Psychometric Testing of the Chinese Version of Second Victim Experience and Support Tool

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Objectives: The Second Victim Experience and Support Tool (SVEST) is a 29-item, nine-subscale questionnaire, which measures the second-victim experience and quality of support resources after the health professionals involved with medical errors. Second victim is common among the registered nurses (RNs) in China; however, no Chinese version of the SVEST is available. This study aimed to evaluate the psychometric properties of the Chinese version of the SVEST (C-SVEST) among RNs.

Methods: The SVEST was forward and backward translated. The reliability and validity of the final C-SVEST were tested by using 625 RNs in Beijing, China. Internal consistency and split-half analysis were used to examine reliability, content validity was evaluated by expert committee, and validity was assessed via exploratory factory analysis and confirmatory factor analysis.

Results: The Cronbach α coefficient (0.59–0.92) and split-half analysis (Spearman-Brown coefficient = 0.88) were acceptable. The item-level content validity index (I-CVI) ranged from 0.85 to 0.97. The average of scale-level content validity index was 0.91. Eight factors were extracted by exploratory factory analysis, which explained 70.8% of the total variance of second-victim experience and support in the C-SVEST. The confirmatory factor analysis showed a good fit for a nine-factor structure and the values were acceptable: root mean square error approximation = 0.07; comparative fit index = 0.90; goodness-of-fit index = 0.84; and χ^2/df = 2.19.

Conclusions: The C-SVEST is a valid and reliable tool to assess the extent of second-victim distress and support resources in Chinese health care workers. In Asian culture, nurses are hesitant to express emotional distress and instead they express physical discomfort and turnover intentions.

Key Words: second victim, adverse events, China, reliability, validity

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D espite initiatives continuously intend to reduce health care errors; however, the complexities of health care and significant limitations imposed by human fallibility still could not prevent all potential patient safety issues.[1] When an adverse event (AE) occurred, the health care provider who involved in the event can be referred to as second victims.[2] The term "second victim" refers to "a health care provider involved in an unanticipated adverse patient event, medical error, and/or patient-related injury who becomes victimized in the sense that the provider is traumatized by the event."[3] Survey data indicate that 10.4% to 46.8% of health care providers were involved in patient's safety event,[4,5] and almost all of them experienced personal, emotional, and professional problems resulted from the event[6]; however, they are overlooked and left to handle the emotional repercussions by

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themselves.[7] For the health care providers who are involved in a serious of near-miss safety events, they may also reduce job confidence and satisfaction, which in turn increase anxiety, job-related stress, and sleep disorders.[8,9]

The second victims generally experience long-term effects, ranging from months to years, and some individuals admit to using drugs or alcohol or considering changing careers.[5] This means a lack of healthy coping strategy; the second-victim experience can harm both physical and emotional well-being and subsequently could compromise the safety for patients.[10] Effectively measuring outcomes related to second-victim–related distress and the quality of organizational support may prevent turnover intention and absenteeism.

The Second Victim Experience and Support Tool (SVEST) was originally developed by Burlison et al[11] and validated by testing content validity, construct validity, and internal consistency. The instrument was used to measure the second-victim experience and quality of organizational support resources, which could assist in promoting the implementation of programs and tracking the performance of support resources for second victims. Second victim is an existing phenomenon among Asian nurses[9,12]; however, no studies have been conducted to validate the psychometric properties of the SVEST in the Chinese population. The aim of the study was to evaluate the psychometric properties of the Chinese version of the SVEST (C-SVEST) among registered nurses (RNs). The findings of this study should provide health care organizations in China a better understanding of second victim in nurses.

METHODS

Study Design and Participants

This two-phase study was conducted during developing and evaluating the C-SVEST. In phase 1, the SVEST was translated into Mandarin Chinese to assess content validity, and in phase II, reliability and validity of the C-SVEST were tested. All RNs who provided direct patient care and involved in the adverse/near-misses event during the past year were eligible to take part in this study. Recruitment e-mails were sent through the WeChat (a social media in China) that previously compiled through the hospital's nursing quality control center; purpose of the study, inclusion criteria, and the confidential protection were explained. The eligible respondents were given questionnaire package in a sealed envelope by the first author (X.Z.) in their hospital's nursing quality control center, and they were asked to put the completed questionnaire in a locked box in the quality control center for the researchers to pick up.

