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Reliability and Validity of the Korean Version of the Symptom Checklist-Post-Traumatic Stress Disorder Scale

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The Symptom Checklist - Post-Traumatic Stress Disorder Scale (SCL-PTSD), also known as Crime-Related PTSD Scale has been validated in survivors of interpersonal trauma in the general population. However, the psychometric properties have not been investigated in a clinical setting for patients with PTSD from diverse traumatic events. This study investigates the reliability and validity of the Korean version of the SCL-PTSD among 104 psychiatric outpatients with PTSD, caused by interpersonal (n = 50) or non-interpersonal trauma (n = 54). Self-report data of the SCL-PTSD, Beck Depression Inventory (BDI), State-Trait Anxiety Inventory (STAI), and Impact of Events Scale-Revised (IES-R) were gathered. The Korean version of the SCL-PTSD showed excellent internal consistency and moderate-to-good four-week temporal stability in both the interpersonal and non-interpersonal trauma groups. In comparison with other diagnostic groups, the scores of the SCL-PTSD were significantly higher compared to those of adjustment disorder, depression, other anxiety disorders, and schizophrenia, demonstrating its criteria-related validity. Convergent validity was confirmed because the scores of the SCL-PTSD were significantly correlated with BDI, SAI and TAI scores. Concurrent validity was demonstrated by significant correlation with the IES-R score. This study demonstrated the favorable psychometric prosperities of the Korean version of the SCL-PTSD, supporting its use in clinical research and practice.

Keywords: Symptom Checklist-90-Revised, Post-Traumatic Stress Disorder; Reliability and Validity; Trauma; Questionnaires

INTRODUCTION

Post-traumatic stress disorder (PTSD) is characterized by specific sets of symptoms that develop after exposure to actual or threatened death, serious injury, sexual violence, or work-related aversive details. The core symptoms of PTSD are re-experiencing, avoidance, negative alterations in cognitions and mood, and increased arousal (1). According to a US epidemiological study, 60.7% of men and 51.2% of women in the general population have experienced at least one traumatic event in their lifetime, and the life-time prevalence of PTSD in the US general population is 7.8% (2). In Korea, one epidemiological study reported a life-time trauma experience rate of 78.8% and a life-time PTSD prevalence of 4.7% among adults living in an urban area (3).

PTSD is far more prevalent in clinical populations. In primary care, the adjusted current prevalence rate for full or subsyndromal PTSD is 11.8% (4). Nearly one-third of psychiatric outpatients are diagnosed with lifetime history of full (20%) or subthreshold (9%) PTSD (5). Despite the high rates of PTSD is reported among psychiatric patients, most public mental health facilities and psychiatric clinics do not routinely evaluate for history of trauma or PTSD or provide specialized trauma-related services (6). This is in part due to difficulties encountered by clinicians when a PTSD diagnosis is needed. First, PTSD typically co-exists with other psychiatric disorders (7). Therefore, the initial clinical presentation might be comorbid psychiatric disorder such as depression, substance abuse, or other anxiety disorders. Second, patients often do not associate their symptoms with traumatic experiences and because of denial and minimization or out of shame, they can be reluctant to disclose their traumatic events. Third, mental health professionals receive inadequate training about trauma assessment and diagnosis of PTSD (8). Fourth, as with measures of trauma response, patients sometimes misunderstand the questions being asked because they are not familiar with post-traumatic symptoms and manifestations (9).

Given these difficulties in recognizing and thus diagnosing PTSD, reliable and valid psychological instruments are needed for clinicians and researchers. A variety of self-report measures have been developed for this purpose including the Impact of Events Scale-Revised (10), the Mississippi Scale for Combat-

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Related PTSD Scale (11), the Traumatic Stress Schedule (12), the PTSD Symptom Scale (13), and the Post-traumatic Diagnostic Scale (14), the Davidson Trauma Scale (15), and the PTSD Checklist-Civilian Version (16).

