

8-2019

Improving Internal Reliability of a Trauma-Informed Care Program Evaluation Instrument

Ashley A. Raposo-Hadley

University of Nebraska Medical Center, ashley.raposoahadley@gmail.com

Let us know how access to this document benefits you

<http://unmc.libwizard.com/DCFeedback>

Follow this and additional works at: https://digitalcommons.unmc.edu/coph_slce

 Part of the [Public Health Commons](#)

Recommended Citation

Raposo-Hadley, Ashley A., "Improving Internal Reliability of a Trauma-Informed Care Program Evaluation Instrument" (2019).
Capstone Experience. 89.

https://digitalcommons.unmc.edu/coph_slce/89

This Capstone Experience is brought to you for free and open access by the Master of Public Health at DigitalCommons@UNMC. It has been accepted for inclusion in Capstone Experience by an authorized administrator of DigitalCommons@UNMC. For more information, please contact digitalcommons@unmc.edu.

Improving Internal Reliability of a Trauma-Informed Care Program Evaluation Instrument

Ashley Raposo-Hadley
MPH, Epidemiology Concentration

Committee Chair: Tricia LeVan, Ph.D.
Committee Faculty: Jungyoon Kim, Ph.D.
Committee Preceptor: Charity Evans, M.D., M.H.C.M., F.A.C.S.
Committee Member: Ashley Farrans, MSN, MBA, RN

Abstract

The project has analyzed the recent changes to the trauma informed care (TIC) curriculum evaluation instrument by assessing the changes in Cronbach's Alpha scores and effect significance. Data was collected from pre-training and post-training surveys completed at time of delivery of the TIC curriculum training. Participants included hospital staff and medical or nursing students at Nebraska Medicine, University of Nebraska Medicine Center, and Health Creighton University Medical Center.

The three research questions are (1) Did the item edits change item subgroupings? (2) Did the item edits increase instrument reliability? (3) Did the item edits impact statistical significance?

3 subscales, *working with trauma*, *confidence*, and *knowledge*, were identified in a factor analysis. The Cronbach alpha scores were 0.783, 0.843, and 0.701, respectively. These scores indicate acceptable internal reliability among subscale items and are an improvement from the reliability estimates of the previous instrument.

A paired sample t-test was used to analyze significant differences between the pre and post surveys. Participants reported feeling more confident understanding, recognizing, and treating patients with trauma ($p < 0.001$). Participants also reported having a better understanding of trauma-informed care (TIC), the Adverse Childhood Experiences (ACEs) study, and the long-term neurobiological impact of trauma ($p < 0.001$).

Literature review

Trauma has traditionally been defined in a physical sense using biological criteria (i.e. trauma patient) within medical settings. This definition lacks inclusion of events or stress that can be emotionally and mentally traumatic. The Substance Abuse and Mental Health Services Administration (SAMHSA) offers a more comprehensive definition of trauma as “[...] event, series of events, or set of circumstances experienced by an individual and physical or emotionally harmful or life-threatening [...]”¹. However, even this definition does not include the short and long-term effects of *perceived* threat. Trauma Matters Omaha’s Trauma- Informed Care (TIC) educational program for medical professionals overcomes this disconnect by defining trauma as “witnessing or experiencing an event that poses a real or perceived threat. The event overwhelms one’s ability to cope and has lasting adverse effects on the individual’s functioning and well-being”². The TIC program was developed by the Trauma Matters Omaha in collaboration with Project Harmony to educate and train medical professionals on the life-long impacts of distressful childhood experiences and how to incorporate this knowledge into the care they deliver. By training medical professionals on the lasting impact of childhood trauma and its relationship to adult health, Nebraska Medicine hopes to advance the clinical care of individuals who have experienced trauma. An alarming number of individuals have experienced at least one adverse childhood experience making them more susceptible to the health outcomes the TIC program is working to combat³.

