Measures of Psychosocial Stress and Stressful Exposures

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INTRODUCTION

This article presents a summary of selected self-report measures that are considered most relevant to the assessment of psychological stress among adult patients and research participants in the context of rheumatology clinical and/or research practice (Table 1). Measures that accurately capture stress exposures and perceptions are relevant to the rheumatology community for several reasons. First, patients with rheumatic conditions frequently identify stressful events as triggers for disease flares or worse symptoms burden (1). Second, there is growing evidence that psychosocial stress may confer increased risk of developing autoimmune conditions or more severe/active disease among patients who have already been diagnosed. For example, prior studies have shown an association of daily stressors and stress vulnerability with changes in stress hormones and worse disease severity among patients with rheumatoid arthritis (2–6). There is also data from large national cohort studies that demonstrate independent associations of prior trauma and trauma-related disorders such as posttraumatic stress disorder (PTSD) with subsequent incident rheumatoid arthritis and systemic lupus erythematosus, even after adjusting for important covariates such as race, socioeconomic status (SES), and health-related behaviors (7–9). Third, there is biologic plausibility to support a link between stress and autoimmune conditions, given the known effects of physiologic stress response systems such as the hypothalamic-pituitary-adrenal axis on inflammatory pathways (10).

In order to capture its multidimensional nature, a thorough assessment of psychological stress is best captured with multiple validated instruments that collectively measure both stressful exposures and stress perceptions. This review therefore addresses measures designed to capture exposure to specific stressful events as well as the individual’s appraisal of them, and it includes the following instruments: the Adverse Childhood Experiences (ACE) Questionnaire, the Trauma History Questionnaire (THQ), the Life Events List (LEL), and the Perceived Stress Scale (PSS). Instruments included in this review were selected to cover the following four major types of stress: stress experienced during childhood, prior exposure to trauma, exposure to general (nontraumatic) life events, and the respondents’ appraisal of the degree to which their life circumstances are stressful. For each of the four types of stress, we selected the instrument that would be most reliable and useful based on several criteria, including whether prior studies have demonstrated adequate psychometric performance, prior use in clinical research, availability of normative data, associated burden to respondents (time to complete), and ease of scoring/interpretation (Tables 1 and 2). In most cases, we were not able to identify a single instrument that performs well on all criteria considered, in which case we selected instruments with favorable performance across most of the criteria.

This review is not intended to be exhaustive; it focuses on self-report measures and does not include measures of physiologic stress or stress biomarkers. Although two of the instruments we reviewed query respondents regarding prior exposure to trauma, they are not intended to diagnose or treat trauma-related conditions such as PTSD. The decision to diagnose a psychiatric illness should be made by trained mental health professionals and is beyond the scope of this review. Finally, given the sensitive nature of the questions included in several of the instruments, some respondents may experience and express an emotional response while answering them. Therefore, if used as part of a research study, we recommend that investigators provide study interviewers with a protocol and script to reference in the event that respondents express emotional distress while answering questions, including contact information for appropriate mental health resources.

PERCEIVED STRESS SCALE

Description

Purpose. To measure general stress perceptions and the degree to which situations in one’s life are appraised as stressful.

Content or domains. Items assess the respondent’s global level of perceived stress over the last month, including the degree to which they find life unpredictable, uncontrollable, and overloading (11).
**Number of items.** The original version of the PSS includes 14 items. There are two validated iterations with ten items and four items, respectively.

**Response options/scale.** Five-point scale in which 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, and 4 = very often.

**Score range.** For the 14-item PSS form (PSS-14), scores range from 0 to 56; for the ten-item PSS form (PSS-10), scores range from 0 to 40; and for the four-item PSS form (PSS-4), scores range from 0 to 16.

**Recall period for items.** The past month.

**Cost to use.** The PSS is free to use. Permission for use is not necessary when use is for nonprofit academic research or nonprofit educational purposes.

**How to obtain.** The PSS-14 can be found in Appendix A of the original publication by Cohen et al (11). The PSS-4 and PSS-10 are available for download at the following URL: https://www.cmu.edu/dietrich/psychology/stress-immunity-disease-lab/scales/index.html.

**Practical application**

**Method of administration.** Easily self-administered or administered by an interviewer. Can be administered in person, in written or interview format, by telephone interview, or by mail.

**Scoring.** PSS scores are obtained by reversing the scores on the positive items (0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0) and then summing across all items. For the PSS-14, items 4 to 7, 9 to 10, and 13 are the positively stated items.

