Published in final edited form as:

J Psychiatr Pract. 2015 November ; 21(6): 474–483. doi:10.1097/PRA.0000000000000107.

The Symptoms of Trauma Scale (SOTS): An Initial Psychometric Study

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Abstract

The Symptoms of Trauma Scale (SOTS) is a 12-item, interview-based, clinician rating measure that assesses the severity of a range of trauma-related symptoms. This pilot study evaluated its use and psychometric properties in an outpatient setting that provides treatment to survivors of chronic interpersonal trauma. Thirty participants completed self-report measures of posttraumatic stress

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The authors declare no conflicts of interest.

symptoms, depression, dissociation, self-esteem, and affect dysregulation; the participants also participated separately in a semi-structured interview based on the SOTS conducted by two trained interviewers. SOTS composite severity scores for *DSM-IV* PTSD and complex PTSD (cPTSD), *DSM-5* PTSD, and PTSD dissociative sub-type, and total traumatic stress symptoms generally had acceptable internal consistency and inter-rater reliability. Evidence of convergent, discriminant, criterion, and construct validity was found for the SOTS composite PTSD scores, although potential limitations to validity that require further research and refinement of the measure were identified for the SOTS total and *DSM-IV* cPTSD scores and the hyperarousal, affect dysregulation, and dissociation items. Interviewers and interviewees described the interview as efficient, informative, and well tolerated. Implications for clinical practice and research to refine the SOTS are discussed.

Keywords

Symptoms of Trauma Scale (SOTS); assessment; screening; clinician-rated; posttraumatic stress disorder; psychometrics; validity; reliability

Advances in the treatment and science of posttraumatic stress disorder (PTSD)¹ require outcome measures that are user friendly, time efficient, comprehensive in covering a range of trauma-related symptoms, sensitive to change, and suitable for both clinical and research use.² In addition to self-report interview and questionnaire measures, clinician rated measures offer a valuable collateral perspective and are widely used to assess progress and outcome clinically and in mental health treatment research (eg, Clinical Global Impressions [CGI] scale,³ Positive and Negative Syndrome Scale [PANSS]^{4,5}). Clinician ratings and clients' self-reports of change while in psychotherapy for PTSD have been found to be highly interrelated, although clinician ratings appear to be a more conservative assessment (ie, yielding lesser absolute levels of change).⁶

Although several validated PTSD diagnostic interviews and self-report questionnaires are available to clinicians and researchers,² only one psychometrically validated clinician rating instrument for PTSD symptoms has been reported: the Stress Response Rating Scale (SRRS).⁷ The SRRS addresses intrusive re-experiencing and avoidance/numbing symptoms but it does not rate PTSD hyperarousal symptoms. The SRRS also does not assess complex PTSD (cPTSD) symptoms of affect or somatic dysregulation, dissociation, and altered fundamental schemas of self, relationships, and meaning,^{8–10} that are included in the *DSM-5* reformulation of PTSD.^{11,12} Affect dysregulation and altered schemas of the self and relationships have also been proposed as the core features of cPTSD in the forthcoming World Health Organization International Classification of Diseases, 11th Edition (*ICD-11*).^{13,14} Thus, in order to be consistent with the *DSM-5* and the forthcoming *ICD-11*, a comprehensive clinician-rated measure of traumatic stress symptoms must cover the full array of symptom domains of classic PTSD (ie, intrusion, avoidance, emotional numbing, hyperarousal) and also cPTSD (ie, affect dysregulation, somatization, dissociation, altered self-schemas, altered relational schemas [including sexual relationships], and altered beliefs about the world and spirituality).

The Clinician Administered PTSD Scale (CAPS)¹⁵ is a semi-structured interview that is the most widely used and best validated clinician rating diagnostic measure for adult PTSD. For adult cPTSD, only one semi-structured interview for clinician ratings has been validated, the Structured Interview for Disorders of Extreme Stress (SIDES).¹⁶ The CAPS and SIDES are long (more than 35 items require rating) and generally take an hour or more to administer. The CAPS includes only a few cPTSD symptoms as associated features of PTSD (eg, affect dysregulation, dissociative symptoms). The SIDES does not assess *DSM-IV* or *DSM-5* PTSD symptoms nor does it assess the frequency vs. intensity of symptoms. Thus, a briefer semi-structured, interview-based, clinician-rated measure of *DSM-IV*, *DSM-5*, and cPTSD symptoms' frequency and intensity may have unique clinical utility.