One of the largest studies of childhood trauma to date is the Adverse Childhood Experiences study (ACEs)⁴. The study developed an ACE score, which is a measure of exposure to several kinds of childhood abuse. The ACEs questionnaire consists of 10 questions across 3 levels of abuse (e.g. psychological, physical and sexual) and 4 levels of household dysfunction

(e.g. substance abuse, mental illness, mother treated violently, or household member imprisoned)⁵. The relationship between ACE score and poor health consequences in adulthood is strongly established⁴. For example, trauma experienced in childhood contributes to life-long chronic health issues and risk of engaging in risky behavior.

Risk of experiencing adverse health outcomes of affective, somatic, alcohol and illicit drug abuse, cognition and memory, risky sexual behavior, and aggressive behavior, increased significantly for every unit increase in ACEs score (p-value < 0.001)⁵. There is also a significant dose response between ACEs scores and risk of disease in adulthood. Ischemic heart disease, cancer of any type, chronic bronchitis or emphysema, history of hepatitis or jaundice, skeletal fractures, and poor self-rated health are significantly related to ACEs score (p-value < 0.05)⁴.

About 64% of the general adult American population reports an ACE score of at least one and about 12.5% report a score of at least four⁴. A hospital-based violence prevention program screened for ACEs scores in patients admitted for violent injury. 75% met diagnostic criteria for post trauma stress disorder, 56.3% reported an ACEs score of at least three, 34.5% reported a score of at least five, and 18.8% reported a score of at least seven³. Furthermore, ACEs scores are alarmingly high in juvenile justice populations. 50% of juvenile offenders report an ACEs score of at least four and are thirteen times less likely to report a score of zero compared to the original ACEs study sample. The same study found that ACEs scores were strongly related to odds of re-offence⁶. In summary, trauma impacts the probability of engaging in risky health behaviors, developing chronic conditions and cancer, and being admitted to the hospital under conditions of violence.

Other hospital-based TIC programs found that TIC training contributed to clinicians being more comfortable with discussing trauma with their patients as well as offering resources and that patients were generally comfortable receiving the screening (p-value < 0.01)⁷. A mixed methods TIC program evaluation found that after TIC education, emergency room nurses were more confident when discussing traumatic experiences with their patients and responding to disclosure of family violence (p=0.01)⁸.

The TIC curriculum works to educate medical professionals and is a one-hour educational training on the long-term impact of trauma on health outcomes, the mental and physical effects of ACEs, bias and assumption awareness, and the foundations of TIC. Trauma Matters Omaha developed the TIC program used at Nebraska Medicine and Health Creighton University Medical Center (CHI) to train medical providers and hospital staff to rethink how they define trauma, reflect on the role of trauma within the care they deliver and the conditions of their patients, and assess their own triggers and traumatic experiences. The TIC curriculum is founded in the six key principles of a trauma informed approach consistent with the Substance Abuse and Mental Health Services Administration's (SAMHSA) framework; safety, trustworthiness and transparency, peer support, collaboration and mutuality, empowerment, and cultural, historical, and gender issues⁹.

Significance

Presently, no validated tool regarding nationwide TIC program evaluation exists. Systematic review of TIC organizational interventions suggests the lack of consistency among assessment instruments as a major limitation of intervention evaluation methods¹⁰. As hospital-based TIC programs become more prevalent, it is paramount to develop a reliable and robust evaluation tool.

The *Trauma Informed Care Curriculum Pre-training and Post-training Survey* was developed by Trauma Matters Omaha to evaluate the efficacy and compatibility of the hospital-based TIC curriculum at Nebraska Medicine and CHI. The instrument consists of 17 items across 5 subscales; Confidence, Clinical Knowledge, Professional Knowledge, Self-Awareness, and Assumptions and Biases (Table 2). All items were answered using a five-point Likert scale ranging from strongly disagree to strongly agree.

