Title
Validation of a screening tool for labor and sex trafficking among emergency department patients.

Permalink
https://escholarship.org/uc/item/0v003610

Journal
Journal of the American College of Emergency Physicians open, 2(5)

ISSN
2688-1152

Authors
Chisolm-Straker, Makini
Singer, Elizabeth
Strong, David
et al

Publication Date
2021-10-01

DOI
10.1002/emp2.12558

Peer reviewed
ORIGINAL RESEARCH

Injury Prevention

Validation of a screening tool for labor and sex trafficking among emergency department patients

Makini Chisolm-Straker MD, MPH1 | Elizabeth Singer MD, MPH2,3 | David Strong PhD4 | George T. Loo DrPH, MPA, MPH2 | Emily F. Rothman ScD5 | Cindy Clesca MA2 | James d’Etienne MD, MBA6 | Naomi Alanis MBA, MS6 | Lynne D. Richardson MD7

1 Department of Emergency Medicine, Institute for Health Equity Research, Icahn School of Medicine at Mount Sinai, Mount Sinai Queens, New York, New York, USA
2 Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, New York, USA
3 Department of Medical Education, Icahn School of Medicine at Mount Sinai, New York, New York, USA
4 Herbert Wertheim School of Public Health, University of California San Diego, San Diego, California, USA
5 Community Health Sciences, School of Public Health, Boston University, Boston, Massachusetts, USA
6 Department of Emergency Medicine, Integrative Emergency Services, John Peter Smith Hospital, Fort Worth, Texas, USA
7 Department of Emergency Medicine, Institute for Health Equity Research, Population Health Science & Policy, Icahn School of Medicine at Mount Sinai, New York, New York, USA

Correspondence
Makini Chisolm-Straker, MD, MPH, One Gustave L. Levy Place, Box 1620, New York City, NY 10029, USA.
Email: Makini.Chisolm-Straker@mssm.edu

Meeting: National Conference on Health and Domestic Violence, April 29, 2021 (virtual).

Funding information
Emergency Medicine Foundation Grant and Robert Wood Johnson Foundation
Harold Amos Faculty Development Program, Grant/Award Number: 75200

Abstract

Objective: Patients with labor and sex trafficking experiences seek healthcare while and after being trafficked. Their trafficking experiences are often unrecognized by clinicians who lack a validated tool to systematically screen for trafficking. We aimed to derive and validate a brief, comprehensive trafficking screening tool for use in healthcare settings.

Methods: Patients were randomly selected to participate in this prospective study based on time of arrival. Data collectors administered 5 dichotomous index questions and a reference standard trafficking assessment tool that requires 30 to 60 minutes to administer. Data collection was from June 2016 to January 2021. Data from patients in 5 New York City (NYC) emergency departments (EDs) were used for tool psychometric derivation, and data from patients in a Fort Worth ED were used for external validation. Clinically stable ED adults (aged ≥18 years) were eligible to participate. Candidate questions were selected from the Trafficking Victim Identification Tool (TVIT). The study outcome measurement was a determination of a participant having a lifetime experience of labor and/or sex trafficking based on the interpretation of the reference standard interview, the TVIT.

Results: Overall, 4127 ED patients were enrolled. In the derivation group, the reference standard identified 36 (1.1%) as positive for a labor and/or sex trafficking experience.
experience. In the validation group, 12 (1.4%) were positive by the reference standard. Rapid Appraisal for Trafficking (RAFT) is a new 4-item trafficking screening tool: in the derivation group, RAFT was 89% sensitive (95% confidence interval [CI], 79%–99%) and 74% specific (95% CI, 73%–76%) and in the external validation group, RAFT was 100% sensitive (95% CI, 100%–100%) and 61% specific (95% CI, 56%–65%).

Conclusions: The rapid, 4-item RAFT screening tool demonstrated good sensitivity compared with the existing, resource-intensive reference standard tool. RAFT may enhance the detection of human trafficking in EDs. Additional multicenter studies and research on RAFT’s implementation are needed.

