RESEARCH

Reliability and Validity of the Japanese Version of the Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale

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BACKGROUND: Trauma-informed care is recommended to avoid the inadvertent retraumatization of patients by health care providers. Psychometric evaluation of trauma-informed care instruments is needed. The Japanese version of the Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale has not yet been psychometrically validated.

OBJECTIVE: The study's objective was to examine the reliability and validity of the ARTIC-10.

METHODS: This psychometric study of the ARTIC-10 compared with five other scales associated with attitudes related to trauma-informed care used a cross-sectional survey design conducted in November 2020 with a convenience sample of Japanese physicians and nurses recruited from an internet research agency. Participants completed self-administered questionnaires including the (a) ARTIC-10; (b) the Japanese version of the Moral Sensitivity Questionnaire 2018; (c) Patient Health Questionnaire-9; (d) Generalized Anxiety Disorder-7; (e) Stress Underestimation Beliefs; and (f) Negative Acts Questionnaire-Revised. Cronbach’s α measured reliability internal consistency, and construct validity was measured by Spearman’s rank.

RESULTS: A total of 794 physicians and nurses completed the surveys. Cronbach’s α value of ARTIC-10 was 0.56. Higher scores of ARTIC-10 were positively and significantly correlated with Moral Sensitivity Questionnaire 2018 and negatively and significantly correlated with other scales (r = −.12 to .30).

CONCLUSION: This study found only modest internal consistency and construct validity of the Japanese version of ARTIC-10 in physicians and nurses. Further study is needed to identify factors that affect the reliability and validity of this Japanese scale to improve its psychometric properties.

KEY WORDS: ARTIC-10, Attitudes Related to Trauma-Informed Care Scale, Psychometric analysis, Reliability, Scale, Trauma, Trauma-informed care, Validity

Cite as: Kataoka, M., Kotake, R., Asaoka, H., Miyamoto, Y., & Nishi, D. (2022). Reliability and validity of the Japanese version of the Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale. Journal of Trauma Nursing, 29(6), 312-318. https://doi.org/10.1097/JTN.0000000000000684

A dverse childhood experiences and trauma are a public health problem because of their high prevalence and association with poor health outcomes (Norman et al., 2012; Teicher & Samson, 2016). Service providers should develop supportive and effective services to avoid the re-traumatization of service users who have experienced trauma (Bateman et al., 2013; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). Trauma-informed care (TIC) is defined as a strengths-based service delivery approach to make chances for trauma survivors to recover the senses of control and empowerment based on the understanding and responsiveness

Dates: Submitted May 29, 2022; Revised August 24, 2022; Accepted, August 24, 2022.

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This work was supported by Health Labour Sciences Research grant (20GC1021 to DN).

Daisuke Nishi reports personal fees from Startia, Inc., en-power, Inc., MD.net, AIG General Insurance Company, Ltd, outside the submitted work.

This study was approved by the Ethics Committee of The University of Tokyo Graduate School of Medicine and School of Medicine (2020237NI).

The authors declare no conflicts of interest.

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to the influence of trauma with the emphasis on physical, psychological, and emotional safety for both providers and survivors (Hopper et al., 2010). Implementing TIC led to positive health outcomes such as well-being (Marsac et al., 2016) and reduced stress levels (Schmid et al., 2020) in health and human services settings. Psychometrically robust instruments need to be developed and validated to evaluate, improve, and cause to become widely known TIC. One of the most used instruments is the Attitudes Related to Trauma-Informed Care (ARTIC) Scale, which was developed to evaluate the TIC relevant attitudes of staff working in the settings serving individuals with histories of trauma (Baker et al., 2016; Baker et al., 2021). Previous studies confirmed the reliability and the validity of the original version of ARTIC, which has been used increasingly in western countries (Black et al., 2022; Parker et al., 2020; Schneider et al., 2022). The short version of ARTIC (ARTIC-10) was also developed to increase the feasibility of ARTIC’s administration and has been widely used in research.

The TIC research and practice are viewed as important in Japan, especially for health care workers in medical settings (Niimura et al., 2019) because TIC would prevent retraumatization of patients, and continuous assessment of the ability and practice of TIC among health care workers would be helpful to implement and improve TIC. Therefore, more practical instruments are needed to evaluate TIC, such as ARTIC-10. Thus far, the reliability and the validity of the Japanese version of ARTIC have not been confirmed.

**KEY POINTS**

- Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale is one of the most widely used scales to assess trauma-informed care.
- This is the first study to examine the internal consistency and construct validity of the Japanese version of ARTIC-10.
- The Japanese version of ARTIC-10 demonstrates modest internal consistency and demonstrates evidence of construct validity.