Although these instruments have undergone psychometric evaluation and demonstrated good reliability and validity, their usefulness in limited in clinical settings; all these tools begin with asking about trauma exposure. However, under-reporting and sometimes over-reporting of trauma exposures occur, and asking directly about past traumas can emotionally overwhelm patients or make them feel stigmatized (17). Thus, screening for PTSD without referring to traumatic stressors would include more respondents, who might otherwise avoid disclosure and recognition of traumatic events and post-traumatic reactions. In addition, although all of above measures can be useful for assessing PTSD in a variety of settings, not all clinicians have the resources to include a specific measure of PTSD in their routine assessments. If PTSD screening were possible using an established instrument designed to measure general psychological symptoms, it would give clinicians easier access to PTSD screening.

The Symptom Checklist-PTSD scale (SCL-PTSD) serves this purpose (18), because it is a derived from the Symptom Checklist-90-Revised (SCL-90-R), a widely used measure of a variety of psychological symptoms from depression to psychoticism (19). The SCL-PTSD comprised 28 items chosen from the original 90 items in the SCL-90-R, which are the items that best discriminate between participants with crime-related PTSD and those with crime history but no PTSD (18). The SCL-PTSD can be used as a quick index of PTSD severity without the need for a separate assessment instrument and has the advantage of omitting the need for detailed information about trauma experiences (20).

The Keane PTSD scale (PK) of MMPI (21) similarly has the advantage that its 46 items were derived from the MMPI, which is a widely used and tested psychological measure of general psychopathology (22). The initial psychometric data supported the clinical use of the scale (23); however, later studies failed to demonstrate its validity for assessing PTSD, demonstrating wide variation in cut-off scores depending on the population studied (24). Further, the PK scale did not discriminate PTSD from depression and anxiety among patients with major depression (25), and it failed to demonstrate discriminant validity and diagnostic utility among college students with a history of trauma (26).

Although the SCL-PTSD has received support in the literature for its psychometric properties, including internal consistency, concurrent validity, and criterion validity, the data on which it is based were largely obtained from community or college samples and were limited to crime-related events, such as physical or sexual interpersonal violence (18,20). In addition, previous studies have not assessed the test-retest reliability or cross-cultural validity of the SCL-PTSD.

The purpose of the present study was to test the reliability and validity of the Korean version of the SCL-PTSD, also known as Crime-Related PTSD scale (18), among adult outpatients with PTSD due to various traumatic events, in Korea.

MATERIALS AND METHODS

Subjects

The participants in this study were recruited from a psychiatric outpatient unit of Hanyang University Guri Hospital, Guri, Korea. During the three-year period, a consecutive sampling of newly visiting outpatients with PTSD and other diagnoses was obtained after approval from the institutional review board (IRB) of the same hospital. All the participants were given the explanation of the study purpose and procedures and provided informed consent to participate in the research.

Inclusion criteria were a current diagnosis of PTSD, depressive disorder, anxiety disorder, adjustment disorder, or schizophrenia and age from 16 to 64 years. Each diagnosis was made using the Structured Clinical Interview for DSM-IV Axis I Disorders-Clinical Version (SCID-I, CV) by a psychiatric specialist (27). Patients with severe medical conditions, neurological disease, organic mental disorder, intelligence quotient (IQ) below 70, or inability to read or write were excluded.

The study sample consisted of 104 patients with PTSD and 265 patients with other DSM-IV diagnoses. The mean age of the participants was 39.2 years (SD = 13.3) and women composed 65.6% of the sample. The diagnostic distribution and other demographic data are shown in Table 1. A non-random sample (n = 41) of patients with PTSD was retested four weeks after baseline administration of the SCL-PTSD in order to evaluate the test-retest reliability. The most common index trauma was motor vehicle accident (42.3%), followed by physical assaults (30.8%), sexual assaults (12.5%), other accidents (5.9%), childhood abuse (4.8%), and others (3.8%). We divided the sample dichotomously according to whether the trauma was interpersonal, 50 with interpersonal trauma (physical assaults, sexual assaults, and childhood abuse) and the remaining 54 with non-interpersonal trauma (accidents and others), and tested the internal consistency and validity of these two groups separately.