KEYWORDS
commercialized violence, human trafficking, identification, labor trafficking, screening, sex trafficking, validation

1 | INTRODUCTION

1.1 | Background

Human trafficking is the recruitment, harboring, transportation, provision, and/or obtaining of a person, by the use of force, fraud, and/or coercion, for the purpose of labor and/or sexual exploitation. Cases have been reported in all 50 states and Washington, DC. People who have been trafficked seek healthcare both during and after their trafficking experience and can experience trafficking-related health and social consequences for years after a trafficking experience. Clinicians often fail to recognize trafficking experiences among their patients because they lack trafficking-specific training and comprehensive (labor and sex trafficking), validated screening tools.

1.2 | Importance

Multiple healthcare institutions and organizations have developed trafficking screening tools yet only the Child Sex Trafficking Screening Tool is validated for healthcare settings and it is explicitly for sex trafficking screening of adolescents presenting with specific chief complaints. The social, and, in some states, legislative pressure to identify trafficking has led institutions to use unvalidated trafficking screening tools. Unvalidated tools lack sensitivity and specificity with the potential to negatively impact individual patient care and ultimately public health data collection.

1.3 | Goal of this investigation

This study’s objective was to derive and externally validate a comprehensive screening tool, Rapid Appraisal for Trafficking (RAFT), to facilitate adult patient disclosures about labor and sex trafficking experiences.

2 | METHODS

This prospective study’s methods, including site selection, are described in extensive detail in a prior publication. The Mount Sinai Health System and John Peter Smith Hospital institutional review boards deemed the study exempt from review. No identifying information was collected; participants verbally consented, and the findings are reported here following the Standards for Reporting of Diagnostic Accuracy reporting guideline (eTable1 in the Supporting Information).

2.1 | Study population

Clinically stable adult (aged ≥18 years) ED patients seeking care at any of the participating hospitals, speaking any language, were eligible for participation. In the 5 New York City (NYC) EDs (Mount Sinai Hospital, Mount Sinai West, Mount Sinai Morningside, Mount Sinai Beth Israel, Elmhurst Hospital; annual censuses 65,000–107,000 adult visits), patients were randomly recruited based on time of arrival between June 2016 to January 2021. Data collection was paused during the March–August 2020 peak of NYC’s COVID-19 infections. The Fort Worth site (John Peter Smith Hospital) data collection (same eligibility criteria; annual census ≈120,000) took place between May 2018 and March 2020.

The prevalence of human trafficking in a general population is unknown. Study sample size was planned based on preliminary prevalence findings of 1.2% to 1.4% after a year of data collection. Planning for a precision of <0.10 and an instrument that would be at least 80% sensitive to trafficking recognition, enrollment of at least 3667 participants was anticipated.

2.2 | Procedures and measures

The Trafficking Victim Identification Tool (TVIT) was the first validated, comprehensive trafficking assessment tool for use in social service
settings and was used as the reference standard. The index test was composed of 5 candidate RAFT items (eFigure 1 in the Supporting Information). These were dichotomous questions from the TVIT with the highest odds of predicting a trafficking experience on the TVIT. Prefacing, normalizing language was added to build rapport between the data collector and participant; prefacing were adopted from the Human Trafficking Interview and Assessment Measure, a trafficking assessment tool also derived from the TVIT and validated for use only among homeless young adults. Index questions were posed by the data collector, and then the participant completed the reference 30- to 60-minute TVIT interview with the same data collector; interviews were completed in the ED. All participants were offered the opportunity to speak with an ED social worker. Data were entered directly into Research Electronic Data Capture (REDCap), not the electronic health record. Data collectors were members or employees of Mount Sinai Emergency Medicine or John Peter Smith Emergency Medicine research programs or divisions who were trained to interpret TVIT responses. If participants did not complete the index test, their data would not be used for analysis. If the TVIT interview (reference standard) ended early (eg, for healthcare interventions) but a trafficking experience was already recognized, the data would be used for analysis. If the TVIT interview was not completed and trafficking had not yet been identified, the data would not be used for analysis.

Data from patients in 5 EDs in NYC were used for tool derivation; data from the ED in Fort Worth were used for external validation of RAFT. That is to say, the larger data set (5 NYC EDs) was used for derivation, and the smaller data set (1 Fort Worth ED) was used to validate for generalizability. Data from TVIT interviews were used to determine a lifetime experience of trafficking. Data about participant language, gender, and age was captured in the interview (self-report); race, ethnicity, and presenting complaint were self-reported upon registration, and data collectors documented from view of the electronic health record.