**Score interpretation.** Higher scores indicate greater perceived stress. The PSS was not developed to be used as a diagnostic instrument, and there are no score cutoffs, only comparisons within the study sample. Normative data exist for the PSS-4, PSS-10, and PSS-14 from 2387 respondents in a US probability sample collected by the Harris Poll in 1983, including mean and SD scores by sex, occupation, income, race, and ethnic background (12). The mean (SD) scores for the PSS-14 by sex were 18.8 (6.9) for men and 20.2 (7.8) for women; the PSS-10 scores were 12.1 (5.9) for men and 13.7 (6.6) for women. More recent national normative data for the PSS-10 are available from questionnaires administered in 2006 and 2009, which showed greater reported stress among women, younger adults, and those of lower SES (13).

**Respondent time to complete.** Approximately 5 minutes.

**Administrative burden.** Training to administer: Minimal. Equipment needed: When self-administered, a pencil or pen are needed to complete.

**Time to score.** Five minutes or fewer.

**Translations/adaptations.** There are two abbreviated adaptations that were developed and validated by Dr. Sheldon Cohen. The PSS-10 (12,13) has become the most commonly used adaptation; and the PSS-4 (11) can be made from questions 2, 4, 5, and 10 of the PSS-10 item scale. The questionnaire has been translated in at least 25 languages, many of which are available for download (https://www.cmu.edu/dietrich/psychology/stress-immunity-disease-lab/scales/index.html).

**Psychometric information**

**Floor and ceiling effects.** Floor and ceiling effects were not pretested during original development, but subsequent studies of other samples have indicated negligible ceiling or floor effects (14).

**Reliability.** Internal consistency. Cronbach’s $\alpha$ correlations for the PSS-14 from samples tested in the original publication were high ($r = 0.84-0.86$) (11). A meta-analysis of the PSS psychometric properties found that Cronbach’s $\alpha$ was greater than 0.70 (the established cutoff for minimum measure of internal consistency) for both the PSS-14 and PSS-10 in all studies in which it was evaluated. In contrast, the reported Cronbach’s $\alpha$ was below the acceptable cutoff in half of the six studies in which the PSS-4 was evaluated (15).

Test-retest reliability. Correlations over 2 days ($r = 0.85$) and 4 weeks suggest that PSS scores reflect stable individual differences during short time intervals, whereas the test-retest reliability was not satisfactory when studied over an interval of 6 weeks ($r = 0.55$).

**Validity.** There is no established gold standard for the PSS, which complicates the ability to assess validity. The PSS was strongly correlated with the mental component of health status as measured by the Medical Outcomes Study Short Form 36 (16). In the original publication, Cohen et al reported that the PSS-14 “correlated in the expected manner with a range of self-report and behavioral criteria” (11).

**Responsiveness.** The PSS-10 has been found to correctly classify patients as improved or unchanged according to the patient’s own judgement (17).

**Minimally important differences.** In a study of the Danish version of the PSS-10 tested among Danish people with work-related stress, the estimates for minimal clinically important
change were 11 points for the absolute change score and 28% for the relative change score (17).

**Use in clinical trials.** The PSS has been used to measure changes in self-report stress in a variety of nonpharmacologic stress-reduction interventions, including mindfulness interventions for caregivers (18–20), and as a secondary outcome in a physical activity intervention for fibromyalgia (21).

**Critical appraisal of overall value to the rheumatology community**

**Strengths.** The PSS is easy to use and requires relatively minimal time from respondents. It has established acceptable psychometric properties and normative data from large samples of US residents.

**Caveats and cautions.** The PSS may not be generalizable to certain patient populations, including those with less education (less than a high school degree) and under-represented racial/ethnic groups. Although the psychometric properties were favorable for the PSS-14 and PSS-10, the internal consistency of the PSS-4 was only marginally acceptable.

**Clinical usability.** The PSS has unclear application in clinical practice because no established cutoffs have been developed to predict subsequent development of clinical psychiatric disorders or differential health outcomes.

**Research usability.** The PSS is useful for research studies that aim to measure appraised stress in relationship to treatments and/or clinical outcomes among patients with rheumatic conditions. Given the widespread use of the PSS in prior stress research and the presence of normative data, there is an ability to compare scores observed in future studies with data from a variety of clinical and healthy populations.

**ADVERSE CHILDHOOD EXPERIENCES QUESTIONNAIRE**

**Description**

**Purpose.** To measure the incidence of different types of traumatic exposure during childhood (first 18 years of life).