**OBJECTIVE**

This study aimed to confirm the reliability and the validity of the Japanese version of ARTIC-10 in a sample of physicians and nurses.

**METHODS**

**Participants**

We recruited 1,000 physicians and nurses through a large internet research agency (Rakuten Insight Inc., Tokyo, Japan). Rakuten Insight Inc. is a research agency that managed a survey panel of approximately 2.2 million registered individuals in 2019. Individuals who consented to participate in the survey accessed the designated website and responded to questionnaires in November 2020. A credit point that could be used for internet shopping and cash conversion was provided for participants with an incentive. The inclusion criteria were (1) individuals 18 years of age or older and (2) physicians and nurses working in Japan. We excluded nonphysicians and nurses (e.g., administrative staff in hospitals). Finally, data from 794 physicians and nurses (response rate = 79.4%) were included in the analyses. The Ethics Committee at The University of Tokyo Graduate School of Medicine and School of Medicine approved this study (2020237NI).

**Measurements**

**Demographic Variables**

The demographic variables assessed included gender, age, marital status, educational level, job category, and years of work experience.

**Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale**

The Attitudes Related to Trauma-Informed Care (ARTIC-10) Scale is the short version of ARTIC-45, which includes 45 items assessing attitudes toward TIC implementation and support of TIC adoption in human service organizations (Baker et al., 2016; Baker et al., 2021). The ARTIC-45 includes seven subscales (five core and two supplementary subscales). The ARTIC-10 comprises 10 items reflecting five core subscales within ARTIC-45: (a) underlying causes of problem behavior and symptoms; (b) responses to problem behavior and symptoms; (c) on-the-job behavior; (d) self-efficacy at work; and (e) reactions to the work. These five core subscales (a–e) evaluate attitudes toward TIC implementation.

Respondents were asked to rate their personal beliefs about TIC during the past 2 months at their job on a 7-point bipolar Likert scale. Sample bipolar question measuring favorable attitudes to TIC is, “I am most effective as a helper when I focus on a client’s strength,” whereas its opposite is, “I am most effective as a helper when I focus on a client’s problem behavior.” The mean scores of overall items are calculated to determine the participants’ average attitude toward TIC. The mean ARTIC-10 total scores range from 1 to 7, with higher scores indicating a more favorable attitude toward TIC. The original version of ARTIC-10 has shown good internal consistency (α = .82; Baker et al., 2016), (α = .81; Baker et al., 2021), and moderate construct validity (Familiar with TIC: r = .30–.38, Staff level indicators of TIC: r = .30–.58; Baker et al., 2016), (Familiar with TIC: r = .34, Knowledge about TIC: r = .38; Baker et al., 2021) among participants who worked human services...
health care, or education settings. The Japanese version of the ARTIC-10 scale was previously created using back-translation (Niimura et al., 2019).

Other Measures
The construct validity of ARTIC-10 was tested against five other scales. We selected these scales, which were considered to be associated with an attitude related to TIC, based on previous validation studies about the original version of the ARTIC (Baker et al., 2016; Baker et al., 2021), the concept of TIC, and six key principles of a trauma-informed approach (SAMHSA, 2014), provided that the scales were previously validated.

The Japanese Version of the Moral Sensitivity Questionnaire 2018
The Japanese Version of the Moral Sensitivity Questionnaire 2018 (J-MSQ 2018) is a self-administered questionnaire developed to measure moral sensitivity (Maeda & Konishi, 2012; Maeda et al., 2019). The reliability and validity were confirmed in a sample of Japanese nurses (α = .82). It consists of 10 items, each scored on a 5-point scale (from 1 (not applicable) to 5 (total agreement)), with the values ranging from 10 to 60 points. Higher scores indicate more moral sensitivity.

Patient Health Questionnaire-9
The Patient Health Questionnaire-9 (PHQ-9) is a self-administered questionnaire developed and validated to assess depression (Muramatsu et al., 2007). The questionnaire comprises nine items scored on a 4-point scale (0–3). A participant’s score can range from 0 to 27, with higher scores indicating more depressive symptoms.

Generalized Anxiety Disorder-7
The Generalized Anxiety Disorder-7 (GAD-7) consists of seven items assessing the frequency of symptoms of anxiety occurred in the last 2 weeks on a scale from 0 (not at all) to 3 (nearly every day). Higher scores indicate more severe symptoms of anxiety. The reliability and validity have been confirmed (Muramatsu et al., 2009).