2.3 Psychometric analysis

To identify reliable and valid labor and sexual exploitation screening measures, DS (author 3) used innovations in Testlet Response Theory (TRT) to evaluate the following: (1) the performance of items in measuring each of the 5 individual domains (ie, testlets: Force, Fraud, Coercion; Isolation; Labor Exploitation; Harm; Sexual Exploitation) and (2) the performance of items in assessing labor or sexual exploitation experiences. Methods based in TRT allow hierarchical evaluation of multiple subsets of items. Each subset may elaborate a specific content area, but all subset content areas are thought to be related to a larger primary construct. Models provided quantification of each item’s ability to distinguish levels of exploitation (discrimination parameter estimate) and the levels of exploitation associated with each item endorsement (threshold parameter estimates). Before fitting item response models, full information maximum likelihood confirmatory factor analysis (CFA) evaluated fit of models to organize the scales’ items. Model fit indexes including Akaike information criterion (AIC), Bayesian information criterion (BIC), and −2 log likelihood, comparative fit indexes, and root mean square error guided decisions.

The following 4 criteria were established when selecting items for an efficient index of trafficking: (1) minimizing redundancy of the content, (2) ensuring maximum coverage of 5 TVIT domains, (3) selecting items providing strong relationships with overall levels of exploitation, and (4) selecting items that performed similarly (least differential item functioning [DIF]) across examined samples. During DIF analysis, DS examined items across NYC and Fort Worth samples by fitting successive models 1 at a time while using the remaining items to anchor both samples on the same metric. To quantify the difference in parameter estimates in each sample, DS repeatedly (10,000 times) drew a parameter estimate from each sample posterior distribution and subtracted them.

2.4 Statistical analysis

The psychometrically identified items were predicted on the binary outcome of trafficked/not trafficked in a logistic regression model, and a receiver operator curve (ROC) was computed from this model evaluation. Sensitivity, specificity, and positive predictive value performance from participant response to the items were evaluated for effect of increasing score and analyzed by demographics (gender, race/ethnicity, language of interview, age) as planned. These computations were conducted by GTL (author 4) using Statistical Analysis System 9.4 (SAS 9.4) software.

3 RESULTS

3.1 Characteristics of study participants

Of the 6290 eligible participants, 3292 ED patients from the 5 NYC EDs (derivation data set) wanted to participate and completed the TVIT interview (Figure 1). The majority of NYC participants identified as women (61%), and the sample was racially and ethnically diverse.
In the NYC sample, CFA models AIC, BIC, and log likelihood supported the improved fit of the proposed hierarchical model over a unidimensional model or a model with 5 correlated factors (eTable2 in the Supporting Information). In the Fort Worth sample, we also observed an improved fit of the hierarchical model over other models. With support for a hierarchical model, we proceeded to describe each item using a 2-parameter logistic testlet model and performed tests of differences in parameter estimates for the NYC and Fort Worth samples. In the Supporting Information, eTable3 shows the resulting marginal item discrimination and threshold parameters with 95% credible intervals for the NYC and Fort Worth samples.

Of the 5 candidate items, 4 items were identified (Figure 3) from each of the Labor Exploitation, Harm, Sexual Exploitation, and Force TVIT domains (eTable4 in the Supporting Information). Selected items had the strongest relationships with levels of exploitation within each domain and tended to reflect more severe examples of exploitation.

The difference in parameters across settings is presented in eTable2 in the Supporting Information, which also indicates when 95% or more of the comparisons were <0. The “unsafe work” item had slope and threshold parameters that differed in >95% of the comparisons, although absolute differences in parameters suggest that these effects were unlikely to impact overall scores. The relative severity of exploitation reflected by the “forced work” item differed across settings, although again magnitudes of the difference were small.