A convenience sample of 689 full-time RNs from five teaching hospitals in Beijing took part in the study, that provided incomplete answer or answered all items with the same answer, were excluded from the final analysis, and 625 nurses completed the survey (90.71% response rate). Data for exploratory factor analysis (EFA) came from 358 RNs in three hospitals; other data from 267 RNs in two other hospitals were used for confirmatory factor analysis (CFA).

Instruments

The instruments used in this study included demographic form, AE scale,[13] and SVEST.[14] The SVEST includes 29 items (representing seven dimensions and two outcome variables) to measure the second-victim experiences after AE involvement and professional consequences for second victims. Burlison et al[14] developed SVEST based on existing literature and adopted Hinkin's recommendation,[11] and further validate it by using content and construct validity. The seven dimensions include psychological stress, physical stress, colleague support, supervisor support, institutional support, nonwork-related support, and professional self-efficacy; the two outcome variables are turnover intentions and absenteeism. All items use a 5-point Likert scale, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree), and the high scores for each dimension reflect more distressed feeling in response to patient safety events and high organizational support. Cronbach α reliability scores for the survey dimensions ranged from 0.61 (colleague support) to 0.88 (absenteeism).

The grade of AEs refers to the severity of the events that classified as grades 1 (the most severe AE) through 4 (near miss), according to the Chinese Hospital Association[13]: (*a*) grade 1 – severe AE: unexpected death or permanent loss of physical function but not resulted from the natural disease process; (*b*) grade 2 – moderate AE: the patient's dysfunction due to medical treatments rather than disease itself; (*c*) grade 3 – mild AE: the error occurred does not cause any harm to the patient, or the patient can be fully recovered without any treatment; and (*d*) grade 4 – near miss: the error have not been formed due to timely detection. The respondents were asked to fill out the most severe adverse/near-misses event that they had involved in the past year.

Procedures and Data Collection

The phase 1 study started with a team that translates the SVEST into Chinese by using forward- and backward-translation methods.[15] Permission to use and translate the scale was obtained from the original developers (personal communication, January 18, 2017). Forward translation from English to Chinese was performed independently by two bilingual researchers in the field of nursing and patient safety. The consistency between the original and the translated version was assessed by a bilingual nursing professor and determined to be relevant to Chinese culture. The back translation was performed by two independent bilingual translators who majored in nursing and medical English. The translated version was reviewed by one of the original developers (Dr. Hoffman). The translated C-SVEST was reviewed by a task force group that included six professional experts from the fields of medical, nursing, and patient safety. The content validity index (CVI) for all 29 items and subscale was evaluated using a 4-point Likert-type relevant scale (1 = not relevant to 4 = highly relevant) and discussed for any item with a value less than 3.[16] To ensure equivalence, clarity, and readability, the panel used the 4-point Likert scale (1 = not clear to 4 = very clear) to determine whether the expressions of the items could be clearly understood and suspect cross-cultural translation problem. In phase 2, the final C-SVEST was administered in five hospitals for psychometric tests.

Data Analysis

Validity and reliability were tested using the IBM SPSS24.0. To evaluate the content validity (I-CVI) and subscale CVI (S-CVI) were assessed based on the Polit and Beck guidelines, which indicate that the criteria for excellent I-CVI and S-CVI should have standards greater than 0.78 and 0.90, respectively.[16]