Measurement

The Symptom Checklist - Post-Traumatic Stress Disorder scale (SCL-PTSD)

The Korean version of the SCL-PTSD was developed by importing the 28 items corresponding to the original SCL-PTSD from the Korean version of the SCL-90-R (28). As in the original SCL-PTSD, examinees were instructed to indicate for each item "how much that problem has distressed or bothered you during the past seven days including today?" on a scale from 0 (not at all)

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Table 1. General characteristics of the outpatients with major DSM-IV disorders (n = 369)

Variables	No.*	%
Diagnoses		
Post-traumatic stress disorder	104	28.2
Depressive disorder	119	32.2
Anxiety disorder	87	23.6
Adjustment disorder	31	8.4
Schizophrenia	28	7.6
Sex		
Male	152	40.9
Female	217	58.5
Marital status		
Married	202	54.7
Separation or divorced	25	6.8
Widowed	7	1.9
Never married	120	32.5
Religion		
Christ	116	31.4
Catholic	26	7.0
Buddhism	82	22.2
Others	9	2.4
None	117	31.7
Job		
Employed	148	40.1
Unemployed	61	16.5
Students or homemaker	136	36.9
Education		
Less than high school	92	24.9
High school graduate	157	42.5
More than college graduate	100	27.1

*The total of cases might not be 369 due to missing data.

to 4 (extremely). The reliability test provided evidence of good internal consistency, with the Cronbach's α coefficient of 0.92 for male and 0.91 for female participants (20). Preliminary support was also shown for the concurrent validity of the SCL-PTSD with the IES (29); the SCL-PTSD and the IES do not differ in discriminatory power for identifying PTSD status; furthermore, the IES yielded more false positives than did the SCL-PTSD.

Beck Depression Inventory

The Beck Depression Inventory (BDI) is a 21-item self-report questionnaire that is the most commonly used measure for depressive symptoms. The items are each presented with four choices, asking the respondents to choose the statement closest to their condition over the last week (30). The Korean version of the BDI has been shown to have good internal consistency (Cronbach α = 0.85) in the general population (31).

State-Trait Anxiety Inventory

The State-Trait Anxiety Inventory (STAI) was initially conceptualized for the study of anxiety in adults (32). The STAI consists of 20 questions assessing trait anxiety and 20 assessing state anxiety. "State anxiety" refers to the type of anxiety being experienced at the present time, and "trait anxiety" refers to the type experienced in general. The Korean version of the STAI exhibited excellent internal consistency (Cronbach α = 0.91) among psychiatric patients from multiple centers. (33).

The Impact of Event Scale-Revised

The Impact of Events Scale-Revised (IES-R) consists of 22 items that measure the symptoms of DSM-IV defined post-traumatic stress disorder, including intrusion, avoidance, numbing, and hyper-arousal with respect to particular life-threatening events (10). The Korean version of the Impact of Event Scale-Revised showed high internal consistency (Cronbach α = 0.93) among patients with PTSD (34).

Analysis

For the Korean version of the SCL-PTSD, we calculated Cronbach's α to indicate internal consistency and Pearson's correlation coefficient to indicate four-week test-retest reliability. Convergent validity was assessed based on the degrees of correlation of SCL-PTSD score with those of anxiety and depression. Criterion validity was assessed by comparing SCL-PTSD scores of persons having PTSD to those with other psychiatric diagnoses, using one-way ANOVA and post-hoc testing. We also assessed concurrent validity base on the correlation between SCL-PTSD and IES-R scores. The alpha level set for statistical tests was 0.05 (two-tailed).

Ethics statement

The study protocol was approved by the institutional review board of Hanyang University Guri Hospital (IRB No. 2009-09-02). Informed consent was exempted by the board.