Of the 4 items ("forced work," "threats at work," and "payment for sex"), 3 were associated with trafficking (eTable5 in the Supporting Information). All 4 items contributed to a robust C-statistic (area under the curve) equal to 0.90 using data in both data sets (eFigure2 in the Supporting Information). Using data in both data sets, affirmation to any 1 of the 4 items yielded a sensitivity of 92% and a specificity of 72% (Table 2). Sensitivity and specificity for planned subgroups (gender, race/ethnicity, language of interview, age) are shown in eTable6 in the Supporting Information; the range in sensitivity (75%–96%) is good to strong throughout the spectrum of stratified demographics.
TABLE 1  Participant demographics

|                                | New York City EDs |                                      | Fort Worth ED |                                      |
|--------------------------------|-------------------|---------------------------------------|--------------|---------------------------------------|
|                                | Not trafficked    | Trafficked                            | Not trafficked| Trafficked                            |
|                                | (n = 3256)        | (n = 36)                              | (n = 823)    | (n = 12)                              |
| Age                            |                   |                                       |              |                                       |
| Median, years                  | 45.0              | 45.0                                  | 53.0         | 49.0                                  |
| 25th percentile                | 30.0              | 28.5                                  | 42.0         | 40.0                                  |
| 75th percentile                | 60.0              | 55.0                                  | 61.0         | 51.5                                  |
| Gender, n (%)                  |                   |                                       |              |                                       |
| Female                         | 1979 (61)         | 17 (47)                               | 380 (46)     | 6 (50)                                |
| Male                           | 1273 (39)         | 19 (53)                               | 443 (54)     | 6 (50)                                |
| Other                          | 4 (0.12)          | 0 (0)                                 | 0 (0)        | 0 (0)                                 |
| Race, n (%)                    |                   |                                       |              |                                       |
| African American/Black         | 1114 (34)         | 11 (31)                               | 313 (38)     | 4 (33)                                |
| American Indian/Alaska Native  | 8 (0.25)          | 0 (0)                                 | 1 (0.12)     | 0 (0)                                 |
| Asian                          | 32 (0.98)         | 0 (0)                                 | 0 (0)        | 0 (0)                                 |
| Native Hawaiian or other Pacific Islander | 2 (0.06) | 1 (3)                          | 1 (0.12)     | 1 (8)                                 |
| White                          | 575 (18)          | 8 (22)                                | 368 (45)     | 6 (50)                                |
| >1 race                        | 17 (0.52)         | 0 (0)                                 | 2 (0.24)     | 0 (0)                                 |
| Other                          | 657 (20)          | 3 (8)                                 | 1 (0.12)     | 0 (0)                                 |
| Unknown                        | 163 (5)           | 2 (6)                                 | 2 (0.24)     | 0 (0)                                 |
| Ethnicity, n (%)               |                   |                                       |              |                                       |
| Hispanic/Latino                | 753 (23)          | 10 (28)                               | 137 (17)     | 1 (8)                                 |
| Country of birth, n (%)        |                   |                                       |              |                                       |
| United States                  | 2478 (76.2)       | 29 (81)                               | 766 (93)     | 11 (92)                               |
| Other country                  | 774 (23.8)        | 7 (19)                                | 57 (7)       | 1 (8)                                 |
| Years of schooling, n (%)      |                   |                                       |              |                                       |
| 1–6 years                      | 122 (4)           | 2 (6)                                 | 22 (3)       | 0 (0)                                 |
| 7–12 years                     | 1189 (37)         | 21 (58)                               | 439 (53)     | 8 (67)                                |
| >12 years                      | 1932 (59)         | 12 (33)                               | 360 (44)     | 4 (33)                                |
| Other                          | 12 (0.37)         | 1 (3)                                 | 2 (0.24)     | 0 (0)                                 |
| Type of trafficking, n (%)     |                   |                                       |              |                                       |
| Labor trafficked               |                    |                                       | 20 (56)      | 4 (67)                                |
| Sex trafficked                 |                    |                                       | 8 (67)       |                                       |

Note: Participants self-identified upon emergency department registration and could select >1 racial and/or ethnic category. Both electronic health record systems use “Hispanic/Latino” rather than the most contemporary and inclusive term, “Latinx.”

**LIMITATIONS**

Although this is the largest study of its kind, given the low prevalence of trafficking experiences, a larger multicenter investigation may offer more information about the proposed tool. In addition, TVIT interrater reliability was not tested; the “raters” were the interviewers and the reference standard interviews were time intensive (30-60 minutes). Reference standard (TVIT) interrater reliability testing would have been too burdensome on patient participants and too resource intensive.