Construct validity was assessed via CFA that has been considered a superior approach to EFA in verifying construct validity.[17] Exploratory factor analysis was conducted to explore the underlying factor structure by deciding which factors to retain, what those factors represent, and which items load out those factors. Confirmatory factor analysis was conducted using AMOS for maximum likelihood estimation to evaluate construct validity.[18] Two models were tested: model 1 assessed nine latent variables based on the original SVEST structure (seven dimensions and two outcome variables) and model 2 assessed eight factors for from the EFA results in the Chinese population. The model fits were evaluated by the following goodness-of-fit indices[19]: (*a*) χ^2 ($P > 0.05$) or $\chi^2/df < 3$,[20] (*b*) root mean square means (<0.05), (*c*) root mean square error of approximation (<0.06–0.08), (*d*) goodness fit index (>0.90), (*e*) normed fit index (>0.90), (*f*) Tucker-Lewis index (>0.90), (*g*) comparative fit index (>0.90), and (*h*) Parsimony goodness fit index (>0.50). Internal consistency was measured to determine the weighted reliability of the nine subscales in the 29-item SVEST using Cronbach α coefficient, and α coefficient more than 0.70 indicated acceptable internal consistency.[21]

Ethical Considerations

The researchers obtained permission from the original SVEST authors before starting the cross-cultural adaptation procedure. This study was approved by the college's institutional review board (No. 201612028). Each participant signed the informed consent and completed the questionnaires anonymously.

RESULTS

Demographic Characteristics

The participants ranged age from 21 to 53 with a mean (SD) age of 31.65 (6.24) years, and they worked in hospital from 0.5 to 33 years. Most study participants were females (95.0%), with a bachelor's degree and above educational level in nursing (65.3%), married (69.1%), worked in the internal medicine units (48.5%), and also served a role as the preceptor for nursing students (64%). Of the reported AEs, 58.7% were grade 4 near misses, and only 1.5% were grade 1 severe events. The characteristics of the entire study participants as well as those in the EFA and CFA phase were detailed in Table 1; there was no statistically significant difference between the participants in EFA phase and CFA phase except for the AE grades. The prevalence for AEs in both phases were all leading by grade 4; however, compared with the EFA phase (51.7%), the RNs in CFA phase reported more near miss (64%).

Content Validity

The results of the expert panel reviews were used to evaluate the content validity. The equivalence, clarity, and readability of the C-SVEST were 90.6%, 91.5%, and 91.8%, respectively. The I-CVI ranged from 0.85 to 0.97, whereas the S-CVI was 0.91, which all are acceptable.[22] The two terms "supervisor" and "institution" were ambiguous in the translation process, and the two terms were additionally described to ensure the content validity. The "supervisor" was defined as a manager in a unit and/or hospital, and "institution" was defined as a unit and/or hospital.

Assessment of Factor Structure

A total of 358 RNs was included to assess the factor loading in the C-SVEST by using EFA. Principal component analysis was used as the extraction method, and factors with eigenvalues of 1 or greater were retained for oblimin rotation. The Kaiser-Meyer-

TABLE 1. Nurses Demographic Characteristics (N = 625)

Variable	Mean (SD)/n (%)	EFA (n = 358) Mean (SD)/n (%)	CFA (n = 267) Mean (SD)/n (%)	Comparison $\chi^2/t/Z$	P
Age, y	32.03 (5.96)	31.33 (5.88)	32.45 (6.04)	−1.495	0.135
Years worked in the hospital *	10.00	9.00	10.00	−1.676	0.091
Sex				0.008	0.928
Female	594 (95.0)	340 (95.0)	254 (95.1)		
Male	31 (5.0)	18 (5.0)	13 (4.9)		
Education level†				0.134	0.935
Secondary vocational	18 (2.9)	10 (2.8)	8 (3.0)		
Associate's	199 (31.8)	116 (32.4)	83 (31.1)		
Bachelor's and above	408 (65.3)	232 (64.8)	176 (65.9)		
Marital status				2.735	0.098
Married	432 (69.1)	238 (66.5)	194 (72.7)		
Single	193 (30.9)	120 (33.5)	73 (27.3)		
Work unit				0.905	0.924
Internal medicine	303 (48.5)	168 (46.9)	135 (50.6)		
Surgery	74 (11.8)	43 (12.0)	31 (11.6)		
Emergency	84 (13.4)	49 (13.7)	35 (13.1)		
Intensive	93 (14.9)	56 (15.7)	37 (13.9)		
Others	71 (11.4)	42 (11.7)	29 (10.9)		
Preceptor				3.112	0.062
Yes	400 (64.0)	227 (63.4)	183 (68.5)		
No	225 (36.0)	131 (36.6)	84 (31.5)		
Grades of AE‡				9.516	0.023
1	9 (1.5)	5 (1.4)	4 (1.5)		
2	35 (5.6)	10 (2.8)	18 (6.7)		
3	214 (34.2)	114 (31.8)	107 (40.1)		
4	367 (58.7)	229 (64.0)	138 (51.7)		

