Reliability and Validity of Child Posttraumatic Stress-Revised Instrument in Malay Language among Malaysian Adolescents

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Abstract

Background: Most PTSD screening tools for children and adolescents have been validated in Western contexts which is not necessarily generalizable to non-western cultures. Therefore, the objective of this cross-sectional study was to determine the psychometric properties of the Child Posttraumatic Stress Disorder Reaction Index (CPTS-RI) within a Malaysian population.

Methods: Eighty-five adolescents aged 13- to 14-years-old completed the CPTS-RI, Harvard Trauma Questionnaire (HTQ) and Hopkins Symptom Checklist scale (HSCL). Results: Results showed a good internal consistency for the overall scale ($\alpha = .92$), for the subscale re-experience, avoidance and arousal subscales ($\alpha = .89$, $\alpha = .73$, $\alpha = .56$ respectively) and for different gender groups and ethnicity. CPTS-RI demonstrated good construct and divergent validity, and showed good concurrent validity with the use of HTQ and HSCL as the criterion measure. Conclusion: Findings suggest that CPTS-RI is a valid and reliable instrument to assess PTSD symptoms among Malaysian adolescents.

Keywords: Validity, Reliability, CPTS-RI, Malaysian Adolescents

Introduction

Post-traumatic stress disorder (PTSD) is a psychological disorder in which an individual develops a prolonged stress response syndrome after life-threatening events. Following lifetime exposure to traumatic events, PTSD is a common diagnosis for some individuals¹⁻². Previous studies report that children and adolescents are highly exposed to traumatic events. Estimates suggest approximately 40-90% of the population has a history of at least one lifetime trauma exposure¹⁻⁴. Recent studies conducted in the Asian region report that the prevalence of exposure to at least one traumatic event is also high, in the range of 78.1% in India⁵, 82% in China⁶, 77% in Japan⁷ and 83% in Malaysia⁸.

Children and adolescents who have a history of traumatic or negative life events are vulnerable to the development of PTSD⁹. Empirical data has shown that individuals who experience traumatic events during childhood or adolescence suffer from more severe forms of PTSD than those who experience trauma later in life¹⁰. Child and
adolescent PTSD is widely prevalent\(^2\) and is associated with significant psychosocial impairment such as functional impairment in social, educational, adjustment and interpersonal capacities that could have some negative impacts throughout their lifetime\(^1\).

Assessment of pediatric PTSD calls for a specialized instrument, particularly due to the differences in PTSD suffered by adolescents and adults\(^1\). A self-report instrument for children is also essential for psychiatric services in developing countries such as Malaysia, where the availability of PTSD assessments are scarce. A self-report instrument is easy to use in many different settings such as schools, hospitals and research. Most self-report PTSD measures were developed and validated in Western countries\(^1\), whereas PTSD assessment tools have to be culturally sensitive according to the local norms\(^1\).

One of the most widely used PTSD measures is the Child Post-Traumatic Stress Disorder Reaction Index (CPTS-RI), developed to assess post-traumatic reactions in children aged 6-16\(^1\). Previous studies have shown that the CPTS-RI has high internal consistency (\(r = 0.87\)), test-retest reliability (\(r = 0.67\)), and strong concurrent validity (\(r = 0.76\))\(^1\). CPTS-RI was empirically validated corresponding to the PTSD diagnosis in DSM-III, and does not reflect the new differences in the diagnostic criteria of PTSD according to DSM-IV\(^1\). Most studies on the psychometric properties of the CPTS-RI were conducted with a Western sample. Therefore, the purpose of this study was to investigate the validity and test-retest reliability of the Malay language version of CPTS-RI in a sample of Malaysian adolescents.

**Methods**

**Participants**

A multistage sampling was used to select participants of the study. There were 41 secondary schools in Kuching district, and 12 schools were randomly selected (the fourth school in the list). Only six schools agreed to participate. Sampling size was determined based on the work of Everitt (1975)\(^1\), Gorsuch (1983)\(^1\), and the most recent one, Bryant & Yarnold (1995)\(^2\). According to these authors, analyses for validity study should be based on the number of items. In CPTS-RI, there are 17 items. These authors argued that each item should have minimum 5 participants. Thus, 85 samples are sufficient enough for validity and reliability analyses. Consent forms were received from 85 (77%) of 111 parents and children invited to participate. A total of 85 adolescents aged from 13 to 14 (26 males, 59 females) participated in this study. Adolescents were from the Malay (32.9%), Bidayuh (22.4%), Iban (22.4%) and Chinese (22.4%) ethnic groups.