Overall unacceptable reliability on four out of the five subscales (Cronbach's Alpha < 0.7)¹¹. The main limitation of the previous instrument was the small sample size and item recategorization based on face validity. It has been suggested that a sample size of at least 400 is necessary to calculate an accurate reliability coefficient¹². Furthermore, exploratory factor analysis has been suggested as the preferred method of factor extraction¹³.

Upon further data collection another reliability evaluation was completed. The addition of nearly 250 surveys did not improve Cronbach's Alpha scores. As a result, an exploratory factor analysis was performed, which led to changing the subcategorization of the survey items and reworking or removal of several confusing questions. Data has now been collected using the revised tool and another evaluation of its reliability is the topic of the present capstone.

The outcome of the present capstone will be a reliable instrument to evaluate hospital-based trauma informed care training programs. As the TIC program at Nebraska Medicine expands and continues to collect data within new medical systems, the instrument will be used to reliably make comparisons between samples and across time.

Methods

Specific Aims

The primary goal of the present capstone project was to assess the validity of the revised Trauma Informed Care (TIC) curriculum evaluation tool developed by the Trauma Matters Omaha coalition. The project evaluated the recent changes to the TIC curriculum evaluation instrument by assessing the changes in Cronbach's Alpha scores and a significance test. The three questions being answered are: (1) Did the item edits change item subgroupings? (2) Did the item edits increase instrument reliability? and (3) Can the effect of the program be measured using a reliable instrument?

Data collected and analyzed using the initial tool identified several limitations of the survey. Namely, there was a lack of internal reliability, items belonged to more than one underlying factor, and certain items were confusing for participants to understand. The instrument was edited to rectify these issues. Participants respond using a Likert scale measuring from 1 = "Strongly Disagree" to 5 = "Strongly Agree". Because several items were negatively worded, it was necessary to reverse code their responses to balance for scale direction.

The following items were formally reverse coded:

Individuals who are injured or sick as a result of high-risk behaviors are very likely to return with another injury/illness.

It is not my role to recognize a patient's previous trauma.

All patients can change their high-risk behavior if they only had the motivation.

I worry that I might upset others by discussing personal stressors.

“Trauma” refers to a serious or life-threatening physical injury that causes a patient to seek treatment.

There is no relationship between trauma experienced in childhood and mental and physical outcomes in adulthood.

I do not feel confident recognizing when someone is re-experiencing a traumatic event.

However, these items were yielding substantially lower reliability coefficients compared to the non-reverse coded items and belonged to more than one underlying factor. Items 3 and 15 were removed from the instrument and 4, 5, 12, 11, and 10 were edited to avoid reverse coding and better state their intended meaning.

Data has recently been collected using the new survey tool. A test for reliability will be used to determine if the changes made to the instrument improved internal reliability. Additionally, a paired sample t-test will be performed to assess any differences in effect as a result of the instrument changes.

Data from group 1 was collected under the previous survey tool (i.e. instrument 1) and data from group 2 was collected under the revised survey tool.

Instrument 1 Methods: Data using the first instrument was collected between October 2018 and February 2019. Participants attended the *Trauma Matters Omaha Trauma: Overview for Medical Professionals* training. All participants were employed or a student at Nebraska Medicine, University of Nebraska Medical Center (UNMC), or CHI. Training sessions typically took place during meeting times or education periods. The training is approximately one hour in duration and delivered by a Trauma Matters Omaha trained TIC lecturer in person.

The surveys were completed on paper immediately before and after the training delivery. The surveys were immediately collected after the training and data were entered in Microsoft Excel spreadsheet. Upon collection of 410 pre-training and post-training surveys using the first instrument Cronbach's Alpha scores were calculated. The 5 original subscales included *confidence, clinical knowledge, professional knowledge, self-awareness, and assumptions and biases*. The Cronbach's Alpha scores were .752, .440, .008, .465, .182, respectively (Table 2). The only subscale that meets the cutoff value of .7 for 'acceptable' is Confidence (.752)¹⁴

The exploratory factor analysis with rotation method Varimax with Kaiser Normalization and suppression coefficients set to 0.4. The varimax rotation method is standard in the literature and coefficient loadings above 0.5 are generally considered "strong"¹⁵. Three underlying factors were identified. New subcategories were created reflecting the results of the exploratory factor analysis. The new subcategories can be summarized as *Confidence, Working with Trauma, and Assumptions and biases*. Cronbach's Alpha scores were calculated for the new subcategories.