**Content or domains.** The items assess prior history of physical, emotional, and sexual abuse; neglect; domestic violence; and dimensions of household dysfunction, ranging from exposure to substance abuse and mental illness to parental separation and divorce.

**Number of items.** The most common version of the ACE tool is 10 items; however, several other versions exist. For example, in 2018, the World Health Organization created the ACE-International Questionnaire (ACE-IQ) to better capture exposures that occur in low- and middle-income countries, including community violence. The ACE-IQ includes 29 items (22).

**Response options/scale.** Dichotomous (yes/no).

**Recall period for items.** Varies by version. The adult version is an individual self-report of exposures during the first 18 years of life. However, versions that utilize parent/caregiver report also exist to assess exposure among minors; those versions query caregivers regarding the period from birth until the present in the dependent’s life.

**Cost to use.** The ACE Questionnaire is free to use.

**How to obtain.** We recommend the current Adverse Childhood Events Revised Questionnaire, which can be found at the following URL: https://www.acesaware.org/screen/screening-tools/.

**Practical application**

**Method of administration.** Written, paper and pencil, interviewer, and computer-based administration.

**Scoring.** Scores range from 0 to 10 on the standard ACE Questionnaire.

**Score interpretation.** Higher scores indicate more exposure to different adverse events in the first 18 years of life.

**Respondent time to complete.** Approximately 5 minutes, possibly faster depending on the population and burden of exposures.

**Administrative burden.** Low burden outside of health care setting. If administered to parents/caregivers of a child within a health care setting, the burden may increase if exposures trigger services.

**Translations.** The ACE Questionnaire has been translated into multiple languages, including Spanish, German, French, Norwegian, and Swedish.

**Adaptations.** There is a validated short form ACE screener that shows strong convergent validity with the full ACE measure and was similarly related to the health outcomes. The short form ACE screener is made up of two items assessing exposure to
household alcohol abuse and emotional abuse. Several other versions of the ACE Questionnaire exist, including the ACE-IQ, the ACE from the Center for Youth Wellness, the Philadelphia ACEs, the National Survey of Child and Adolescent Well-being, the National Survey of Children's Health-ACEs, and the Behavioral Risk Factor Surveillance System-ACEs. They range in content but generally incorporate the standard Centers for Disease Control and Prevention/Kaiser ACEs questions, use similar methodology, and demonstrate consistent associations with worse health outcomes (23).

Psychometric information

Floor and ceiling effects. Floor and ceiling effects have not been explicitly investigated; however, because ACEs occur more frequently in certain populations, including low SES populations, such effects are possible.

Reliability. Several studies report a modest to good test-retest reliability period (24,25). Similarly, the internal consistency of the ACE items is generally moderate to high (26).

Validity. The ACE measure shows good construct validity because it shows strong correlations with other childhood trauma measures (27).

Responsiveness. This is a measure of childhood exposures and is not appropriate for responsiveness psychometrics.

Minimally important differences. This is a measure of exposure not response.

Generalizability. This measure appears to be generalizable, although cultural considerations are warranted when using this measure to predict future health outcomes. Similarly, there may be sensitive periods in development when exposures are more meaningful that are not traditionally captured in the standard ACE measure, possibility limiting its generalizability.

Use in clinical trials. Several clinical trials have been conducted in which participants report ACEs, or in which the ACEs score is hypothesized as a moderator. However, ACEs have not been tested as a primary outcome in a clinical trial setting.

TRAUMA HISTORY QUESTIONNAIRE

Description

Purpose. To measure lifetime exposure to stressful and potentially traumatic events in general, community, and clinical populations.

Content or domains. The THQ covers a broad range of stressors and potentially traumatic events that meet Criterion A of the Diagnostic and Statistical Manual of Mental Disorders (DSM). Criterion A includes situations in which a person experienced, witnessed, or was confronted with an event involving a threat to the physical integrity of the self or others. Criterion A does not include symptoms or responses related to the event (31). THQ items ask respondents about 24 different and prevalent types of stressful and traumatic experiences, including crime, general disaster, and physical and sexual assault (32).

Number of items. The THQ is a 24-item self-report measure.

Response options/scale. Respondents are asked whether each event ever happened to them (yes/no). For each event endorsed, respondents are asked to provide qualitative details about the event, the frequency of the event, and their approximate age at the time of the event.

Recall period for items. Entire lifetime.