Briefer but comprehensive measures that are better suited for efficiently assessing change in patients being treated for PTSD are needed. Brief (4–17 items) self-report screening questionnaires have been shown to be moderately accurate in identifying individuals with PTSD.^{17–20} However, these measures rely exclusively on self-report. They also include only *DSM-IV* PTSD symptoms or criterion domains, and do not address the expanded symptom set in cPTSD and *DSM-5* PTSD.

The Symptoms of Trauma Scale (SOTS) was designed to fill this gap. The SOTS is modeled on the PANSS format, with a semi-structured interview and behaviorally specific 7-point clinician rating scales assessing each symptom's severity. The 12 SOTS symptoms represent 4 factor analytically derived domains of *DSM-IV* PTSD identified in the emotional numbing²¹ structural model, and 8 domains of cPTSD.²² Like the PANSS,²³ the SOTS is not a diagnostic measure: it is a symptom-severity rating scale designed to be (1) sensitive to change; and (2) used as a screener for PTSD symptoms or in conjunction with PTSD diagnostic instruments. Also like the PANSS, the SOTS could be used in the evaluation of novel treatments, to help classify key endpoints, such as symptom remission, and to provide practicing clinicians with a systematic tool to monitor progress and outcomes. The study described here was a preliminary test of the psychometrics and clinical utility of the SOTS interview and rating scale in a clinical setting.

METHOD

Setting and Participants

The study was conducted in an outpatient PTSD treatment program located in the adult psychiatry department of a large public sector health care system, following a protocol approved by the Cambridge Health Alliance and Western Institutional Review Boards. A convenience sample ($N = 30$; 23 females, 7 males; age range 22 to 63 years, mean age = 41.1 yr, $SD = 10.9$ yr; 77% Caucasian, 7% African American, 7% Latino; 7% Native American; 3% mixed race) of consecutive admissions was recruited, with no refusals. Similar percentages of the participants were employed (45%) or not working or on disability (55%). Most participants (83%) had no primary marital/couple relationship due to being single (43%), divorced or separated (37%), or widowed (3%). Consistent with the focus of the treatment program, lifetime exposure to potentially traumatic adversity was extensive (mean = 7.4 of 15 possible types; $SD = 2.85$; range = 2 to 11 types), often beginning in childhood (47%) and typically continuing for years (67%) rather than a single or time-

limited incident. The most frequently reported trauma types were childhood physical abuse (77%), childhood sexual abuse (63%), and physical assault as an adult by a known perpetrator (63%). Most of the men ($n = 6$; 86%) reported definite or probable childhood sexual and physical abuse, beginning before 6 years of age. A comparable proportion of women ($n = 19$; 83%) reported childhood sexual or physical abuse; however, fewer than half of these women ($n = 9$, 47%) reported that the abuse had an onset before 6 years of age.

Measures

Demographics and Health—Age, gender, current employment, and marital status were ascertained by self-report. Participants were asked to rate their current physical health on a scale ranging from 1 = excellent to 5 = poor, and to indicate whether they were currently under a medical doctor's care.

Symptoms of Trauma Scale (SOTS)—The SOTS²⁴ has two components: (1) a semi-structured interview, the Structured Clinical Interview for the Symptoms of Trauma Scale (SCI-SOTS), used to obtain information about the presence or absence of symptoms during a defined time period (in this study, the past week), which takes less than 30 minutes to administer; and (2) 12 symptom items (Table 1) which are each rated on a 7-point severity scale similar to the CGI severity scale (i.e., absent, minimal, mild, moderate, moderate/severe, severe, extreme). Detailed criteria anchoring each severity level are provided, paralleling the CAPS frequency and intensity ratings but combining the dimensions in a single rating for efficiency. For example, a “moderate” level symptom must be either frequent (at least twice a week) without significant distress or impairment, or infrequent with significant distress or impairment. SOTS total scores range from 12 to 84.²⁴ Scores were also computed for SOTS *DSM-IV* PTSD items (#1, 2, 5, 6; intrusive re-experiencing, hyperarousal, avoidance, emotional numbing; range 4 to 28), cPTSD items (#3, 4, 7–12; affect dysregulation, impulsivity, dissociation, altered self-perceptions, interpersonal relations, sexual relations/behavior, and sustaining beliefs (beliefs about the world and spirituality), and somatic dysregulation; range 8–56), items corresponding to the *DSM-5* criteria for PTSD (#1–6, 8, 11; intrusive re-experiencing, hyperarousal, impulsivity, affect dysregulation, avoidance, emotional numbing, altered self-perceptions and sustaining beliefs; range 8–56) and the PTSD Dissociative Sub-type (#1–8, 11; intrusive re-experiencing, hyperarousal, impulsivity, affect dysregulation, emotional numbing, avoidance, dissociation, altered self-perceptions and sustaining beliefs; range 9–63), and the *ICD-11* cPTSD items (#1–3, 5, 8, 9; intrusive re-experiencing, hyperarousal, affect dysregulation, avoidance, altered self-perceptions and relationships; range 6–42).