Another study limitation is that patients that were ineligible for participation may have been at higher risk for having a trafficking experience. For example, patients who were not able to consent to participation in research (including patients that presented with intoxication, or substance use disorder or mental illness complications), could not speak with the interviewer alone, or who presented and were dispositioned in the middle of the night may have been at higher risk of exploitation. Data were not collected during peak COVID-19 infection rates, as institutional research activities were halted. These exclusion criteria may have decreased the prevalence of trafficking identified.
**FIGURE 2**  Trafficked participants' chief complaints by city. ED, emergency department; GI, gastrointestinal; SOB, shortness of breath

1. It is not uncommon for people to stay in work situations that are risky or even dangerous, simply because they have no other options. Have you ever worked, or done other things, in a place that made you feel scared or unsafe?

2. In thinking back over your past experience, have you ever been tricked or forced into doing any kind of work that you did not want to do?

3. Sometimes people are prevented from leaving an unfair or unsafe work situation by their employers. Have you ever been afraid to leave or quit a work situation due to fears of violence or threats of harm to yourself or your family?

4. Have you ever received anything in exchange for sex (for example, a place to stay, gifts, or food)?

**FIGURE 3**  RAFT Items
### TABLE 2  Sensitivity and specificity by items with positive responses

| Site                  | No. of positive responses | Sensitivity Estimate 95% CI | Specificity Estimate 95% CI | Positive predictive value Estimate 95% CI | Negative predictive value Estimate 95% CI | Likelihood ratio positive 95% CI | Likelihood ratio negative 95% CI | Likelihood ratio positive 95% CI | Likelihood ratio positive 95% CI |
|-----------------------|----------------------------|----------------------------|----------------------------|------------------------------------------|------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| All sites             | 1                          | 0.92 (0.84-0.99)           | 0.72 (0.70-0.73)           | 0.04 (0.03-0.05)                        | 0.99 (0.99-1.00)                        | 3.22 (2.90-3.54)                | 0.12 (0.01-0.23)                | 2.90 (2.54-3.36)                | 0.12 (0.01-0.23)                |
|                       | 2                          | 0.77 (0.65-0.89)           | 0.91 (0.91-0.92)           | 0.10 (0.07-0.13)                        | 0.99 (0.99-0.99)                        | 9.01 (7.35-10.67)               | 0.25 (0.12-0.38)                | 7.35 (6.70-8.06)                | 0.25 (0.12-0.38)                |
|                       | 3                          | 0.38 (0.24-0.51)           | 0.98 (0.98-0.99)           | 0.20 (0.12-0.29)                        | 0.99 (0.99-0.99)                        | 21.54 (12.24-30.85)             | 0.64 (0.50-0.78)                | 12.24 (8.90-16.63)             | 0.64 (0.50-0.78)                |
|                       | 4                          | 0.23 (0.11-0.35)           | 0.99 (0.99-0.99)           | 0.69 (0.46-0.91)                        | 0.99 (0.99-0.99)                        | 186.95 (163.17-210.22)          | 0.77 (0.65-0.89)                | 186.95 (163.17-210.22)          | 0.77 (0.65-0.89)                |
| New York City sites   | 1                          | 0.89 (0.79-0.99)           | 0.74 (0.73-0.76)           | 0.04 (0.02-0.05)                        | 0.99 (0.99-1.00)                        | 3.43 (2.99-3.88)                | 0.15 (0.01-0.29)                | 2.99 (2.38-3.88)                | 0.15 (0.01-0.29)                |
|                       | 2                          | 0.72 (0.58-0.87)           | 0.92 (0.91-0.93)           | 0.09 (0.06-0.13)                        | 0.99 (0.99-0.99)                        | 9.44 (7.22-11.66)               | 0.30 (0.14-0.46)                | 7.22 (5.96-8.80)                | 0.30 (0.14-0.46)                |
|                       | 3                          | 0.33 (0.18-0.49)           | 0.98 (0.98-0.99)           | 0.21 (0.11-0.32)                        | 0.99 (0.98-0.99)                        | 24.67 (11.17-38.17)             | 0.68 (0.52-0.83)                | 11.17 (3.81-33.17)             | 0.68 (0.52-0.83)                |
|                       | 4                          | 0.19 (0.07-0.32)           | 0.99 (0.99-1.00)           | 0.78 (0.51-1.00)                        | 0.99 (0.98-0.99)                        | 316.56 (169.91 to 803.02)       | 0.81 (0.68-0.94)                | 169.91 (96.74-447.20)          | 0.81 (0.68-0.94)                |
| Fort Worth site       | 1                          | 1.00 (1.00-1.00)           | 0.61 (0.58-0.65)           | 0.04 (0.02-0.06)                        | 1.00 (1.00-1.00)                        | 259 (237.21-281.79)             | 0.00 (0.00 to 0.00)             | 237.21 (216.70-260.72)          | 0.00 (0.00 to 0.00)             |
|                       | 2                          | 0.92 (0.76-1.00)           | 0.88 (0.86-0.90)           | 0.10 (0.04-0.15)                        | 0.99 (0.99-1.00)                        | 7.54 (5.65-9.44)                | 0.09 (0.08 to 0.27)             | 5.65 (4.23-8.14)                | 0.09 (0.08 to 0.27)             |
|                       | 3                          | 0.50 (0.22-0.78)           | 0.97 (0.96-0.98)           | 0.18 (0.05-0.31)                        | 0.99 (0.98-0.99)                        | 15.24 (4.93-25.55)              | 0.52 (0.22-0.81)                | 4.93 (2.55-9.51)                | 0.52 (0.22-0.81)                |
|                       | 4                          | 0.33 (0.07-0.60)           | 0.99 (0.99-1.00)           | 0.57 (0.20-0.94)                        | 0.99 (0.98-0.99)                        | 91.44 (35.13 to 218.02)         | 0.67 (0.40-0.94)                | 35.13 (12.40-99.40)            | 0.67 (0.40-0.94)                |