Cost to use. The THQ is free to use. Permission for use is not necessary when use is for nonprofit academic research or nonprofit educational purposes.
How to obtain. All language versions are available for download at the following URL: https://ctc.georgetown.edu/toolkit/.

Practical application

Method of administration. The THQ can be easily administered as a self-report instrument or in an interview format. It can be administered in person, by written or interview format, by telephone interview, by mail, or electronically.

Scoring. The THQ is a data collection instrument not a test, so there is no standard scoring method. However, the most common scoring convention is to generate a total score representing the numbers and types of events endorsed by summing all items (33,34), which can range from 0 to 24. A researcher or clinician can also generate subscale scores, calculated by summing items associated with crime-related events (four items; range: 0-4), general disaster and traumatic events (13 items; range: 0-13), and physical and sexual experiences (six items; range: 0-6). The final item allows for reports of traumatic experiences not covered in the other statements and is not usually scored unless the provided response contains relevant information not pertaining to the other items. Other researchers have dichotomized the total trauma score to classify participants as low or high trauma (35,36). For example, Spertus et al grouped participants who reported no traumatic events or only one kind of event as low trauma and participants who reported two or more kinds of traumatic events as high trauma (35).

Score interpretation. Higher scores on the total trauma score and subscale scores indicate greater exposure to stressful and traumatic events (32). Consistent with other trauma history instruments, there is no standard scoring system; thus, no normative data have been published.

Respondent time to complete. The self-report paper-and-pencil format takes approximately 10 to 15 minutes to complete. Administering it as an interview takes approximately 15 to 20 minutes depending on the number and types of trauma-exposed events the person endorses.

Administrative burden. Training to administer. Minimal. Equipment needed. When self-administered, a pencil, pen, or electronic report form are needed.

Time to score. Minimal training time to score; approximately 5 to 10 minutes.

Translations/adaptations. The THQ has been culturally adapted and translated into Portuguese (37), Spanish (38), Hebrew (39), Kurdish (40), French, Danish, Urdu, Icelandic, Japanese, and Vietnamese. Many of these translated versions are available for download (see How to obtain).

Psychometric information

Floor and ceiling effects. Researchers have not evaluated floor or ceiling effects for the total trauma or subscale scores of the THQ.

Reliability. Test-retest reliability. In the original study testing the psychometric properties of the THQ (41), stability coefficients over 2 to 3 months ranged from 0.47 to 0.91 for the reporting of specific traumatic events (yes/no). The correlation for the number of items endorsed across administrations was $r = 0.70$, indicating adequate reliability. In a study administering the THQ as an interview with a small sample of psychiatric outpatients, researchers found $\kappa$ coefficients ranging from 0.57 to 0.69 across 7 days for events endorsed by at least 20% of the sample (42).

Interrater reliability. Mueser et al also found excellent consistency among three interviewers rating audiotaped interviews, with $\kappa$ coefficients ranging from 0.76 to 1.00 for events endorsed by at least 20% of participants (42).

Validity. Face and content validity were established in the development of the THQ by including items that correspond with DSM examples of Criterion A stressors.

Construct validity. In a small sample, items on the THQ were compared with those on the Stressful Life Events Screening Questionnaire. The authors found high variability in $\kappa$ coefficients (ranging from 0.13-1.00), indicating adequate convergent validity for several items (43). Scores on the THQ were also significantly positively correlated with scores on the Conflict Tactics Scale ($r = 0.46$), which measures intrafamily conflict and violence (44).

Criterion-related validity. THQ scores for the total number of traumas and the type of trauma have been significant predictors of rates of PTSD and PTSD symptomatology (45). THQ scores have also been significantly positively related to depression and personality disorders and inversely related to resilience and mental health functioning (46).

Responsiveness and minimally important differences. This instrument is a checklist of stressful and traumatic event exposure and not a measure of symptom severity following exposure, which would change over time. Thus, there have been no studies that sought to determine the responsiveness or minimally important differences of the THQ.

Generalizability. The THQ has been used in samples of college students, people with severe mental illness, pregnant women, individuals with substance dependence, police officers, people with epilepsy, and people with lower income, among many others. It has been used by researchers in the United States and internationally to assess trauma and stressor exposure. Thus, results derived from use of the THQ are generalizable to several...
demographic groups and cultures. It may not be generalizable to specific clinical groups for which it has not yet been validated.