Posttraumatic Stress Diagnostic Scale (PDS).²⁵—This self-report measure assesses the frequency of the 17 *DSM-IV* PTSD symptoms on a scale of 0 to 3. A total score and scores for Criteria B (Re-experiencing), C (Avoidance/Emotional Numbing), and D (Hyperarousal) are computed. The PDS has shown good sensitivity and specificity for structured interview PTSD diagnoses, internal consistency and retest reliability, and concurrent and convergent validity.²⁵

Beck Depression Inventory (BDI).²⁶—This 21-item self-report measure assesses current severity of depression. Each item presents a hierarchy of indicators of severity for a symptom corresponding to scores from 0 to 3. The BDI total score has been shown to have internal consistency and temporal stability, as well as good concurrent and construct validity.²⁷

Dissociative Experiences Scale (DES).²⁸—This 28-item self-report questionnaire was developed to assess dissociation in normal and clinical populations. Respondents indicate the percentage of the time they experience dissociative phenomena on a scale of 0% to 100% of the time, with a total score calculated as the mean of all item scores. A meta-analytic study confirmed the DES's internal consistency, test-retest reliability, and convergent and predictive validity.²⁹

Rosenberg Self-Esteem Survey (RSES).³⁰—This widely used measure of self-esteem has 10 positively-scored items answered on a 4-point scale. The RSES has been shown to have internal consistency and test-retest reliability, as well as convergent and discriminant validity.³¹

Difficulties with Emotion Regulation Scale (DERS).³²—This 36-item self-report questionnaire assesses difficulties understanding, accepting, modulating, and enacting goal-directed actions when emotionally distressed, using a 5-point Likert-type scale ranging from 1=*almost never* to 5=*almost always*. The DERS total score has been shown to have internal consistency, test-retest reliability, and convergent validity with emotion regulation, experiential avoidance, emotional inexpressivity, self-harm behavior, and intimate partner abuse scores.³³

Procedure

Three research clinicians at the clinic site were trained by the SOTS developers in the use of the interview and rating scale. As part of the standard intake process, all patients provided demographic and health information and completed the PDS, BDI, DES, RSES, and DERS. They were invited to participate in a research interview within 2 weeks, for which they were compensated. Two raters were present for each interview, one of whom conducted the interview. Immediately following the interview, each rater independently scored the SOTS rating scale. In order to ensure that SOTS ratings were independent of all other data, interviewers had no access to any other information about participants, including their self-report questionnaire results.

RESULTS

SOTS summary scores were unrelated to age ($r = -0.02$ to 0.07 , $p > 0.70$) and ethnicity (ethnoracial minority vs. white, non-hispanic: $t(28) = 1.05$ – 1.65 , $p = 0.11$ to 0.30). Men scored 10% to 20% higher than women on all SOTS summary variables, but this difference was statistically significant only for the *DSM-5* PTSD summary score: $t(28) = 2.12$, $p = 0.04$. Correspondingly, on the self-report measures, men also had 50% higher levels of PTSD and depression symptoms than the participating women: $t(29) = 2.66$ – 3.42 , $p = 0.002$ to 0.01 . In addition, unemployed or disabled individuals had significantly (15% to 30%)

higher scores than participants who were working full or part-time on all SOTS summary variables: $t(28) = 2.25\text{--}3.57$, $p = 0.001$ to 0.03 .

Reliability of the SOTS Scale Items and Summary Scores

Intraclass coefficients (ICCs) were used to assess interrater agreement and agreement between SOTS and self-report measure scores, using the following convention for interpreting results: ICC < 0.40 poor; 0.40 to 0.75 moderate; and > 0.75 excellent.³⁴ Cronbach's alpha was used to assess the internal consistency of the SOTS summary scores.