Abbreviation: CI, confidence interval.
assessment for antitrafficking or other resources and/or interventions. In-depth assessment need not occur in the ED and is likely best performed by local antitrafficking experts, for example, community-based antitrafficking organizations. Likewise, a negative RAFT screen does not rule out a trafficking experience. A patient may not feel comfortable telling their truth to the interviewer, may not have understood the questions, or the trafficking experience may not have been captured by RAFT. Still, trafficking survivor–perspective literature demonstrates that patients appreciate when healthcare teams support their path to well-being by directly engaging on this topic (rather than self-administered surveys).31,32

Psychometric analysis demonstrates that the 4 RAFT questions perform well together, but the ideal administration is not yet known. As a 4-item screener, it takes about 2 minutes to administer, and optimal strategies for where, when, and by whom RAFT should be asked will vary in different EDs. In some sites, triage may be the most private and best setting for these questions; at other sites, the primary nursing assessment may be more appropriate. We anticipate that most of the training on RAFT would be around a site’s protocol for what happens when a patient screens positive.

ACKNOWLEDGMENTS
Special thank you to Dr. Jeffrey Kline for introducing the John Peter Smith team and the Mount Sinai Health System team. RAFT is not possible without the dedicated data collectors: Naomi Alanis, Charles Bell, Reyna Bhandari, Malgorzata Budzynska, Maxime Centeno, Anna Chen, Chelsea Clark, Brendan Daly, Chenée de Ment, Fresa Estevez, Yifan Gao, Daniela Garcia, Bulat Gibadullin, Kelley Grant, Abel Infante, Stephin Jose, Alena Lebron, Simraj Mangat, Natalie Massenburg, Iyesogie Ojo, Andrea Peña, Evelyn Rajan, Stephanie M. Rodriguez, Will Runge, Nkenge Scott, Erisa Shehi, Acacia Smash, Sophia Spadafore, Aman Sunderji, Katherine Thompson, Tina Tran, Samuel Vargas, Kavey Vidal, Kelita Waterton, Albert Williams, and Tamsyn Wombwell. Sincere and deepest appreciation goes to our Rapid Appraisal for Trafficking study participants. Thank you for your time and for trusting us with your stories.