Instrument 2 Methods: 263 participants attended the TIC training and completed the pre and post-test using the second instrument between February 2019 and June 2019 (Appendix 2). A factor analysis with rotation method Varimax with Kaiser Normalization was performed. Coefficients below 0.4 were suppressed because coefficient loadings above 0.5 are generally considered "strong"¹⁵. This allows the factor analysis to identify the items that only "strongly" belong to any factor and remove items that are weakly cross loading between factors.

A paired t-test with alpha = 0.05 was performed to evaluate the statistical effect of the training using SPSS software. Mean subscale scores were computed by averaging the participants responses on individual subscale items. Mean subscale scores were compared on the

pre and post-test to measure statistically significant differences as a result of the TIC training. Cronbach's Alpha score was obtained for the subscales to evaluate the instrument reliability. Generally, Cronbach's Alpha scores above 0.7 are "acceptable"¹⁴.

Results

Participation in the TIC training was voluntary and thus the results are subject to a voluntary response bias. Participants may be more open to TIC and more accepting of adopting a new approach given their attendance at a voluntary training session.

Participants were predominantly female (58%), White (85%), and were generally either employed at Nebraska Medicine as a registered nurse (32.6%) or attended UNMC as a medical student (40.6%). Given that large proportion of students, the sample consequently consisted of young adults, mostly between the ages of 20 and 30 years old (76%) (Table 1).

Table 1. Demographic characteristics of study groups

Demographic Characteristics	Instrument 1 (N=410)	Instrument 2 (N=262)
Facility, % Nebraska Medicine	35.8	100
Gender, % female	71.4	58.0
Age group, %		
20-30	36.5	76.0
31-40	24.3	14.3
41-50	15.1	5.4
51-60	15.1	2.7
60+	7.5	1.6
Ethnicity, %		
African American	3.4	2.7
Caucasian	87.0	85.0
Hispanic	3.2	3.5

Other	6.4	8.8
Current Role, %		
Physician	0.5	2.3
Medical Student	21.3	40.6
Registered Nurse	34.5	32.6
Nurse Practitioner	0.7	0.4
Technician	3.4	16.9
Security	10.9	0.4
Other	28.3	6.8

Instrument 1 Results: The exploratory factor analysis with rotation method Varimax with Kaiser Normalization and suppression coefficients were set to 0.4. The varimax rotation method is standard in the literature and coefficient loadings above 0.5 are generally considered “strong”¹⁵. Three underlying factors were identified; *working with trauma*, *confidence*, and *Assumptions and Biases* (See Table 2 for coefficient loadings).

The Cronbach’s Alpha scores were 0.789, 0.670, and 0.614 for Confidence, Working with Trauma, and Assumptions and Biases, respectively (Table 3). All items in the original instrument were clinically meaningful. To preserve items that heavily cross loaded between factors or yielded low coefficient loadings, the TIC team reworked the items to more clearly state their intended meaning. Changes made to the instrument can be seen in Appendix 2.

Table 2. Rotated Component Matrix – Instrument 1

Survey Item	Confidence	Working with Trauma	Assumptions and Biases
1	.697		
7	.588		
8	.774		
9	.826		

14	.697		
6		.569	
13		.661	
16		.625	
17		.715	
5			.612
11		.424	.635
12			.587
15	.455		.554
2			
3	-.645		
4	-.612		
10	.530		

Note: Extraction Method: Principle Component Analyses. Rotation Method: Varimax with Kaiser Normalization. Coefficient loadings below 0.4 are suppressed.