RESULTS

Reliability

The Korean version of the SCL-PTSD showed excellent internal consistency among patients with PTSD (Cronbach's α = 0.94) including those with interpersonal (Cronbach's α = 0.93) or non-interpersonal trauma (Cronbach's α = 0.95). And the four-week temporal stability was moderate to good ($r = 0.64$, $P < 0.001$) among the 41 PTSD patients who completed follow-up evaluations.

Validity

Compared with the other diagnostic groups, the SCL-PTSD scores of participants with PTSD were significantly higher, demonstrating the criterion validity against other clinical disorders (Table 2). Convergent validity was confirmed by the significant correlation of SCL-PTSD score with BDI ($r = 0.76$, $P < 0.001$), SAI ($r = 0.32$, $P = 0.004$) and TAI ($r = 0.52$, $P < 0.001$) scores. Concurrent validity was shown by correlation with IES-R score ($r = 0.73$, $P < 0.001$). In the subsample analysis, the SCL-PTSD scores of both the interpersonal and non-interpersonal trauma groups were correlated with the other scales (Table 3).

Table 2. Mean comparisons of SCL-PTSD scores among diagnostic groups

Variables	Post-traumatic stress disorder (n = 104)	Adjustment disorder (n = 31)	Depressive disorder (n = 119)	Anxiety disorder (n = 87)	Schizophrenia (n = 28)	ANOVA	Post-hoc test
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
SCL-PTSD	87.12 ± 22.61	69.68 ± 22.42	76.88 ± 20.63	64.23 ± 19.39	60.83 ± 24.92	F = 17.58 $P < 0.001$	PTSD > Ad* PTSD > D* PTSD > An† PTSD > Sch†

SCL-PTSD, Symptom Checklist-Post-Traumatic Stress Disorder scale; PTSD, post-traumatic stress disorder; Ad, adjustment disorder; D, depressive disorder; An, anxiety disorder; Sch, schizophrenia.
*Significant statistical difference with $P < 0.01$; †Significant statistical difference with $P < 0.001$.

Table 3. Correlation among SCL-PTSD score and other scale scores

Scales		SCL-PTSD	BDI	SAI	TAI
BDI	Total (n = 104)	0.78† (0.66-0.86)			
	Interpersonal (n = 50)	0.80† (0.67-0.91)			
	Non-interpersonal (n = 54)	0.74† (0.50-0.88)			
SAI	Total (n = 104)	0.25 (0.001-0.47)	0.32* (0.06-0.55)		
	Interpersonal (n = 50)	0.38* (0.03-0.64)	0.40* (0.03-0.68)		
	Non-interpersonal (n = 54)	0.18 (-0.22-0.54)	0.27 (-0.17-0.63)		
TAI	Total (n = 104)	0.44† (0.26-0.60)	0.33† (0.07-0.59)	0.61† (0.44-0.76)	
	Interpersonal (n = 50)	0.53† (0.29-0.72)	0.57† (0.33-0.75)	0.76† (0.57-0.88)	
	Non-interpersonal (n = 54)	0.36 (0.08-0.62)	0.11 (-0.29-0.50)	0.55† (0.32-0.76)	
IES-R	Total (n = 104)	0.67† (0.52-0.79)	0.53† (0.33-0.68)	0.20 (-0.07-0.41)	0.14 (-0.16-0.45)
	Interpersonal (n = 50)	0.68† (0.43-0.86)	0.45* (0.20-0.67)	0.19 (-0.18-0.50)	0.29 (-0.12-0.61)
	Non-interpersonal (n = 54)	0.74† (0.50-0.88)	0.62† (0.32-0.80)	0.20 (-0.10-0.50)	0.02 (-0.38-0.50)

Values are Pearson's *r* values and its 95% confidence interval.
SCL-PTSD, Symptom Checklist-Post-traumatic Stress Disorder scale; BDI, Beck Depression Inventory; STAI, State-Trait Anxiety Inventory; IES-R, Impact of Events Scale-Revised.
*$P < 0.05$; †$P < 0.01$.