Stress Underestimation Beliefs
The Stress Underestimation Beliefs (SUB) is a self-administered questionnaire developed to measure Japanese SUB (Izawa et al., 2013). The reliability and validity were confirmed in a sample of the Japanese civilian population aged 30 through 65 years (α = .85). It consists of 12 items scored on a 4-point scale from 1 (not applicable) to 4 (applicable). The total score takes a value from 12 to 48 points. Higher scores indicate more SUB.

Negative Acts Questionnaire-Revised
The Negative Acts Questionnaire-Revised (NAQ-R) is a self-administered questionnaire developed to measure workplace bullying and the frequency with which the participants experienced it during the previous 6 months (Tsuno et al., 2010). The reliability and validity were confirmed in a sample of Japanese civil servants (α: male = .95, female = .91). It consists of 23 items measured on a 5-point scale with response categories never, now and then, monthly, weekly, and daily. The total score takes a value from 23 to 115 points. Higher scores indicate experiencing more workplace bullying. In this study, we could not use two items that asked about violence or abuse in the workplace and perception of workplace bullying because these questions were judged as too sensitive, and the research agency refused to include them. We used 21 items of NAQ-R and calculated the total score that could have ranged from 21 to 105 points in this study.

Hypotheses
We hypothesized the correlations ARTIC-10 and other measures as followings: ARTIC-10 would positively correlate with J-MSQ 2018 because moral sensitivity is defined as a genuine concern for the welfare of the other, which we experience as “caring” about the other (Lützen et al., 2006), and is similar to the concept of TIC, defined as the response to resist retraumatization of trauma survivors by integrating knowledge about trauma into practices (SAMHSA, 2014); ARTIC-10 would negatively correlate with PHQ-9 and GAD-7 because a previous study showed that higher scores of ARTIC-10 negatively correlated with burnout (r = −.28, p < .01) and secondary traumatic stress (r = −.25, p < .01; Baker et al., 2021); ARTIC-10 would negatively correlate with SUB because a previous study showed that respondents suffering from stress-related diseases tended to have more SUB (Izawa et al., 2012); ARTIC-10 would negatively correlate with NAQ-R because one of the key principles of TIC is the safety of health care workers (SAMHSA, 2014), and the presence of bullying means the absence of psychological safety.

Statistical Analysis
To examine the internal consistency reliability, Cronbach’s α coefficient was calculated for the Japanese version of ARTIC-10. To assess construct validity, Spearman’s rank correlation coefficients were calculated between the total score of ARTIC-10 and five variables: indicators of bullying (NAQ-R), moral sensitivity (J-MSQ2018), SUB, and two health measures (PHQ-9 and GAD-7). We used Spearman’s rank correlation coefficients because the normality test indicated that the scores were not distributed normally. The significance level was set on .05.
We did not conduct confirmatory factor analysis because a previous validation study confirmed a one-factor structure of the original ARTIC-10 (Baker et al., 2021). All analyses were performed using Stata 16.1 (StataCorp, College Station, TX).

**RESULTS**

**Characteristics of the Participants**

A total of 794 participants were studied, of whom 362 (45.6%) were male, 432 (54.4%) were female, 286 (36.0%) were doctors, and 508 (64.0%) were nurses. The median age and years of work experience were median = 42 (interquartile range [IQR], 34–52) and median = 16 (IQR, 9–25), respectively (Table 1).

**Reliability of ARTIC-10**

As shown in Table 2, Cronbach’s α coefficient of ARTIC-10 was 0.56, indicating that the internal consistency reliability was not quite acceptable compared with the original version of ARTIC-10.

**Construct Validity of ARTIC-10**

As shown in Table 3, higher ARTIC-10 score was significantly positively correlated with J-MSQ 2018 ($r = .32, p < .001$) and significantly negatively correlated with NAQ-R ($r = -.14, p < .001$), SUB ($r = -.17, p < .001$), and psychological distress (PHQ-9: $r = -.12, p < .001$; GAD-7: $r = -.14, p < .001$). Although the results were concordant with our hypotheses, the correlations were lower than the original version of ARTIC-10.