*All are the median.

†Secondary vocational degree: a 4-year senior high school for professional training; associate's degree: a 3-year college for professional training; bachelor's degree: a 4- or 5-year undergraduate course of training.

‡Grade 1: death related to AE, or severe AE; Grade 2: moderate AE; Grade 3: mild AE; Grade 4: near miss.

Olkin measure of sampling adequacy was 0.82. The Bartlett test of sphericity was significant (χ^2 = 5869.99, df = 406, $P < 0.001$), which indicated correlation between the items and the correlation matrix suitable for factor analysis. The pattern matrix of factor loadings indicated an eight-factor solution, rather than the nine-factor as the original tool, which accounted for 70.8% of variances of the C-SVEST. The dimensions were the same as the original tool, but physical distress and turnover intentions were combined as one factor (Table 2).

Construct Validity: CFA

A total of 267 RNs were used to evaluate the construct validity by using CFA. Model 1 tested the 29-item, nine-factor as suggested by the original study.[14] Model 2 tested was the 29-item, eight-factor as suggested by EFA in the current study. Both models showed similar goodness of fit; however, model 1 (χ^2/df = 2.19) showed a slightly better fit than model 2 (χ^2/df = 2.96). Model 1 results indicate acceptable model fitness between the hypothetical model of SVEST and the Chinese data in this study (Table 3).

Internal Consistency Reliability

The Cronbach α of the nine dimensions was 0.80 or greater, with the exception of colleague support (0.59), institutional support (0.60), and professional self-efficacy (0.61). Similar Cronbach αs were also shown in the original study done by Burlison et al (Table 4).[14] Split-half analysis for the scale showed acceptable stability (Spearman-Brown coefficient = 0.88).

Organizational Supports and Second-Victim–Related Distress

For the second-victim distress, the highest agreement was "psychological distress" (44.5%), followed by physical distress (26.6%) and professional self-efficacy (5.3%). For the organizational support, the percentage of agreement ranged from 1.1% for "colleague support" to 4.5% for "nonwork-related support." Among these RNs who experienced AEs, 30.2% reported turnover intentions and 7.4% had absenteeism. A comparison between our data and other research data are also given (Table 4).[12,14,23] The RNs, in the current study, reported higher second-victim distress and turnover intentions than those in the study by Burlison et al[14] but similar to those in the study by Kim et al.[12]

DISCUSSION

This study first translated the SVEST into C-SVEST and then further examined the psychometric properties of the C-SVEST. We have demonstrated that the C-SVEST is a valid and reliable tool for assessing the second-victim experience and support in

TABLE 2. Factor Loadings of the C-SVEST by Using EFA (n = 358)

Items	Physical Distress/ Turnover Intentions	Supervisor support	Professional Self-efficacy	Institutional Support	Absenteeism	Nonwork-Related Support	Colleague Support	Psychological Distress
A5	0.814							
A6	0.841							
A7	0.874							
A8	0.882							
A26	0.684							
A27	0.685							
A13		0.891						
A14		0.903						
A15		0.580						
A16		0.777						
A22			0.754					
A23			0.846					
A24			0.777					
A25			0.868					
A17				−0.864				
A18				−0.646				
A19				−0.862				
A28					−0.933			
A29					−0.923			
A20						0.922		
A21						0.936		
A9							0.657	
A10							0.438	
A11							0.683	
A12							0.674	
A1								0.808
A2								0.785
A3								0.832
A4								0.758
Eigenvalue	7.20	3.96	2.17	1.66	1.60	1.50	1.35	1.11
Total percentage of variance	24.82%	13.64%	7.48%	5.73%	5.51%	5.16%	4.64%	3.82%