The new subcategories and removal of questions with heavy between factor cross loadings resulted in approaching acceptable reliability coefficients. The items removed from the analysis include (2) “I have a good understanding of the meaning of “trauma-informed care” because it did not strongly belong to any factor, and (3) “Trauma refers to a serious or life-threatening physical injury that causes a patient to seek treatment”, (4) “Individuals who are injured or sick as a result of high-risk behaviors are very likely to return with another injury/illness”, and (10) “I do not feel confident recognizing when someone is re-experiencing a traumatic event” because of negative and confusing wording.

Table 3. Instrument 1 Reliability Results

Subscale	Survey Items	Cronbach's Alpha Score
Confidence	8, 9, 10, 14	.752
Clinical Knowledge	3, 11, 13, 17	.440
Professional Knowledge	1, 2, 7	.008
Self-Awareness	6, 16	.465
Assumptions and Biases	4, 5, 12, 15	.182

Table 4. Instrument 1 Factor Analysis and Reliability Results

Subscale	Survey Items	Cronbach's Alpha Score
Confidence	8, 9, 14, 1, 7	.803
Working with Trauma	13, 17, 16, 6	.670
Assumptions and Biases	11, 5, 12, 15	.614

Note: Items 2, 3, 4, and 10 were removed in this analysis.

Instrument 2 Results:

Did the item edits change item subgroupings?

The exploratory factor analysis with rotation method Varimax with Kaiser Normalization and suppression coefficients were set to 0.4. The varimax rotation method is standard in the literature and coefficient loadings above 0.5 are generally considered “strong”¹⁵. Three underlying factors were identified; *working with trauma*, *confidence*, and *knowledge* (See Appendix 3 for item groupings. See Table 5 for coefficient loadings). Item 9 did not strongly

belong with any subscale and thus was removed from further analysis. The items appear to intuitively group together.

Table 5. Rotated Component Matrix – Instrument 2

Survey Item	Working with Trauma	Confidence	Knowledge
13	.677		
14	.781		
15	.806		
11	.599		
2	.661		
3	.574		
4	.540		
6		.835	
7		.848	
8		.728	
12		.686	
9			
1		.476	.667
5			.797
10			.579

Note: Extraction Method: Principle Component Analyses. Rotation Method: Varimax with Kaiser Normalization. Coefficient loadings below 0.4 are suppressed.

Did the item edits increase instrument reliability?

Item 10, “all patients with high risk behavior lack motivation to change”, was reverse coded to match the unidimensionality of the scale. Item 10 was included in the Knowledge scale; however, the item yielded a substantially lower reliability coefficient and thus was removed from the analysis. Cronbach’s Alpha scores were calculated for the three subscales. Scores of .783,

.843, and .701 were obtained for Working with Trauma, Confidence, and Knowledge, respectively (Table 6). All scores meet the criteria for ‘acceptable’ and demonstrate reliability¹⁴.

Table 6. Instrument 2 Factor Analysis Reliability Results

Subscale	Survey Items	Cronbach’s Alpha Score
Working with Trauma	2, 3, 4, 11, 13, 14, 15	.783*
Confidence	6, 7, 8, 12	.843*
knowledge	1, 5	.701*

* Indicates an “acceptable” Cronbach’s Alpha Score

Did the item edits impact statistical significance?

A paired sample t-test was performed using the subscale mean pre- and post- survey responses to quantify the effect of the TIC program delivery. There was a statistically significant difference between responses on the pre- and post-test surveys on all subscales (Table 7).

Inconsistent with the findings of Hall et al., the present sample felt that recognizing trauma in their patients was part of their role and recognized that a clinical setting could contribute to trauma⁸. The mean response for item 3 (i.e. “It is my role to recognize a patient’s previous trauma”) was 4.12 and 4.56, where 1 = “Strongly Disagree” and 5 = “Strongly Agree”, pre and post-test respectively ($p < 0.001$). The mean response for item 11 (i.e. “The physical environment of the hospital can contribute to people feeling unsafe”) was 4.07 and 4.63 for the pre and post-test ($p < 0.001$).