**DISCUSSION**

The study’s findings showed that the Japanese version of ARTIC-10 has only modest internal consistency reliability and construct validity, with both values being lower than the original version. Cronbach’s α value of the ARTIC-10 was 0.56. The reliability was

| Variables | n | % | M | SD | Median | IQR |
|-----------|---|---|---|----|--------|-----|
| Gender    |   |   |   |    |        |     |
| Female    | 432 | 54.4 | | | | |
| Male      | 362 | 45.6 | | | | |
| Age       | 43.1 | 11.2 | 42 | 42 (34–52) | | |
| Marital status | | | | | | |
| Married, common-law marriage | 516 | 65.0 | | | | |
| Never married, widowed, divorced | 278 | 35.0 | | | | |
| Educational level | | | | | | |
| High school graduate | 56 | 7.1 | | | | |
| Two-year college graduate | 247 | 31.1 | | | | |
| Bachelor’s degree | 204 | 25.7 | | | | |
| Master’s or doctoral degree | 200 | 25.1 | | | | |
| Other | 87 | 11.0 | | | | |
| Job category | | | | | | |
| Doctor | 286 | 36.0 | | | | |
| Nurse | 508 | 64.0 | | | | |
| Years of work experience | 17.6 | 10.4 | 16 | 16 (9–25) | | |
| ARTIC-10* | 4.3 | 0.6 | 4.2 | 4.2 (4–4.7) | | |
| J-MSQ 2018 | 37.5 | 10.5 | 39 | 39 (32–44) | | |
| PHQ-9 | 4.1 | 5.4 | 2 | 2 (0–6) | | |
| GAD-7 | 3.0 | 4.5 | 1 | 1 (0–4) | | |
| SUB | 27.6 | 7.7 | 27 | 27 (22–32) | | |
| NAQ-R | 27.9 | 13.1 | 22 | 22 (21–27) | | |

Note: ARTIC-10 = The short version of Attitudes Related to Trauma-Informed Care Scale; GAD-7 = Generalized Anxiety Disorder-7; IQR = interquartile range; J-MSQ 2018 = The Japanese version of Moral Sensitivity Questionnaire 2018; NAQ-R = Negative Acts Questionnaire-Revised; PHQ-9: Patient Health Questionnaire-9; SUB = Stress Underestimation Beliefs.

*The score of ARTIC-10 is calculated by dividing the total sums of all items by 10.
lower than in the previous study (α = .82; Baker et al., 2016, and α = .81; Baker et al., 2021), probably because only about 40% of participants chose response option 4 (midpoint) for most items (Table 4). For this reason, covariances between items of ARTIC-10 were smaller than in the previous study, which decreased Cronbach’s α. The possible reason is the central tendency bias. Previous study found that Japanese people are more likely to choose a midpoint response than Western people (Tasaki & Shin, 2017). Japanese communication’s social and cultural characteristics that discourage self-assertion may have affected the responses (Yonemura & Matsuda, 1991).

In addition, ARTIC-10 uses a bipolar Likert scale. Questions about morals and social responsibility are more likely to produce social desirability bias (Streiner et al., 2015). Nevertheless, the respondents might not be able to judge which response on the bipolar scale would be socially desirable for each item of ARTIC-10, which minimizes the risk of socially desirable responses (Woods & Hampson, 2005). Therefore, they might be more likely to choose a midpoint response. A bipolar Likert scale style might encourage Japanese people to choose a midpoint response. As a result, covariances between items of ARTIC-10 of the Japanese version might be smaller than interitem covariances in the original version. Some studies have examined various methods to avoid the central tendency bias in scales (e.g., omitting the midpoint or increasing the number of rating steps; Matell & Jacoby, 1972; Weems & Onwuegbuzie, 2001). Further study is needed to evaluate whether taking measures to avoid the central tendency bias response will improve the reliability of ARTIC-10.

The total score of ARTIC-10 positively correlated with J-MSQ2018. This finding is consistent with a previous study that reported a modest correlation between the total score of the ARTIC-10 and moral sensitivity (e.g., willing to be flexible and individualize: r = .44, p < .05; feel connected to patients: r = .45, p < .05; Baker et al., 2016). The total score on the ARTIC-10 negatively correlated with SUB, NAQ, PHQ-9, and GAD-7. This finding is aligned with a previous study that reported a modest correlation of the total score of the ARTIC-10 with burnout (r = −.28, p < .01) and secondary traumatic stress (r = −.25, p < .01; Baker et al., 2021). Despite modest correlations, these findings support the construct validity of the Japanese version of ARTIC-10. The moderate internal consistency might affect these modest associations (Streiner et al., 2015).

### Table 2. Reliability of ARTIC-10 and Other Scales of Psychological Distress (n = 794)

| Scales          | α  |
|-----------------|----|
| ARTIC-10        | .56|
| J-MSQ 2018      | .94|
| PHQ-9           | .92|
| GAD-7           | .94|
| SUB             | .91|
| NAQ-R           | .98|

Note: ARTIC-10 — The short version of Attitudes Related to Trauma-Informed Care Scale; GAD-7 — Generalized Anxiety Disorder-7; J-MSQ 2018 — The Japanese version of Moral Sensitivity Questionnaire 2018; NAQ-R — Negative Acts Questionnaire-Revised; PHQ-9 — Patient Health Questionnaire-9; SUB — Stress Underestimation Beliefs.