**Procedures**

Written consent from parents, caregivers and children was prerequisite. The consent form explained the voluntary and confidential nature of their participation, and the procedures of the study. A date for data collection was set upon receipt of consent forms. After the first visit, a second round of data was collected ten days later. This study was approved by the Ethics Committee of the Faculty of Medicine and Health Sciences, University Malaysia Sarawak, the Malaysian Ministry of Education and the Sarawak Education Department.
Measures

Sociodemographic characteristics. This part included age, gender, ethnicity, and living arrangement.

The Child Posttraumatic Stress Reaction Index (CPTS-RI). CPTS-RI is designed to discover the presence of PTSD symptoms. Questions include items for each of the three main subscales, re-experience (Criterion B-7 items), symptoms of numbing and avoidance (Criterion C-5 items), and physiological arousal (Criterion D-5 items) with the cut-off score of 40. This questionnaire was designed to discover if PTSD symptoms were present during the data collection. Items were scored on a five-point Likert scale ranging from 0–80 aggregate, with 12–24 indicative of mild PTSD symptoms, 21–39 as moderate, 40–59 as severe and 60–80 indicative of very severe PTSD symptoms. Child and adolescent PTSD could be assessed manually as meeting the DSM-IV criteria for PTSD, with an item score greater than or equal to three to count as a symptom for a diagnosis. A subclinical level of PTSD is obtained if the respondent meets two out of three criteria and misses the last criterion by only one symptom. The subclinical evaluation does not apply to the re-experiencing subscale, which must be reached.

Harvard Trauma Questionnaire (HTQ). HTQ is a self-report measurement to screen individual traumatic symptoms. There are 16 items in the HTQ which participants rate on a 4-point Likert scale from 1 (not at all) to 4 (very often). These sixteen items correspond to the three major symptoms of PTSD in DSM IV: avoidance (7 items), re-experiencing (4 items), and hyper vigilance (5 items). Participants were requested to keep the most traumatic event in mind when answering the questionnaire. Total scores from the 16 items were summed up, and divided into 16. The cut-off score of the HTQ is 2.5. The scale has been shown to be reliable and valid. The internal consistency of this questionnaire in the present study was high (α = .94).

The Hopkins Symptoms Checklist-25 (HSCL). The HSCL is a 25-item self-report inventory that assesses symptoms of anxiety (item 1–item 10) and depression (item 11-item 25) on a 4-point Likert scale. A cut-off score of 1.75 is used to identify clinically significant symptoms especially for Southeast Asian populations. The internal consistency of this questionnaire in the present study was high (α = .90).

Translation and back-translation

All the instruments were translated into the Malay language (Bahasa Malaysia) and back-translated by two academicians who are experts in both English and Malay languages. The content validity of the translated version was evaluated and tested before the actual study was conducted.

Statistical analysis

All analyses were conducted using the Statistical Program for the Social Sciences (SPSS, version 16.0). Data were double entered to identify data entry errors. Frequencies and any inconsistent variables were explored using list-wise deletion. A descriptive analysis of frequency, means, and standard deviations of sociodemographic characteristics, CPTS-RI and HTQ scores were analysed. Cronbach’s alpha and item-total correlation coefficients were used for estimation of internal consistency. Alpha value less than .5 was considered insubstantial, .5-.6 was poor, .6-.7 moderate, .7-.8 acceptable, .8-.9 good and over .9 was considered excellent. Cohen’s
kappa and Pearson’s correlation tested the inter-rater and test-retest reliability between the first and second CPTS-RI administrations. Concurrent validity was assessed by conducting the correlation with other measures that have previously been well validated.