There was a stronger response bias on the post-test than the pre-test. 6.9% of the sample responded in accordance with a ceiling effect on the post-test compared to 0.76% on the pre-test. When these cases were removed from the analysis, it did not impact the reliability or statistical significance of the subscales. The present analysis included these cases as they were not determined to be strongly influential on the results.

Table 7. Paired T-test Results

Survey Item	Mean Difference, (SD)	P-value
Working with Trauma	0.518 (.483)	<0.001
There is a strong link between childhood trauma and brain development.	0.452 (.681)	<0.001
It is my role to recognize a patient's previous trauma.	0.444 (.814)	<0.001
When working with trauma survivors (physical or emotional), certain triggers may invoke feelings in me not related to my work at hand.	0.694 (.960)	<0.001
The physical environment of the hospital can contribute to people feeling unsafe.	0.566 (.804)	<0.001
Discussing past traumatic experiences impacts the patient's experience in health care.	0.643 (.760)	<0.001
I recognize my past trauma experiences may impact the way I interact with others.	0.564 (.743)	<0.001
Certain environments can trigger a physiological and/or psychological response in a person related to their prior trauma.	0.335 (.803)	<0.001
Confidence	0.818 (.664)	<0.001
I am confident in my ability to interact sensitively with a patient who has a history of traumatic events (childhood sexual abuse, domestic violence, etc.).	0.516 (.865)	<0.001
I am confident knowing how to respond to my patient after recognizing a history of trauma	0.829 (.914)	<0.001

I do feel confident recognizing when someone is re-experiencing a traumatic event.	0.907 (.908)	<0.001
I can explain what trauma is, including its effects	1.078 (.85)	<0.001
Knowledge	2.167 (1.120)	<0.001
I have a good understanding about the meaning of “trauma-informed care”	2.099 (1.212)	<0.001
I understand the clinical and scientific findings of the Adverse Childhood Experiences (ACEs) study.	2.279 (1.357)	<0.001

Discussion

Medical personnel practicing within a TIC framework may reduce re-traumatization through improving the providers knowledge on the prevalence of trauma and the ways in which it impacts individual patients. A reliable evaluation of the instrument aids in measuring the difference in knowledge on the topic delivered through TIC training. As the TIC program continues to expand and train more medical professionals, more data should be collected to continue measuring the test-retest reliability.

The results of the current capstone identified that clinical staff, particularly registered nurses and medical students, felt more confident in their ability to recognize and respond to patient trauma after attending a TIC educational training program, better understood the long-term health and neurobiological effects of trauma, and recognized the role of their position and the hospital environment in the process of re-traumatization.

In contradiction to previous research, the present results indicated that the participants felt responsible for identifying trauma and recognized the contribution of a clinical environment in traumatization or re-traumatization. The present participants were younger than that studied by Hall et al.⁸. It is possible that the present participants are more open to TIC conceptually because

they are still in the process of developing themselves as medical professionals and don't hold the same preconceived notions or habits of their role that more experienced individuals may have. 58.4% of the present sample reported being in their current role for between 1-2 years. Data should be collected from participants with more experience in their current role to continue to assess the reliability of the instrument as well as evaluate the perception of TIC and its acceptance stratified by age and clinical role.

Limitations: A major limitation of the present capstone is the homogeneous sample. Participants were demographically limited to young and White. The present results do not generalize to older individuals or individuals who have considerable amount experience working within a clinical setting. Additionally, the present data was collected at a single medical center. The organizational culture at UNMC might be more open to the adoption of novel approaches to treatment than other medical settings.

The present capstone yields promising results in the form of an internally consistent and reliable instrument to evaluate the TIC program currently conducted at Nebraska Medicine. The results indicate that the program is efficacious in increasing the knowledge related to TIC and ACEs in participants. However, the results do not characterize the experience of practicing a TIC approach or measuring its impact on everyday circumstance.