Excellent interrater agreement was obtained for the SOTS total and summary scores (ICC = 0.88 to 0.95; see Table 1). For individual items, interrater reliability was also in the excellent range, from ICC = 0.81 (Impulsivity) to 0.92 (Re-experiencing), except for the Hyperarousal item, which showed moderate interrater agreement (ICC = 0.62).

Using a composite score (the average of the two raters' scores), internal consistency for the total SOTS was acceptable (alpha = 0.73). All items contributed to the scale's internal consistency: removal of any item decreased the alpha or left it essentially unchanged (at most increasing alpha by 0.01 to 0.74). Further evidence of internal consistency reliability was provided by positive item-total score correlations which ranged from $r = 0.13$ for altered sexual relations and $r = 0.23$ for somatic dysregulation to $r = 0.57$ for hyperarousal and 0.61 for dissociation.

Internal consistency of the SOTS *DSM-IV* PTSD score was low, alpha = 0.37. If the emotional numbing item was removed, the alpha rose to a marginal level (0.54). Internal consistency for the SOTS *DSM-IV* cPTSD score was also marginal (alpha = 0.64). However, all items contributed to the scale's internal consistency: removal of any item left the alpha essentially unchanged (at most increasing the alpha by 0.03 to 0.67). Internal consistency for scores on the SOTS *DSM-5* PTSD (alpha = 0.70), PTSD dissociative sub-type (alpha = 0.74), and the *ICD-11* cPTSD (alpha = 0.71) scales was good, with all items contributing to the internal consistency of scores on these scales.

Validity of the SOTS Summary Scores

SOTS Total Score—There was strong evidence of convergent validity between the SOTS total score and independently self-reported PTSD symptom severity on the PDS and its criteria B, C, and D sub-scales (see Table 2). Additional evidence for convergent validity was provided by significant correlations with measures assessing symptoms of conditions that are often comorbid with PTSD, including depression (BDI), emotion dysregulation (DERS), low self-esteem (RSES), and poor physical health (Table 2). Preliminary evidence of discriminant validity was provided by the finding that the SOTS total score was more highly correlated with the PDS total score than with physical health or being in medical care, although the differences were not statistically significantly ($z < 1.5$, $P > 0.15$).

However, the correlation between the SOTS and DES total scores, while in the expected direction, was not statistically significant (Table 2). Examination of bivariate correlations between each SOTS item and the DES total score showed that the strongest association was with the SOTS dissociation item ($r = 0.34$), but other SOTS items had comparable

correlations (ie, $r = 0.21$ to 0.33) with the DES, including traditional PTSD features (ie, hyperarousal, intrusive re-experiencing, avoidance) as well as cPTSD features (ie, altered self-perceptions and sustaining beliefs). Thus, although the SOTS dissociation item was the SOTS item most closely related to self-reported dissociation, the relationship was neither strong (ie, not statistically significant, $P=0.08$; and only approximately 10% shared variance) nor clearly specific (ie, other SOTS PTSD and cPTSD items had comparable associations with self-reported dissociation).

SOTS DSM-IV PTSD Score—The SOTS *DSM-IV* PTSD score produced correlations with all convergent measures that were comparable to those of the SOTS total score (Table 2). The correlation of the SOTS *DSM-IV* PTSD score with self-reported PTSD was also significantly higher³⁵ ($z = 2.48$, $P=0.01$) than its correlation with current medical care, and higher (although not statistically significantly, $z = 1.74$, $P=0.08$) than its correlation with general physical health, providing support for the discriminant validity of the SOTS *DSM-IV* PTSD score.

SOTS DSM-IV cPTSD Score—Although the *DSM-IV* cPTSD score was correlated with self-reported depression, low self-esteem, affect dysregulation, and dissociation, the evidence for convergent validity was mixed because these correlations were at most comparable to, and in some cases lower than, the correlations between the SOTS *DSM-IV* PTSD score and the self-report scores. Similarly, the correlations of the SOTS *DSM-IV* cPTSD score with self-reported physical health and medical care (Table 2) were higher than those for the SOTS *DSM-IV* score (supporting discriminant validity), but the difference in magnitude of the correlations for the SOTS cPTSD vs. PTSD scores was not statistically significant ($z = 1.1$, $P>0.25$). Thus, there was mixed support for the SOTS *DSM-IV* cPTSD score's convergent and discriminant validity.

