association Publications, 1st ed. Ankara: 2003. pp.36–42.
28. Özdamar K. *Statistical data analysis using package programs 2: Multivariate analysis*, 5th ed. Turkey: Kaan Printworks; 2004.
29. Jonhson RB, Christensen L. *Educational research: quantitative, qualitative, and mixed approaches*. California: SAGE Publication; 2014. pp.190–222. https://ismailsunny.files.wordpress.com/2017/07/educational-research_-quantitat-r-robert-burke-johnson.pdf