Going forward, more data should be collected with more diverse samples to retest the reliability of the instrument. A qualitative component to the program evaluation should be explored to more comprehensively describe the experience of adopting a TIC approach. Key informant interviews or focus groups with participants could shed light on the struggles and assets of the TIC program adoption. A more complete understanding of the complexities of

operating within a TIC framework and the limitations of the current training should be used to develop a second phase to the current program.

References

1. SAMHSA. Trauma and violence. <https://www.samhsa.gov/trauma-violence>. Updated 2019.
2. Trauma Matters Omaha. Trauma: Overview for medical professionals. . 2018.
3. Theodore J. Corbin, Jonathan Purtle, Linda J. Rich, John A. Rich, Erica J. Adams, Garrett Yee, Sandra L. Bloom. The prevalence of trauma and childhood adversity in an urban, hospital-based violence intervention program. *Journal of Health Care for the Poor and Underserved*. 2013;24(3):1021-1030.
4. Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American journal of preventive medicine*. 1998;14(4):245-258.
5. R. F. Anda, V. J. Felitti, D. Bremner, et al. The enduring effects of abuse and related adverse experiences in childhood. *European archives of psychiatry and clinical neuroscience*. 2006;256(3):174-186.
6. Baglivio MT, Epps N, Swartz K, Huq MS, Sheer A, Hardt N. The prevalence of adverse childhood experiences (ACE) in the lives of juvenile offenders. *Journal of Juvenile Justice*. 2014;3(2).

7. Flanagan T, Alabaster A, McCaw B, Stoller N, Watson C, Young-Wolff KC. Feasibility and acceptability of screening for adverse childhood experiences in prenatal care. *Journal of Women's Health*. 2018;27(7):903-911.
8. Hall A, McKenna B, Dearie V, Maquire T, Charleston R, Furness T. Educating emergency department nurses about trauma informed care for people presenting with mental health crisis: A pilot study. *BMC Nursing*. 2016;15(21).
9. SAMHAS's Trauma and Justice Strategic Initiative. SAMHSA's concept of trauma and guidance for a trauma-informed approach. https://store.samhsa.gov/product/SMA14-4884?WT.mc_id=EB_20141008_SMA14-4884. Updated 2014/2019.
10. Purtle J. Systematic review of evaluations of trauma-informed organizational interventions that include staff trainings. *Trauma, Violence, and Abuse*. 2018.
11. Amanda Kiss. *An evaluation of implementing trauma-informed care training in healthcare settings*. [MPH]. Omaha, Nebraska: UNMC; 2018.
12. Richard A. Charter. Study samples are too small to produce sufficiently precise reliability coefficients. *The Journal of General Psychology*. 2003;130(2):117-129.
13. Alexandra Rouquette, Bruno Falissard. Sample size requirements for the internal validation of psychiatric scales. *International Journal of Methods in Psychiatric Research*, Wiley. 2011;20(4):235-249.
14. Santos J. Cronbach's alpha: A tool for assessing the reliability of scales. *The Journal of Extension*. 1999;37(2).