**Use in clinical trials.** The THQ, similar to other stressful life event inventories, is not intended to measure change over time in the context of a randomized controlled trial. Thus, it has mostly been administered at baseline in clinical trials to classify the proportion of the sample that has experienced certain trauma or meets the criteria for PTSD (47).

**Critical appraisal of overall value to the rheumatology community**

**Strengths.** The THQ is easy to administer and requires minimal time from respondents. Across a range of both national and international studies, the THQ appears to be a reliable and valid questionnaire for assessing trauma and stress exposure in clinical and nonclinical samples.

**Caveats and cautions.** Findings about the psychometric properties of this measure are preliminary; most of the studies assessing reliability and validity were in small samples that may not be generalizable (e.g., primarily white patients with severe mental illness). Further, the test-retest reliability ranges from fair to excellent across different types of events, with higher reliability for the total number of events endorsed compared with individual items.

**Clinical usability.** This instrument is potentially useful to mental health providers to screen for prior trauma exposure that could impact mental and/or physical health. However, it is not endorsed as a tool to diagnose or treat clinical conditions such as PTSD and has low direct clinical usability to practicing rheumatologists.

**Research usability.** The THQ is useful for research studies that aim to assess lifetime exposure to events that are considered stressful and potentially traumatic in relationship to physiological stress reactivity, health behaviors, and clinical outcomes such as onset of autoimmune conditions and/or autoimmune disease severity.

**LIFE EVENTS LIST**

**Description**

**Purpose.** To assess the occurrence of major life events in the past 12 months.

**Content or domains.** The measure is composed of major life events, both positive and negative, experienced by the person completing the questionnaire (i.e., self) and/or someone with whom they are close. These events include a broad spectrum of experiences, including relocation, interpersonal loss (e.g., romantic breakup), job loss or gain, marriage, new baby, death of a loved one, and significant change in finances.

**Number of items.** The LEL contains 26 event items (23 specified events and three optional events). For items that are endorsed as occurring, there are follow-up questions to determine whether the event was perceived as positive or negative, who experienced the event (self vs close other), and additional contextual information.

**Response options/scale.** Event occurrence is assessed as yes/no. Follow-up question response scales are specific to the particular event.

**Recall period for items.** Past 12 months.

**Cost to use.** The LEL is free to use. Permission for use is not necessary when use is for nonprofit academic research or nonprofit educational purposes.

**How to obtain.** The LEL is available on the author's university website at the following URL: https://www.cmu.edu/dietrich/psychology/stress-immunity-disease-lab/scales/index.html.

**Practical application**

**Method of administration.** Can be administered by interview, paper and pencil, or computer.

**Scoring.** Items are scored based on whether they occurred, the perceived impact of the event (positive vs negative), and whether the event occurred to the respondent or a close other. Specific scoring for each item is available at the following URL: https://www.cmu.edu/dietrich/psychology/stress-immunity-disease-lab/scales/pdf/lel_scoring_revised.pdf.

**Score interpretation.** Higher scores indicate more exposure to life events in the past 12 months (range: 0-61). Subscales also include total negative self-events, total positive self-events, total negative other events, total positive other events, total negative events, and total positive events.

**Respondent time to complete.** The time to complete will vary based on number of items endorsed, with a mean range of 5 to 10 minutes.

**Administrative burden.** Training to administer: Minimal. Equipment needed: When self-administered, a pencil, pen, or electronic report form are needed.
Time to score. Minimal training time to score; approximately 5 to 10 minutes.

Translations/adaptations. The LEL is in English only but can be translated. However, when generating translated versions, care should be taken to include culturally relevant events.

Psychometric information

Floor and ceiling effects. Researchers have not evaluated floor or ceiling effects for total life events or subscales of events (eg, positive vs negative and self vs close other).

Reliability. This is a checklist of major life events. As such, it does not make sense to assess internal consistency because endorsement of one event is unlikely to increase the chances of endorsing another event. Test-retest reliability of this measure has not been reported.

Validity. The events were a subset of those appearing in the List of Recent Experiences (48) and were chosen for their potential impact and their relatively high frequency of occurrence in population studies (49).

Responsiveness and minimally important differences. This instrument is a checklist of exposure to major life events and not a measure of severity following exposure, which would change over time. Studies of responsiveness have not been conducted.

Generalizability. This scale has largely been used in healthy community samples. The events included in this measure likely reflect events that happen more commonly among adults, especially among those from Western cultures. It is not intended for use in children.

Use in clinical trials. This scale has not been used in clinical trials.