Chinese RNs. The C-SVEST had acceptable internal consistency reliability and stability; however, the dimensions of colleague support, institutional support, and professional self-efficacy are remaining with low Cronbach αs as the original results[14] and the Korean[12] and Argentina versions.[23] Therefore, caution is needed when the three dimensions are used independently, or further study should consider either delete items or add more items to increase the internal consistency reliability.[21]

TABLE 3. Model Fit Index of the C-SVEST From CFA (n = 267)

	χ^2/df	RMR	RMSEA	GFI	TLI	CFI	NFI	PGFI
Model 1	2.19	0.07	0.07	0.84	0.94	0.90	0.83	0.66
Model 2	2.96	0.08	0.09	0.80	0.80	0.83	0.77	0.64

Abbreviations: CFI, comparative fit index; NFI, normed fit index; PGFI, Parsimony goodness fit index; RMR, root mean square means; RMSEA, root mean square error of approximation; TLI, Tucker-Lewis index.

In this study, multiple methods were used to evaluate the validity of the C-SVEST. Principal component analysis revealed a slightly different factor loading structure from the original version; however, the eight-factor explained 70.8% of the variance in C-SVEST, and factor components were higher than that of Korean (63%) and Argentina version (64.2%).[12,23] A qualitative meta-synthesis revealed that second victim's intense emotional distress had the greatest impact on their traumatized experiences,[1] but in the current study, the dimensions of physical distress and turnover intentions were loaded as one factor and contributed most of the variances (24.82%) (Table 2) in second-victim experiences. The findings may be due to cultural differences that Chinese nurses tended to use physical discomfort and turnover intentions to express their emotional feelings. Psychosomatic disorder is a condition in which psychological stresses adversely affect physiological (somatic) function[24]; therefore, when assessing the second-victim distress in Chinese RNs, more attention should be paid in physical symptoms. Further study is also needed to distinguish between the physical distress and turnover intentions in the C-SVEST.

The CFA confirmed that the loading factors in the C-SVEST consisted of the original nine components model, which is a better

TABLE 4. Mean, Standard Deviation, and Cronbach α Coefficients for SVEST (n = 625)

Items	Agreement, n (%)	Mean (SD)				Cronbach α			
		This Study	Original[14]	Korean[12]	Argentina[23]	This Study	Original	Korean	Argentina
Second-victim distress									
1. Psychological distress	278 (44.5)	3.67 (0.77)	2.62 (1.06)	3.46 (0.75)	4.0 (1.0)	0.83	0.83	0.82	0.74
2. Physical distress	166 (26.6)	3.17 (0.95)	2.32 (1.03)	3.03 (0.89)	2.2 (1.1)	0.92	0.87	0.87	0.70
3. Professional self-efficacy	33 (5.3)	2.91 (0.64)	2.50 (0.88)	3.22 (0.58)	2.2 (1.3)	0.61	0.64	0.63	0.85
Positive organizational support									
1. Colleague support	7 (1.1)	2.52 (0.54)	2.23 (0.63)	2.57 (0.57)	3.1 (1.1)	0.59	0.61	0.63	0.56
2. Supervisor support	9 (1.4)	2.35 (0.67)	1.89 (0.88)	2.56 (0.85)	3.3 (1.2)	0.80	0.87	0.76	0.44
3. Institutional support	11 (1.8)	2.79 (0.61)	2.34 (0.80)	2.67 (0.61)	2.3 (1.4)	0.60	0.64	0.59	0.79
4. Nonwork-related support	28 (4.5)	2.23 (0.80)	2.41 (1.02)	2.48 (0.75)	3.0 (1.4)	0.89	0.87	0.75	0.84
Outcome									
8. Turnover intentions	189 (30.2)	3.13 (0.99)	2.08 (1.17)	3.12 (0.92)	1.5 (0.9)	0.92	0.81	0.86	0.71
9. Absenteeism	46 (7.4)	2.27 (0.91)	1.81 (1.08)		1.2 (0.6)	0.88	0.88		0.73