SOTS DSM-5 PTSD Scores—The SOTS *DSM-5* PTSD and PTSD-Dissociative Sub-type scores were correlated with self-reported PTSD and depression symptoms, affect dysregulation, and low self-esteem, supporting their convergent validity. The SOTS *DSM-5* PTSD scores' correlations with self-reported dissociation were comparable to those for all other SOTS scores, failing to support criterion validity for the SOTS *DSM-5* PTSD Dissociative Subtype score. However, support for the SOTS *DSM-5* PTSD Dissociative Subtype score's convergent validity was provided by its significant correlation with poor physical health. Both of the SOTS *DSM-5* PTSD scores correlated significantly more strongly with self-reported PTSD than with self-reported medical care, and also (although only for the PTSD score but not the Dissociative Subtype score) with physical health ($z=1.96-2.43$, $P=0.015$), consistent with criterion validity. Thus, the SOTS *DSM-5* PTSD score showed consistent evidence of validity, while the validity evidence for the SOTS *DSM-5* PTSD Dissociative Sub-type score was mixed.

SOTS ICD-11 cPTSD Score—The SOTS *ICD-11* cPTSD score was correlated with all convergent measures except dissociation (Table 2), with significantly higher correlations with self-reported PTSD and low self-esteem than its correlations with current medical care and general physical health ($z=2.03$ to 3.04 , $P<0.05$). Thus, the *ICD-11* PTSD summary

score had the most consistent evidence of convergent and discriminant validity of any SOTS summary score.

Construct Validity of SOTS PTSD Scores

If the SOTS scores have construct validity for the assessment of PTSD as distinct from comorbid psychiatric symptoms (eg, depression) and altered self-schemas (eg, self-esteem), partial correlations between the SOTS composite scores and self-reported PTSD scores should be statistically significant after controlling for self-reported depression severity and self-esteem. This was the case for the SOTS *DSM-IV* and *DSM-5* PTSD and *ICD-11* cPTSD scores, which had significant partial correlations with self-reported total PTSD and intrusive re-experiencing and avoidance/emotional numbing symptoms ($r_p = 0.40$ to 0.60 , $P < 0.05$), and with self-reported total PTSD and intrusive-re-experiencing symptoms after accounting for the effects of self-reported self-esteem ($r_p = 0.40$ to 0.57 , $P < 0.05$). However, partial correlations for the SOTS total and *DSM-IV* cPTSD scores were not significant ($r_p = 0.08$ to 0.36 , $P > 0.05$), except for the correlation between the total SOTS score and self-reported PTSD ($r_p = 0.39$, $P < 0.05$). Thus, construct validity was preliminarily supported for the SOTS *DSM-IV* PTSD, *DSM-5* PTSD, and *ICD-11* cPTSD scores, but not for the SOTS total and *DSM-IV* cPTSD scores.

Unexpectedly, there was an absence of evidence for an association between any SOTS score and self-reported PTSD hyperarousal after controlling for depression or self-esteem ($r_p = 0.21$ to 0.36 , $P > 0.05$)—with the single exception of the *DSM-IV* PTSD score ($r = 0.38$, $P < 0.05$). The SOTS item for hyperarousal was also not correlated with self-reported hyperarousal ($r = 0.13$ to 0.23 , $P > 0.20$). Only two individual SOTS items were correlated with self-reported hyperarousal, intrusive re-experiencing, and altered sexual relations/behavior ($r = 0.39$ to 0.44 , $P < 0.05$). The SOTS composite scores and individual items thus may not validly assess self-reported PTSD hyperarousal.

Clinical Utility of the SOTS

SOTS interviews and ratings were typically completed in less than 30 minutes (range = 20 to 40 minutes). Qualitative feedback from interviewers indicated that the interview was easy to administer and score. Participants consistently provided positive feedback, with no complaints of more than mild distress or reports that the questions were intrusive or difficult to understand. Participants reported that the questions addressed important concerns that they felt should be considered in treatment planning and in tracking progress.