### Table 3. Spearman’s Rank Correlation Coefficients Between the Total Score of ARTIC-10 and Other Scales (n = 794)

| Scales          | r    | p     |
|-----------------|------|-------|
| J-MSQ 2018      | .30  | <.001 |
| PHQ-9           | -.12 | <.001 |
| GAD-7           | -.14 | <.001 |
| SUB             | -.17 | <.001 |
| NAQ-R           | -.14 | <.001 |

Note: ARTIC-10 — The short version of Attitudes Related to Trauma-Informed Care Scale; GAD-7 — Generalized Anxiety Disorder-7; J-MSQ 2018 — The Japanese version of Moral Sensitivity Questionnaire 2018; NAQ-R — Negative Acts Questionnaire-Revised; PHQ-9 — Patient Health Questionnaire-9; SUB — Stress Underestimation Beliefs.

### LIMITATIONS

This study has some limitations. First, this study employed an internet survey, likely affected by sampling bias. Participants were extracted from individuals registered as monitors of the research agency who agreed to participate. Participants concerned with TIC, quality of care for patients, and trauma would be more likely to respond to the survey, which could have resulted in higher-scale scores. The generalizability may be limited. Second, this study was conducted during the COVID-19 pandemic. In Japan, the second wave of coronavirus began in July 2020, and the number of people infected with novel coronavirus per day marked a record high on November 18, 2020 (2,201 per day; Ministry of Health, Labour and Welfare, n.d.). A previous study revealed that Japan’s health care workers experienced considerable psychological strain due to the COVID-19 pandemic (Matsuo et al., 2020). That could have resulted in an overestimation of psychological distress.

### CONCLUSION

This study found the modest internal consistency and construct validity of the Japanese version of ARTIC-10 in a sample of physicians and nurses. These
values were lower compared with those in the original version. Further study is needed to identify factors that affect the reliability and validity of this Japanese scale to improve its psychometric properties.

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| Items | Item No. | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|---------|---|----|---|---|---|---|---|---|---|---|
| Underlying causes of problem behavior and symptoms | 1 | 4.1 | 1.3 | 26 (3.2) | 61 (7.7) | 142 (17.9) | 300 (37.8) | 154 (19.4) | 88 (11.1) | 23 (2.9) |
| | 6 | 4.1 | 1.2 | 9 (1.1) | 56 (7.1) | 132 (16.6) | 345 (43.5) | 159 (20.0) | 68 (8.6) | 25 (3.1) |
| Responses to problem behavior and symptoms | 2 | 4.6 | 1.2 | 6 (0.7) | 18 (2.3) | 77 (9.7) | 328 (41.3) | 189 (23.8) | 133 (16.8) | 43 (5.4) |
| | 7 | 3.9 | 1.2 | 24 (3.0) | 75 (9.5) | 147 (18.5) | 341 (42.9) | 149 (18.8) | 49 (6.2) | 9 (1.1) |
| On-the-job behavior | 3 | 4.3 | 1.4 | 28 (3.5) | 48 (6.0) | 106 (13.4) | 284 (35.8) | 155 (19.5) | 122 (15.4) | 51 (6.4) |
| | 8 | 4.7 | 1.2 | 8 (1.0) | 14 (1.8) | 73 (9.2) | 285 (35.9) | 187 (23.6) | 156 (19.6) | 71 (8.9) |
| Self-efficacy at work | 4 | 4.3 | 1.3 | 18 (2.3) | 40 (5.0) | 85 (10.7) | 317 (39.9) | 189 (23.8) | 111 (14.0) | 34 (4.3) |
| | 9 | 4.5 | 1.1 | 9 (1.1) | 23 (2.9) | 75 (9.4) | 323 (40.7) | 220 (27.7) | 114 (14.4) | 30 (3.8) |
| Reactions to the work | 5 | 4.5 | 1.3 | 14 (1.8) | 31 (3.9) | 85 (10.7) | 313 (39.4) | 183 (23.0) | 122 (15.4) | 46 (5.8) |
| | 10 | 4.3 | 1.2 | 7 (0.9) | 36 (4.5) | 113 (14.2) | 338 (42.6) | 173 (21.8) | 93 (11.7) | 34 (4.3) |

*Scoring some items (2, 4, 6, 8, and 9) were reversed.

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