fit than the eight-factor model that derived from the EFA (Table 3). Nonetheless, not all of the CFA statistics meet their respective goodness-of-fit criteria in this study, but this is not unexpected, as questionnaires developed in a hospital cultural environment are often not directly translated and used in another hospital cultural environment.[25] The discrepancies may be partly explained by organizational cultures, and behaviors have different meanings in China and the United States. Further research should consider the characteristics of health care institutions, such as patient safety culture and organizational learning behaviors, which may be related to second-victim phenomenon.

Among the respondents surveyed in this study, the scores in psychological distress, physical distress, and turnover intention were all significantly higher than the original SVEST study[14]; however, it is similar to the findings from the Korean study.[12] Culture plays an important role in emotional expression, most of Asian are ashamed to express their feeling and always choose to blame themselves when errors occur. In general, when the nurses have experienced AEs, they actively report and are keen to share learning from mistakes, but at the same time, they are also worried that AEs will have adverse consequences for themselves. Therefore, they might leave their jobs because of emotional effects of AEs or burnout. Studies have shown that females could be more vulnerable to the second-victim phenomenon than men,[26] and effective support interventions are generally came from managers and peers, especially in supports of affection and information.[27] However, in the support options, nonwork-related support (agreement = 4.5%) (Table 4) is the highest in current study, indicating that familial support is the focus of Chinese culture.

The validity and reliability of the C-SVEST were acceptable, which can be a useful tool for assessing the second-victim–related distress, intentions to turnover and absenteeism, and organizational support resources in China. However, this study has some limitations. The validity and reliability of C-SVEST were satisfactory, but the findings were only from RNs; therefore, further research is required to examine the use of C-SVEST with other health care providers. Confirmatory factor analysis was used to validate the original model, but it did not get the optimal goodness of fit. Future studies with an aim to test the hypothesized factorial model with CFA and modify the C-SVEST were needed. Recently, medical and patient advocators suggest use the term "second victim" with caution, because it could be a threat to enacting the needed cultural changes to achieve a patient-centered environment focused on patient safety.[28]

CONCLUSIONS

In Asian culture, most Asian nurses are hesitant to express emotional distress and usually blame themselves as opposed to a system failure. Thus, nurses might tend to express physical discomfort and turnover intentions instead of emotional distress; therefore, findings from this study may in variance to those found in other cultures. The evidences of validity and reliability of the C-SVEST are provided as effective for assessing the extent of second-victim distress and support resources in Chinese RNs. However, cautions are needed when using the C-SVEST, particularly if the subscales are used separately. Moreover, the SVEST measurements should consider the interaction between organizational and individual factors, which might provide a better understanding of the second-victim phenomenon.

REFERENCES
1. Schiess C, Schwappach D, Schwendimann R, et al. A transactional "second-victim" model-experiences of affected healthcare professionals in acute-somatic inpatient settings: a qualitative metasynthesis. *J Patient Saf*. 2018;1. doi: 10.1097/PTS.0000000000000461.

2. Conway J, Federico F, Stewart K, et al. *Respectful Management of Serious Clinical Adverse Events. IHI Innovation Series White Paper*. Cambridge, MA: Institute for Healthcare Improvement; 2010.

3. Scott SD, Hirschinger LE, Cox KR, et al. Caring for our own: deploying a system wide second victim rapid response team. *Jt Comm J Qual Patient Saf*. 2010;36:233–240.