DISCUSSION

The present study demonstrated the sound reliability and validity of the Korean version of the SCL-PTSD among psychiatric outpatients, supporting its use in clinical research and practice in the Korean-speaking clinical population. The internal consistency of the SCL-PTSD was excellent; the Cronbach α was 0.94, which is comparable to the range 0.91-0.92 previously found for college students (20), as well as with the 0.93 and 0.94 found for women survivors of violence (29,35). Additionally, our finding of excellent Cronbach's α (0.95) for the subgroup of PTSD patients with non-interpersonal trauma supports the construct validity of the SCL-PTSD for use with non-crime related PTSD.

Regarding the temporal stability of the SCL-PTSD, which to our knowledge has not been investigated previously, our results showed moderate four-week test–retest reliability ($r = 0.63$). This finding substantially suggests the fact that all the participants received some kind of treatment, such as psychotherapy or medication during the four-week period.

The strength of the Korean version of the SCL-PTSD lies in its criteria-related validity against other psychiatric disorders, particularly adjustment disorder. Adjustment disorder is caused by stressful, but not traumatic events. Research has suggested that self-reports of PTSD do not distinguish between similar psychological reactions to traumatic versus non-traumatic events. For example, the Post-traumatic Stress Diagnostic scale did not discriminate between reactions to DSM-IV-congruent traumatic versus reactions to non-traumatic events; furthermore, the scores, indicating the level of post-event reaction, were higher in the non-traumatic group (36). Thus, the diagnostic utility of the SCL-PTSD scale exceeds those of other self-report PTSD scales, even though it is a subscale instrument developed from general psychological measure. Additionally, the SCL-PTSD provides the ability to screen for PTSD without reference to traumatic events, thus minimizing patient' discomfort in recalling distressful memories and triggering undesirable responses, such as avoidance or under-reporting.

In this study, SCL-PTSD score was more strongly correlated with BDI ($r = 0.78$) score than with IES-R ($r = 0.67$) score, another PTSD scale. This is probably due to lack of specificity of the BDI (37) (e.g., the BDI also measures general distress), the overlapping of PTSD and depressive symptoms, and the high rate of comorbid depression among PTSD patients.

Development of self-report scales with psychometric soundness is also in line with dimensional assessment of PTSD (and all other disorders) promoted in DSM-5 (38). Although SCL-PTSD scale does not include individual diagnostic criteria of DSM, excellent diagnostic utility differentiating PTSD from other disorders supports dimensional assessment in differentiating diagnosis. Likewise, dimensional measure such as this scale

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will reflect clinically meaningful aspects of the disorder, such as severity of illness, subclinical status, and temporal change (38).

The limitations of this study include the following. First, the sample in the study was from a psychiatric outpatient unit, representing narrow spectrum of the PTSD population. Second, although we included a self-report PTSD scale to evaluate concurrent validity, we did not administer any interview-based PTSD scale. Finally, we did not investigate the factorial validity of the scale due to inadequate sample size.

Further studies are needed to establish a cut-off point SCL-PTSD scores for diagnosis of PTSD and to determine its concurrent validity with DSM-5 PTSD measures and other PTSD scale validated in Korean language (39). In addition, the factor structure of the scale needs further validation although at least one study has suggested a unidimensional model base on college students (20).

The Korean version of the SCL-PTSD is a measure with good psychometric properties that can be used as a reliable, valid, and time-saving tool to assess PTSD. The data collected in our study can serve as a baseline for comparison with clinical samples in future studies of the Korean population. This study provides evidence of good psychometric prosperities of the Korean version of the SCL-PTSD, supporting its use in clinical research and practice.

DISCLOSURE

The authors have no potential conflicts of interest to disclose.

AUTHOR CONTRIBUTION

Study concept and design: Kim D, Bae H, Han CW. Acquisition, analysis, or interpretation of data: Kim D, Jang E, Park JE, Han CW, Kim SH. Writing or revision of the manuscript: Chang JH, Kim D. Administrative, technical, or material support: Bae H, Kim SH. Study supervision: Kim D, Jang E. Manuscript approval: all authors.

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