**Results**

**Descriptive statistics**

The analysis showed that 9.4% ($n= 8$) of the adolescents met the full criteria for PTSD (endorsing all items) and 14.1 % ($n = 12$) met the subclinical level of PTSD according to the manual diagnosis of DSM-IV PTSD criteria (endorsing most items including at least one re-experiencing criteria). The use of cut off-score (i.e., total score equal or more than 40) showed that 7.1% of the participants sample reported severe PTSD symptoms. The mean symptom score and number of symptoms endorsed for subjects who met full criteria for PTSD was significantly higher than the mean score for those who did not meet the full PTSD criteria, $t (83) = 7.25, p < .001$.

**Reliability**

**Internal consistency.** Cronbach’s alpha indicated excellent internal consistency for the overall CPTS-RI scales ($\alpha = .92$). Cronbach’s alpha indicated good internal consistency for the CPTS-RI re-experience subscale ($\alpha = .89$), and avoidance subscale ($\alpha = .73$), but a slightly poor internal consistency for the arousal subscale ($\alpha = .56$).

The Cronbach’s alpha for the CPTS-RI total scale showed excellent range of internal consistency for female ($\alpha = .91$) and male ($\alpha = .92$) and across ethnicity (Malays: $\alpha = .94$, Chinese: $\alpha = .89$, Bidadayuh: $\alpha = .84$, Iban: $\alpha = .89$ and others: $\alpha = .89$) and different living condition (with both parents: $\alpha = .91$, with one parents: $\alpha = .93$ and in an institution or other: $\alpha = .98$).

**Test-retest reliability.** The CPTS-RI was re-administered 10 days after the first administration to reduce the likelihood of other interference (i.e. other potential trauma) to the present sample (25). Subjects were asked to complete the CPTS-RI about the same traumatic event each time. A total of 85 valid retests were collected. The test-retest reliability of emotional distress diagnosis obtained from CPTS-RI was assessed using Kappa, a chance-corrected measure of agreement. A Kappa of .56 between diagnoses for the two administrations (i.e. $t_0$ and $t_1$) was obtained, with 90.6% agreement, indicating an excellent degree of reliability. The Pearson correlation coefficient for the CPTS-RI at $t_0$ and $t_1$ showed acceptable correlation ($r = .62$, $p < .001$).

**Validity**

**Construct validity.** Pearson correlation analysis showed that the re-experience, avoidance and arousal subscales were well correlated (see Table 1). As such, these three subscales appeared to contain items that reliably identify common core variables, thereby implying construct validity. A visual inspection of the correlation matrix showed that all the items correlated with one another and none of the items correlated very highly (.90) nor very low (< .25) which diminished the concern for singularity of the questionnaire. Also, no item in the questionnaire needed to be eliminated to improve the reliability of the questionnaire.
Table 1. Pearson’s correlations between CPTS-RI subscales scores and HSCL subscales (N=85).

<table>
<thead>
<tr>
<th></th>
<th>CPTSRI-Total</th>
<th>CPTSRI-Re-experience</th>
<th>CPTSRI-Avoidance</th>
<th>CPTSRI-Arousal</th>
<th>HSCL</th>
<th>HSCL-Anxiety</th>
<th>HSCL-Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPTSRI-Total</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPTSRI-Re-experience</td>
<td>.85**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPTSRI-Avoidance</td>
<td>.58**</td>
<td>.68**</td>
<td>1</td>
<td>.61**</td>
<td>.30**</td>
<td></td>
<td>.94**</td>
</tr>
<tr>
<td>CPTSRI-Arousal</td>
<td>.77**</td>
<td>.58**</td>
<td>.61**</td>
<td>.30**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSCL</td>
<td>.58**</td>
<td>.60**</td>
<td>.61**</td>
<td>.30**</td>
<td>.94**</td>
<td></td>
<td>.84**</td>
</tr>
<tr>
<td>HSCL-Anxiety</td>
<td>.53**</td>
<td>.55**</td>
<td>.54**</td>
<td>.31**</td>
<td>.94**</td>
<td></td>
<td>.84**</td>
</tr>
<tr>
<td>HSCL-depression</td>
<td>.58**</td>
<td>.60**</td>
<td>.61**</td>
<td>.28**</td>
<td>.98**</td>
<td>.84**</td>
<td>1</td>
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*p < .05. ** p < .001

Divergent validity. To examine the divergent validity, correlation between the CPTS-RI total score and subscale scores with anxiety (HSCL-Anxiety) and depression (HSCL-depression) was carried out (Table 1). The correlation of anxiety and depression was lower than the correlation within the subscales. These results provided preliminary support for the divergent validity of the CPTS-RI, in that it appeared to be measuring a construct different from depression and anxiety.