Critical appraisal of overall value to the rheumatology community

Strengths. The LEL can be easily administered quickly and at low cost. It provides an assessment of both positive and negative life events that may affect the progression of rheumatic disease. This measure also goes beyond self-relevant events to obtain information on events that affect close others.

Caveats and cautions. This measure has not been rigorously evaluated with psychometric testing. This is particularly relevant when it comes to the stability of subjective rating of an event (eg, how one feels about a romantic breakup is likely to change over time). Moreover, some events may be more relevant to some populations than others. For example, job loss is not appropriate for a largely retired population.

Clinical and research usability. This measure may be useful in understanding triggers of disease; however, it has not been used in clinical or research contexts in those with rheumatologic conditions to date. Higher scores have been predictive of greater susceptibility to infectious illness in a healthy population using experimental paradigms (48), which may be relevant to patients with rheumatic conditions who are taking immunosuppressing medications because those treatments also confer an elevated risk of infection.

AUTHOR CONTRIBUTIONS

All authors drafted the article, revised it critically for important intellectual content, and approved the final version to be published.

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Table 1. Practical applications*  
| Measure       | Number of Items | Content and Domains                                                                 | Method of Administration | Recall Period | Response Format     | Range of Scores | Score Interpretation                                                                 | Availability of Normative Data                                                                 | Cross-cultural Validation                                                                 |
|---------------|-----------------|-------------------------------------------------------------------------------------|--------------------------|---------------|---------------------|----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| PSS           | 14 (there are also 10-item and 4-item scales) | Global perceived stress                                                             | Written or interview format | 4 wk          | Five-point scale    | 0-56 (14-item scale); 0-40 (10-item scale); 0-16 (4-item scale) | Higher scores indicate greater perceived stress.                                          | Available from large samples of US residents                                                                 | Many non-English translations have been validated in other cultures by independent research groups. |
| ACE Questionnaire | 10              | Trauma exposure                                                                     | Written or interview     | First 18 mo of life | Occurrence (yes/no) | 0-10          | Higher scores indicate more trauma exposure                                          | Available from population samples                                                                 |                                                                                           |
| THQ           | 24              | Lifetime exposure to traumatic events (crime-related, general disaster, and physical and sexual experiences) | Written or interview | Lifetime | Occurrence (yes/no), frequency, and approximate age | 0-24 (total score); 0-4 (crime-related events); 0-13 (general disaster and traumatic events); and 0-6 (physical and sexual experiences) | Higher scores indicate greater stressor and trauma exposure.                              | No normative data                                                                                      | Culturally adapted and translated into Portuguese, Spanish, Hebrew, Kurdish, French, Danish, Urdu, Icelandic, Japanese, and Vietnamese |
| LEL           | 23 specific events and 3 optional events | Exposure to positive and negative life events                                       | Written or interview     | Past 12 mo     | Occurrence (yes/no); follow-up questions specify contextual information (self vs. other; positive vs. negative) | 0-61 (total score) | Higher scores indicate more exposures in past year.                                  | No normative data                                                                                      | No known cross-sectional validation                                                        |

* ACE = Adverse Childhood Event; LEL = Life Events List; PSS = Perceived Stress Scale; THQ = Trauma History Questionnaire.
Table 2. Psychometrics*

| Measure         | Floor and Ceiling Effects | Reliability | Validity | Responsiveness | Minimally Important Differences | Generalizability                                                                 | Used in RCTs |
|-----------------|---------------------------|-------------|----------|----------------|----------------------------------|----------------------------------------------------------------------------------|--------------|
| PSS             | Negligible                | Good for PSS-14 and PSS-10; marginally acceptable for PSS-4 | Good      | Adequate       | PSS-10: 11 points for absolute change score | Adults with education through high school or beyond                               | Yes          |
| ACE Questionnaire| Unknown                   | Moderate to good | Good     | NA             | NA                               | Likely generalizable across populations; the ACE-International Questionnaire has also been created to be used in low- and middle-income countries. | At baseline to classify sample trauma exposure |
| THQ             | NA                        | Good        | Good     | NA             | NA                               | Several demographic and clinical groups and cultures                            | At baseline to classify sample trauma exposure |
| LEL             | NA                        | Unknown     | Good     | NA             | NA                               | Adult community samples                                                           | No           |

*ACE = Adverse Childhood Experience; LEL = Life Events List; NA = not applicable; PSS = Perceived Stress Scale; RCT = randomized controlled trial; THQ = Trauma History Questionnaire.