DISCUSSION

The findings of this pilot study provided preliminary evidence of the reliability, validity, and clinical utility of the SOTS as a clinician-rated measure of *DSM-IV* and *DSM-5* PTSD and *ICD-11* cPTSD symptom levels in a psychiatric outpatient sample. Inter-rater reliability was good for all SOTS items except the Hyperarousal item, and internal consistency was acceptable except for the *DSM-IV* summary score. Convergent validity was supported by consistent correlations in expected directions for the SOTS PTSD and cPTSD summary scores with independently self-reported *DSM-IV* PTSD symptoms and depression

symptoms, as well as self-reported affect dysregulation and low self-esteem consistent with *DSM-5* PTSD³⁶ and *ICD-11* cPTSD. The specificity of the SOTS summary scores as distinct from depression and low self-esteem was demonstrated for the *DSM-IV* and *DSM-5* PTSD and *ICD-11* cPTSD composite scores. These findings suggest that the SOTS may be useful in screening for *DSM-IV*³⁷ and *DSM-5*³⁸ PTSD symptoms and *ICD-11* cPTSD symptoms.

However, the findings of this study also point to potential limitations in the SOTS that warrant further investigation with larger and more heterogeneous psychiatric samples and a wider range of types of validity constructs and measurement modalities (eg, structured interview, *in vivo* behavior observations, neurobiological indicators). First, the SOTS scores had relatively weak correspondence with self-report for PTSD hyperarousal symptoms, as compared to their robust associations with self-reported intrusive re-experiencing and avoidance/emotional numbing symptoms. This was particularly evident after accounting for the effects of depression and low self-esteem. The single SOTS hyperarousal item did not correlate with self-reported hyperarousal symptoms when depression and self-esteem were controlled for, and it reduced the internal consistency of the *DSM-IV* PTSD SOTS score. This was not entirely unexpected because hyperarousal symptoms have not been found to consistently fit statistically in structural models of PTSD,³⁷ and they may be more difficult for clients to disclose accurately or clinicians to rate accurately than other PTSD symptoms because they are not tied to specific traumatic experiences (unlike re-experiencing and avoidance symptoms) and they are found in a variety of internalizing and externalizing psychiatric disorders.⁶ Hyperarousal thus may be difficult for individuals with chronic and comorbid PTSD to recognize and report accurately due to becoming habituated to the physiologic tension and emotional irritability that accompanies many psychiatric disorders, or due to avoidance of awareness of distressing arousal states. Clinician ratings may therefore play an important role in identifying hyperarousal symptoms when patients under-report them.

On the other hand, refinement in the SOTS hyperarousal item may be needed to fully capture the intended clinical phenomenon. As stated, the SOTS hyperarousal item focuses on psychophysiological (ie, startle response) and attentional (ie, hypervigilance) aspects of hyperarousal. However, in the *DSM-IV*, hyperarousal also includes problems with sleep, anger, and concentration. In the *DSM-5*, the hyperarousal criterion is further expanded to include problems with aggression, reckless or dangerous behavior, and self-harm. The robust correlation between SOTS intrusive re-experiencing and altered sexual relations/behavior items and self-reported hyperarousal suggest that the SOTS operational definition of hyperarousal may need to be modified to specifically address feeling tense or on edge, as well as having startle reactions when in situations that elicit a sense of exposure to threats or discomforts that include unwanted intimacy as well as other forms of potential physical or interpersonal harm or danger.

A second finding that warrants clinical caution and further research was the weak evidence for the convergent and discriminant validity of the *DSM-IV* cPTSD summary score. Unlike the SOTS PTSD and *ICD-11* cPTSD summary scores, the *DSM-IV* cPTSD score was uncorrelated with all self-report PTSD variables after accounting for the effects of

depression and low self-esteem. The *DSM-IV* cPTSD associated features by definition are distinct from PTSD symptoms, with affect dysregulation and altered self-perception features that may conceptually overlap with depression and low-self-esteem. However, the SOTS cPTSD score was uncorrelated with self-reported affect dysregulation, and the SOTS intrusive re-experiencing, hyperarousal, and altered cognitions items were equally or more strongly correlated with self-reported affect dysregulation than the SOTS affect dysregulation item's correlation with self-reported affect dysregulation. Significant correlations between the *DSM-IV* and *DSM-5* PTSD and *ICD-11* cPTSD summary scores with self-reported affect dysregulation suggest that the SOTS summary scores do identify aspects of affect dysregulation. However, the SOTS affect dysregulation item warrants further empirical testing and possibly definitional revisions to adequately assess cPTSD.