Concurrent validity. The diagnostic performance of the CPTS-RI was assessed by comparing with HTQ score. A Kappa of .53 with 97% agreement between the CPTS-RI and HTQ was obtained, indicating a good degree of reliability. The analysis of concurrent validity revealed significant correlation between CPTS-RI and HTQ scale (r = .54, p < .001).

Discussion

The key finding in this study was that CPTS-RI has good psychometric properties to measure severity of PTSD symptoms among adolescents according to Malaysian norms. The total score of the scale and subscales demonstrated good internal consistency and test-retest reliability except for the arousal subscale. One reason for this might be because this subscale consists of only five items. Insufficient quantity of questions has been shown to reduce consistency regardless of question. The Cronbach’s alpha showed an excellent internal consistency for boys and girls, different ethnic groups and living conditions, suggesting that the items of the CPTS-RI measure a coherent underlying construct of posttraumatic distress.

The CPTS-RI was originally developed according to DSM-III-R, so the instrument does not directly map to the DSM-IV PTSD criteria. Therefore, this was one of the objectives of the present study. The present study found that both the manual diagnosis of DSM-IV PTSD criteria and the cut-off score were able to discriminate adolescents
with and without PTSD symptoms. The CPTS-RI was able to provide severity scores for each of the three main symptoms criteria (re-experience, avoidance and hyper-arousal) as well as the total score.

The CPTS-RI demonstrated very good construct, divergent and concurrent validity. The correlations between the subscales were good to excellent, indicating good convergent validity of the scale. CPTS-RI also showed its ability to discriminate between adolescents who meet full PTSD criteria and those who do not according to DSM-IV diagnosis of PTSD with HTQ as the reference, thus further demonstrating the convergent validity.

PTSD is highly comorbid with other psychological disorders, such as depression and anxiety28. Empirical studies have shown that depression and PTSD are related but independent reactions to trauma29. That may explain why the correlation between PTSD score and HSCL-depression and HSCL-anxiety scores were significant. However, the r-values of CPTS-RI score with HSCL-subscscales scores were comparatively lower than the r-values of correlation within the subscales of CPTS-RI, supporting the divergent validity of the scale.

HTQ was chosen as the criterion measure to test the concurrent validity of CPTS-RI as it is a valid and widely used self-report instrument measuring PTSD across a variety of traumas, with good psychometric properties among adolescents30, 31. In the final analysis of the present study, CPTS-RI showed good concurrent validity in assessing adolescent PTSD symptoms. Previous validation studies have demonstrated good concurrent validity of CPTS-RI with other instruments. For example, the concurrent validity between CPTS-RI and the Clinician Administered PTS Scale-Child Adolescent (CAPS-CA) was established (r = .76) in a French study with a sample of school-age children16. The CPTS-RI was used as a criterion measure to test the concurrent validity of the Posttraumatic Stress Symptoms in Children (PTSS-C) among two different cultural samples in Sweden and Iraqi Kurdistan. It was reported that CPTS-RI demonstrated an excellent concurrent validity between both instruments32. Taken together with the present findings, CPTS-RI is shown to be a reliable and valid assessment of PTSD symptoms.

One of the caveats of this study was the small sample size covering a narrow age range (i.e. aged 13 and 14). Further studies could recruit a more diverse adolescent population if further validation is required. A formal diagnosis of PTSD through clinical interview may help to refine the construct and discriminant properties of CPTS-RI in a Malaysian population. Yet, a previous validation study has provided evidence that CPTS-RI is feasible and suitable to be used among children even when administered with a clinical interview16.

In summary, CPTS-RI is a reliable and valid instrument for assessing DSM-IV PTSD symptoms among Malaysian adolescents. Considering the high exposure to traumatic events among adolescents33, CPTS-RI is suitable especially in the Malaysian context for its ease of use, timeliness and cost-effectiveness. As a rapid self-report instrument, its utility in screening for PTSD symptoms should be of assistance to Malaysian clinicians for assessment and further treatment planning.

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