15. Yong AG, Pearce S. A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*. 2013;9(2):79-94.

Appendix 1. Instrument 1

Subscale	Items
Confidence	<p>(8) I am confident in my ability to interact sensitively with a patient who has a history of traumatic events (childhood sexual abuse, domestic violence, etc.).</p> <p>(9) I am confident knowing how to respond to my patient after recognizing a history of trauma.</p> <p>(10) - (R) I do not feel confident recognizing when someone is re-experiencing a traumatic event.</p> <p>(14) I can explain what trauma is, including its effects.</p>
Clinical Knowledge	<p>(1) There is a strong link between childhood trauma and brain development.</p> <p>(11) - (R) There is no relationship between trauma experienced in childhood and mental and physical outcomes in adulthood.</p> <p>(13) The physical environment of the hospital can contribute to people feeling unsafe.</p> <p>(17) Certain events or environments can trigger a physiological and/or psychological response in a person related to their prior trauma. <i>(item labeled question 20 on the posttest)</i></p>
Professional Knowledge	<p>(2) I have a good understanding of the meaning of “trauma-informed care”.</p> <p>(3) - (R) “Trauma” refers to a serious or life-threatening physical injury that causes a patient to seek treatment.</p> <p>(7) I understand the clinical and scientific findings of the Adverse Childhood Experiences (ACEs) study.</p>
Self-Awareness	<p>(6) When working with trauma survivors (physical or emotional), certain triggers may invoke feelings in me not related to my work at hand.</p> <p>(16) I recognize my past trauma experiences may impact the way I interact with others.</p>
Assumptions and Biases	<p>(4) - (R) Individuals who are injured or sick as a result of high-risk behaviors are very likely to return with another injury/illness.</p> <p>(5) - (R) It is not my role to recognize a patient’s previous trauma.</p> <p>(12) - (R) All patients can change their high-risk behavior if they only had the motivation.</p> <p>(15) - (R) I worry that I might upset others by discussing personal stressors.</p>

Table Adapted from Kiss, 2018.

*(R) indicates reverse coding.

Appendix 2. Instrument 2

Subscale	Items
Confidence	<p>(8) I am confident in my ability to interact sensitively with a patient who has a history of traumatic events (childhood sexual abuse, domestic violence, etc.).</p> <p>(9) I am confident knowing how to respond to my patient after recognizing a history of trauma.</p> <p>(14) I can explain what trauma is, including its effects.</p> <p>(1) There is a strong link between childhood trauma and brain development.</p> <p>(7) I understand the clinical and scientific findings of the adverse childhood experiences (ACEs study).</p>
Working with Trauma	<p>(13) the physical environment of the hospital can contribute to people feeling unsafe.</p> <p>(17) certain events or environments can trigger a physiological and/or psychological response in a person related to their prior trauma.</p> <p>(16) I recognize my past trauma experiences my impact the way I interact with others.</p> <p>(6) when working with trauma survivors (physical or emotional), certain triggers may invoke feelings in me not related to my work at hand.</p>
Assumptions and Biases	<p>(11) There is a relationship between trauma experienced in childhood and mental and physical outcomes in adulthood.</p> <p>(5) it is my role to recognize a patient's previous trauma.</p> <p>(12) All patients with high risk behavior lack motivation to change (R).</p> <p>(15) I do not need to worry that I might upset others by discussing personal stressors.</p>

*(R) indicates reverse coding.

Appendix 3. Instrument 3

Subscale	Items
Working with Trauma	<p>(2) There is a strong link between childhood trauma and brain development.</p> <p>(3) It is my role to recognize a patient's previous trauma.</p> <p>(4) When working with trauma survivors (physical or emotional), certain triggers may invoke feelings in me not related to my work at hand.</p> <p>(11) The physical environment of the hospital can contribute to people feeling unsafe.</p> <p>(13) Discussing past traumatic experiences impacts the patient's experience in health care.</p> <p>(14) I recognize my past trauma experiences may impact the way I interact with others.</p> <p>(15) Certain environments can trigger a physiological and/or psychological response in a person related to their prior trauma.</p>
Confidence	<p>(6) I am confident in my ability to interact sensitively with a patient who has a history of traumatic events (childhood sexual abuse, domestic violence, etc.)</p> <p>(7) I am confident knowing how to respond to my patient after recognizing a history of trauma</p> <p>(8) I do feel confident recognizing when someone is re-experiencing a traumatic event.</p> <p>(12) I can explain what trauma is, including its effects.</p>
Knowledge	<p>(1) I have a good understanding about the meaning of "trauma-informed care".</p> <p>(5) I understand the clinical and scientific findings of the Adverse Childhood Experiences (ACEs) study.</p>