4. Scott SD, Hirschinger LE, Cox KR, et al. The natural history of recovery for the healthcare provider "second victim" after adverse patient events. *Qual Saf Health Care*. 2009;18:325–330.

5. Pratt SD, Jachna BR. Care of the clinician after an adverse event. *Int J Obstet Anesth*. 2015;24:54–63.

6. Ullstrom S, Andreen Sachs M, Hansson J, et al. Suffering in silence: a qualitative study of second victims of adverse events. *BMJ Qual Saf*. 2014; 23:325–331.

7. Harrison R, Lawton R, Perlo J, et al. Emotion and coping in the aftermath of medical error: a cross-country exploration. *J Patient Saf*. 2015;11:28–35.

8. Mira JJ, Carrillo I, Lorenzo S, et al. The aftermath of adverse events in Spanish primary care and hospital health professionals. *BMC Health Serv Res*. 2015;15:151.

9. Chan ST, Khong BPC, Pei Lin Tan L, et al. Experiences of Singapore nurses as second victims: a qualitative study. *Nurs Health Sci*. 2018;20: 165–172.

10. Quillivan RR, Burlison JD, Browne EK, et al. Patient safety culture and the second victim phenomenon: connecting culture to staff distress in nurses. *Jt Comm J Qual Patient Saf*. 2016;42:377–386.

11. Hinkin TR. A brief tutorial on the development of measures for use in survey questionnaires. *Organ Res Methods*. 1998;1:104–121.

12. Kim EM, Kim SA, Lee JR, et al. Psychometric properties of Korean version of the second victim experience and support tool (K-SVEST). *J Patient Saf*. 2018. doi: 10.1097/PTS.0000000000000466.

13. Zhu XP, Tian MM, Shi Y. Status of research on classification system of medical adverse events at home and in abroad. *Chin Nurs Res*. 2013;27: 1281–1284.

14. Burlison JD, Scott SD, Browne EK, et al. The second victim experience and support tool: validation of an organizational resource for assessing second victim effects and the quality of support resources. *J Patient Saf*. 2017;13: 93–102.

15. Brislin RW. Back-translation for cross-cultural research. *J Cross Cult Psychol*. 1970;1:185–216.

16. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendation. *Res Nurs Health*. 2006;29:489–497.

17. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equation Model*. 1999;6:1–55.

18. Watson R, Thompson DR. Use of factor analysis in Journal of Advanced Nursing: literature review. *J Adv Nurs*. 2006;55:330–341.

19. Kline RB. *Principles and Practice of Structural Equation Modeling*. New York, NY: The Guilford Press; 2015.

20. Hair JF, Black WC, Babin BJ, et al. *Multivariate Data Analysis*. New Jersey : Pearson Education, Inc; 2006.

21. Gliem JA, Gliem RR. *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. In: Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*. Columbus, OH: Ohio State University; 2003.

22. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res Nurs Health*. 2007;30: 459–467.

23. Brunelli MV, Estrada S, Celano C. Cross-cultural adaptation and psychometric evaluation of a second victim experience and support tool (SVEST). *J Patient Saf*. 2018. doi: 10.1097/PTS.0000000000000497.

24. Satsangi AK, Brugnoli MP. Anxiety and psychosomatic symptoms in palliative care: from neuro-psychobiological response to stress, to symptoms' management with clinical hypnosis and meditative states. *Ann Palliat Med*. 2018;7:75–111.

25. Matsubara S, Hagihara A, Nobutomo K. Development of a patient safety climate scale in Japan. *Int J Qual Health Care*. 2008;20:211–220.

26. Seys D, Wu AW, Van Gerven E, et al. Health care professionals as second victims after adverse events: a systematic review. *Eval Health Prof*. 2013; 36:135–162.

27. Tamburri LM. Creating healthy work environments for second victims of adverse events. *AACN Adv Crit Care*. 2017;28:366–374.

28. Clarkson MD, Haskell H, Hemmelgarn C, et al. Abandon the term "second victim". *BMJ*. 2019;364:l1233.