A third substantive limitation of the SOTS that was identified through the findings of this study was weak evidence of convergent validity in relationship to self-reported dissociation. The especially low correlation between the SOTS cPTSD score and self-reported dissociation is consistent with evidence that dissociation may not be a core component of cPTSD.^{39,40} If dissociation is better conceptualized and clinically assessed as a sub-type of PTSD (ie, the *DSM-5* PTSD dissociative sub-type¹²), the SOTS *DSM-5* PTSD dissociative sub-type score should correlate particularly strongly with self-reported dissociation—but this was not found to be true in this study. One possible explanation suggested by the strong correlation between the SOTS dissociation item and self-reported physical health problems is that the SOTS dissociation item may better assess the somatoform than psychoform features⁴¹ of dissociation. The correlation of the SOTS total score and the *DSM-IV* cPTSD and *DSM-5* PTSD dissociative sub-type scores with self-reported poor physical health—and the absence of such a correlation for the SOTS summary scores that do not include the SOTS dissociation item (ie, *DSM-IV* and *DSM-5* PTSD and *ICD-11* cPTSD) provide evidence that the SOTS dissociation item may identify individuals whose health is not only compromised by the core PTSD symptoms⁴² but also by somatoform dissociation.⁴³ These individuals may be particularly likely to seek medical care, as suggested by the unique correlation of self-reported medical care with the SOTS *DSM-IV* cPTSD score.

The results of the study reported here should be considered preliminary due to several methodological limitations. Self-report measures were the sole validation criteria, and features of *DSM-5* PTSD and *ICD-11* cPTSD were assessed by proxy but not directly by the validation measures. The clinician interviewer/raters who made independent ratings with the SOTS were experienced in its use on a clinical basis; therefore, replication is needed with other clinicians who are naïve to the SOTS. Although the consecutive admission enrollment yielded a representative sample of the host clinic's clientele, the sample was small and restricted to adults in outpatient treatment for behavioral health problems related to exposure to violence. Most participants were polyvictims, having disclosed a history of exposure to multiple types of non-interpersonal (eg, accidents, illnesses, losses) and interpersonal (eg, abuse, violence) traumatic stressors. The small sample size attenuated the statistical power of the study analyses to detect relationships. Replication studies with larger samples are needed in facilities, clinics, and practice settings with varied types and levels of care (eg, primary care, intensive outpatient, and inpatient behavioral health) that serve patients with a

broader range of psychiatric disorders and trauma histories (eg, including no trauma and only single-incident or non-interpersonal traumas, as well as polyvictimization).

The representation of men in this study was limited, and participating men reported more extensive early life interpersonal trauma histories and more severe PTSD (both by self-report and on the SOTS *DSM-5* PTSD score) and depression symptoms and lower self-esteem than women participants. This finding is the opposite of the typical finding from past clinical and scientific studies in which women tend to report higher levels of PTSD symptoms.⁴⁴ However, severe levels of PTSD symptoms would be expected in treatment-seeking adults with histories of early childhood abuse. The gender difference on self-report measures of PTSD and depression in this sample corresponds to the gender difference in complex trauma histories, suggesting that the SOTS is validly identifying high levels of PTSD symptoms in this study's male participants.

Persons of color also comprised only approximately 25% of the sample, but they did not differ from white participants on any SOTS summary score or item score, nor on any self-report measure. Also, the pattern of reliability and validity findings was comparable for white and ethnoracial minority individuals. While requiring replication with larger samples of men and women of varied ethnicities, the SOTS appears to be applicable across gender and ethnicity.

Several features of the SOTS suggest that it would be useful for assessing change (eg, progress in treatment; trajectories of naturalistic posttraumatic adaptation over time): the ratings incorporating and integrating both self-report and clinical judgment; the relatively brief administration time (ie, approximately half to one-third the time required to administer a full structured interview for PTSD alone, such as the CAPS); the scope of symptoms covered (ie, cPTSD as well as PTSD symptoms); and the time frame of ratings (ie, past week for relatively current symptoms, as compared to PTSD diagnostic measures that refer to the past month). However, this study did not involve multiple administrations of the SOTS for each participant, and thus additional studies are needed to determine its sensitivity to change in treatment or in the natural course of posttraumatic adaptation.