CONFLICT OF INTEREST
This study was supported by an Emergency Medicine Foundation grant and a Robert Wood Johnson Foundation grant (75200; principal investigator, Makini Chisolm-Straker). David Strong, George T. Loo, and Cindy Clesca received salary support or consulting fees for data management or analysis. No other author received consulting fees or honoraria, fees for participation in review activities such as data monitoring boards or statistical analysis, payment for writing or reviewing the manuscript, and/or provision of writing assistance, medicines, equipment, or administrative support in connection with this study.

AUTHOR CONTRIBUTIONS
Makini Chisolm-Straker is the primary investigator for the study, she and Elizabeth Singer, Lynne D. Richardson, George T. Loo, and David Strong conceived of this analysis and designed it together. Cindy Clesca, Naomi Alanis, James d’Etienne managed the data collection. David Strong and George T. Loo managed the analysis. Makini Chisolm-Straker, David Strong, and George T. Loo are the primary authors of the article. All of the authors participated in the revision of the manuscript. Makini Chisolm-Straker takes responsibility for the paper as a whole.

ORCID
Makini Chisolm-Straker MD, MPH https://orcid.org/0000-0001-5182-5772

REFERENCES
1. Victims of Trafficking and Violence Protection Act of 2000 (P.L. 106-386), reauthorized by the Trafficking Victims Protection Reauthorization Act (TVPRA) of 2003 (P.L. 108-193), the TVPRA of 2005 (P.L. 109-164), and the William Wilberforce Trafficking Victims Protection Reauthorization Act (WW-TVPA) of 2008 (P.L. 110-457) and the TVPRA of 2013 (P.L. 113-4).
2. Polaris. 2019 data report: the U.S. National Human Trafficking Hotline. https://humantrafficking hotline.org/sites/default/files/Polaris-2019-US-National-Human-Trafficking-Hotline-Data-Report.pdf Published 2019. Accessed March 24, 2021.
3. Baldwin SB, Eisenman DP, Sayles JN, et al. Identification of human trafficking victims in health care settings. Health Hum Rights. 2011;13(1):E36-E49.
4. Lederer L, Wetzel C. The health consequences of sex trafficking and their implications for identifying victims in healthcare facilities. Annals Health L. 2014;23(1):61-91.
5. Chisolm-Straker M, Baldwin S, Gaïgbé-Togbé B, Ndukwe N, Johnson PN, Richardson LD. Health care and human trafficking: we are seeing the unseen. J Health Care Poor Underserved. 2016;27(3):1220-1233.
6. Zimmerman C, Schenker MB. Human trafficking for forced labour and occupational health. Occ Environ Med. 2014;71(12):807-808.
7. Turner-Moss E, Zimmerman C, Howard LM, Oram S. Labour exploitation and health: a case series of men and women seeking post-trafficking services. J Immigr Minor Health. 2014;16(3):473-480.
8. Macias-Konstantopoulos W, Ma ZB. Physical health of human trafficking survivors: unmet essentials. In: Chisolm-Straker M, Stoklosa H, eds. Human Trafficking Is a Public Health Issue: A Paradigm Expansion in the United States. Cham, Switzerland: Springer International; 2017:185-210.
9. Bespalova N, Morgan J, Coverdale J. A pathway to freedom: an evaluation of screening tools for the identification of trafficking victims. Acad Psychiatry. 2016;40:124.
10. Macias-Konstantopoulos W, Owens J. Adult human trafficking screening tool and guide, administration for children & families. https://www.achhs.gov/sites/default/files/documents/otip/adult_human_trafficking_screening_tool_and_guide.pdf Published 2018. Accessed April 29, 2021.
11. Kaltiso SA, Greenbaum VJ, Agarwal M, et al. Evaluation of a screening tool for child sex trafficking among patients with high-risk child complaints in a pediatric emergency department. Acad Emerg Med. 2018;25:1193.
12. Atkinson HG, Curnin KJ, Hanson NC. US state laws addressing human trafficking: education of and mandatory reporting by health care providers and other professionals. J Human Trafficking. 2016;2:111-138.
13. New York State public health law 2805-y.
14. Scott I. You can’t believe all that you’re told: the issue of unvalidated questionnaires. Injury Prevention. 1997;3:5-6.