In conclusion, the SOTS may meet a unique need for practicing clinicians and clinical researchers in psychiatric practices and facilities by providing a brief, reliable, and validated clinician-rated measure of PTSD and cPTSD symptom severity based on *ICD-11* cPTSD and *DSM-5* PTSD as well as *DSM-IV* criteria (including items for dissociation, affective and somatic dysregulation, impulsivity, and alterations in sexuality and schemas regarding self, relationships, and sustaining beliefs). While the initial findings from this study are promising, the results also point to potential limitations in key SOTS items (ie, hyperarousal, affect dysregulation, dissociation) that require further field testing and may potentially need to be revised if psychometric studies replicate those limitations. Based on the findings of this pilot study, psychiatric practitioners can consider the SOTS as a potential added source of data for treatment planning, progress monitoring, and effectiveness and efficacy outcome evaluations when working with adult psychiatric outpatients with extensive lifetime histories of exposure to traumatic stressors.

Acknowledgments

This study was supported in part by a grant from the National Institutes of Health (R41 MH075172-01A2) to the PANSS Institute.

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Table 1

Inter-rater Agreement for Symptoms of Traumatic Stress Scale Total and Item Scores

Variable	ICC
SOTS Total Score	0.88
SOTS <i>DSM-IV</i> PTSD Score	0.94
SOTS <i>DSM-IV</i> Complex PTSD (cPTSD) Score	0.93
SOTS <i>DSM-5</i> PTSD Score	0.94
SOTS <i>DSM-5</i> PTSD Dissociative Sub-Type Score	0.95
SOTS-1. Intrusive re-experiencing	0.92
SOTS-2. Hyperarousal	0.61
SOTS-3. Affect dysregulation	0.82
SOTS-4. Impulsivity	0.81
SOTS-5. Avoidance	0.90
SOTS-6. Numbing	0.91
SOTS-7. Dissociation	0.90
SOTS-8. Altered self-perception	0.86
SOTS-9. Altered interpersonal relations	0.87
SOTS-10. Altered sexual relations/behavior	0.84
SOTS-11. Altered sustaining beliefs	0.89
SOTS-12. Somatic dysregulation	0.89

Note: $N = 30$; SOTS = Symptoms of Traumatic Stress Scale; ICC = Intraclass Coefficient; *DSM* = Diagnostic and Statistical Manual of Mental Disorders, IV = 4th Edition, 5 = 5th Edition; PTSD = posttraumatic stress disorder.

Table 2

Validity Correlations of SOTS Composite Scores with Self-Report Measures

Measure	SOTS Total	SOTS DSM-IV		SOTS DSM-5		SOTS ICD-11 cPTSD
		PTSD	cPTSD	PTSD	PTSD-Diss	
PDS	0.61***	0.66***	0.50**	0.67***	0.67***	0.69***
PDS-B	0.48**	0.59***	0.36*	0.63***	0.62***	0.71***
PDS-C	0.57***	0.60***	0.48**	0.63***	0.64***	0.63***
PDS-D	0.48**	0.48**	0.41*	0.40*	0.40*	0.43*
BDI	0.48**	0.46*	0.43*	0.56***	0.55***	0.50***
DES	0.29	0.37	0.22	0.34	0.37	0.37
RSES	-0.55***	-0.46*	-0.52*	-0.64***	-0.64***	-0.58***
DEERS	0.42*	0.49**	0.33	0.49**	0.47***	0.46***
Health	0.46*	0.31	0.48**	0.28	0.38*	0.11
MD Care	0.31	0.12	0.37*	0.15	0.27	0.06

Note: $N = 30$ except for DES, $N = 28$ due to missing data. SOTS = Symptoms of Traumatic Stress Scale; DSM = Diagnostic and Statistical Manual of Mental Disorders, IV = 4th Edition, 5 = 5th Edition; ICD-11 = International Classification of Diseases, 11th Edition; PTSD = posttraumatic stress disorder, cPTSD = complex PTSD, PTSD-Diss = PTSD Dissociative Subtype; PDS = Posttraumatic Stress Diagnostic Scale, B = Criterion B items, C = Criterion C items, D = Criterion D items. BDI = Beck Depression Inventory. DES = Dissociative Experiences Scale. RSES = Rosenberg Self-esteem Scale; DEERS = Difficulties with Emotion Regulation Scale; Health = physical health; MD Care = currently under a doctor's care.

*** $P < 0.001$ ** $P < 0.01$ * $P < 0.05$