15. Chisolm-Straker M, Singer E, Rothman EF, et al. Building RAFT: trafficking screening tool derivation and validation methods. Acad Emerg Med. 2020;27(4):297-304. https://doi.org/10.1111/aeem.13888
16. Simich L, Goyen L, Powell A, Mallozzi K. Improving human trafficking victim identification-validation and dissemination of a
screening tool. https://www.ncjrs.gov/pdffiles1/nij/grants/246712.pdf. Published 2014. Accessed October 21, 2019.
17. Bigelsen J, Vuotto S. Homelessness, survival sex and human trafficking: as experienced by the youth of Covenant House New York. https://humantraffickinghotline.org/sites/default/files/Homelessness%2C%20Survival%2C%20Sex%2C%20and%20Human%20Trafficking%20-%20Covenant%20House%20NY.pdf. Published 2013. Accessed May 13, 2018.
18. Spadafore S, Lane M, Walker J, Jaikaran E, Chisolm-Straker M. Histories of trauma: a qualitative analysis of lifetime traumatic experiences among emergency department patients. Acad Emerg Med. 2021;00:1-10. https://doi.org/10.1111/acem.14346
19. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377-381.
20. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software partners. J Biomed Inform. 2019. https://doi.org/10.1016/j.jbi.2019.103208
21. Wainer H, Bradlow ET, Wang X. Testlet Response Theory and Its Applications. Cambridge UK: Cambridge University Press; 2007.
22. SAS Institute Inc. SAS version 9.4. Cary, NC: SAS Institute Inc; 2013.
23. Wang X, Bradlow ET, Wainer H. A general Bayesian model for testlets: theory and applications. App Psychol Measure. 2002;26:109-128.
24. Wang X, BradlowET, Wainer H, Muller ES. A Bayesian method for studying DIF: a cautionary tale filled with surprises and delights. J Educat Behav Stat 2008;33:363. https://doi.org/10.3102/1076998607306080
25. Marsh E, Anthony B, Emerson J, Mogulescu K. State report cards: grading criminal record relief laws for survivors of human trafficking. https://polarisproject.org/wp-content/uploads/2019/03/Grading-Criminal-Record-Relief-Laws-for-Survivors-of-Human-Trafficking.pdf. Accessed August 14, 2021.
26. Morrow K. Presumptive Treatment of Sexually Transmitted Infections and Syndromic Management of Genitourinary Infections in Trafficked Women and Girls. Kosovo: Doctors of the World - USA; 2005.
27. Polaris. https://humantraffickinghotline.org/. Accessed September 14, 2021.
28. Shandro J, Chisolm-Straker M, Duber HC, et al. Human trafficking: a guide to identification and approach for the emergency physician. Ann Emerg Med. 2016;68(4):P501-508.E1. https://doi.org/10.1016/j.annemergmed.2016.03.049.
29. Chang KSG, Marjavi A. Protocol for HRSA-supported community health centers to engage patients through universal education approaches on exploitation, human trafficking, domestic violence and intimate partner violence. Health Partners on IPV + Exploitation. Futures Without Violence; 2021. https://ipvhealthpartners.org/wp-content/uploads/2021/07/FUTURES-CHC-Protocol-June-30-2021-FINAL.pdf. Accessed September 14, 2021.
30. Baldwin SB, Barrows J, Stoklosa H, 2017. Protocol toolkit for developing a response to victims of human trafficking in health care settings. heal trafficking and hope for justice. https://healtrafficking.org/2017/06/protocol-toolkit/. Accessed March 14, 2021.
31. Wallace C, Schein Y, Carabelli G, et al. A survivor-derived approach to addressing trafficking in the pediatric ED. Pediatrics. 2021;147(1):e20200772.
32. Chisolm-Straker M, Miller CL, Duke G, Stoklosa H. A framework for the development of healthcare provider education programs on human trafficking part two: survivors. J Human Traffic. 2019.

AUTHOR BIOGRAPHY

Makini Chisolm-Straker, MD, MPH, is an Associate Professor of Emergency Medicine at the Icahn School of Medicine at Mount Sinai in New York, NY, USA.

SUPPORTING INFORMATION
Additional supporting information may be found in the online version of the article at the publisher’s website.

How to cite this article: Chisolm-Straker M, Singer E, Strong D, et al. Validation of a screening tool for labor and sex trafficking among emergency department patients. JACEP Open. 2021;2:e12558. https://doi.org/10.1002/emp2.12558