



## Comparison of ACE-IQ and CTQ-SF for child maltreatment assessment: Reliability, prevalence, and risk prediction

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### ABSTRACT

**Background:** Child maltreatment has profound effects on mental health. The Childhood Trauma Questionnaire Short Form (CTQ-SF) and the Adverse Childhood Experiences International Questionnaire (ACE-IQ) are commonly used retrospective assessment tools for evaluating child maltreatment.

**Objective:** This study aims to conduct a comprehensive comparison of the CTQ-SF and ACE-IQ, encompassing internal consistency, prevalence, and the predictive efficacy of trauma-related outcomes. It also seeks to enhance the scoring method of ACE-IQ based on the established comparability between the two instruments.

**Participants and setting:** 1484 college students from northern China were recruited, assessing demographic characteristics and outcomes related to traumatic experiences, including post-traumatic stress disorder (PTSD), complex post-traumatic stress disorder (CPTSD), borderline personality disorder (BPD), anxiety, and depression.

**Methods:** A contingency correlation analysis was performed to evaluate the degree of agreement between the CTQ-SF and ACE-IQ. Binary logistic regression models were utilized to compare the predictive capabilities of distinct instruments.

**Results:** CTQ-SF and ACE-IQ instruments display favorable internal consistency and notable correlations across shared categories. However, the predictive relationships between trauma type and adverse outcomes are inconsistent across instruments. The ACE-IQ, encompassing 13 trauma categories, demonstrate a lower AIC and BIC index, indicating a superior model fit for elucidating outcomes.

**Conclusion:** This study introduces a scoring methodology for ACE-IQ, improving the comparability of the two measures and emphasizing the importance of capturing the full range of maltreatment types a child may have experienced. These findings have significant implications for clinical and

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epidemiological research, providing valuable insights for understanding the impact of child maltreatment.

## 1. Introduction

Child maltreatment constitutes a significant public health issue that impacts hundreds of millions of children worldwide, resulting in enduring consequences such as post-traumatic stress disorder (PTSD), depression, anxiety, and personality disorders (Jaffee, 2017). The evaluation of child maltreatment is crucial for the implementation of evidence-based, trauma-informed care and research. Moreover, the variability in prevalence estimates can be partially attributed to the disparate operational definitions of child maltreatment and the divergent rating standards employed by assessment tools.

The two most widely used instruments for retrospectively assessing child maltreatment worldwide are the Childhood Trauma Questionnaire Short Form (CTQ-SF) and the Adverse Childhood Experiences (ACEs) questionnaire (Georgieva et al., 2021; Pace et al., 2022). The original CTQ was developed by Bernstein and colleagues in the 1990s and includes 70 items that use a 5-point Likert-type scale to measure the frequency of occurrence (Bernstein et al., 1998). To reduce respondent burden, Bernstein and colleagues developed the short form of CTQ with 28 items, which takes no >5 min to self-administer (Bernstein et al., 2003). It yielded five categories of child maltreatment: emotional neglect (EN), emotional abuse (EA), physical neglect (PN), physical abuse (PA), and sexual abuse (SA). Over the past two decades, the CTQ-SF has been translated into over 16 languages and has undergone extensive validity testing, demonstrating good replicability and cross-cultural internal consistency (Georgieva et al., 2021). At around the same time, Drs. Anda and Felitti developed a scoring system for ACEs that includes 10 questions representing 10 types of child maltreatment and employs a binary scoring system (Felitti et al., 1998; Finkelhor et al., 2013). Based on the original ACE questionnaire, WHO developed the Adverse Childhood Experiences International Questionnaire (ACE-IQ) to measure ACEs worldwide and intends to build a global research network (Ho et al., 2019).

Unlike the original ACE and CTQ, the ACE-IQ covers a broader range of child maltreatment, including the five types assessed by the CTQ-SF as well as family dysfunction, peer violence, community violence, and collective violence. Another difference from the original ACE questionnaire is that the ACE-IQ incorporates two scoring methods. It employs a frequency-based approach for certain items to capture the extent of traumatic experiences, while maintaining the original dichotomous method for domains associated with family environment. Since its release, the questionnaire has been rapidly and widely used and validated in multiple languages (Pace et al., 2022). However, there is still controversy over the scoring standards for the ACE-IQ. Several studies report overly high positive rates in some categories (mainly EN) and have adjusted the frequency scoring method for cultural competency, especially in Asian countries such as China (Hong Kong), South Korea, and Vietnam (Ho et al., 2019; Kim, 2017; Tran et al., 2015). This inconsistency in scoring standards creates difficulties in international comparisons of several ACEs occurrences and frequency. In contrast, the CTQ-SF has recommended cut-scores for each subscale that are widely adopted. Given that the CTQ-SF and ACE-IQ are currently the most widely used tools for assessing child maltreatment and that there is some overlap in their categories, it is necessary to compare the two in the same sample population.

On the other hand, CTQ-SF and ACE-IQ were developed based on related but distinct conceptual frameworks of childhood maltreatment which led to two research orientations, with the CTQ-SF focusing more on the links between types of maltreatment experiences and outcomes, while the ACE-IQ covers a broader range of adversities and focuses more on assessing the cumulative effect of the number of traumas in relation to the outcomes. The determination of a causal association between the type of child maltreatment and its specific consequences is subject to various factors, particularly the use of screening tools. Researchers and clinicians are currently engaged in a continuous discourse regarding the degree to which distinct forms of maltreatment are linked to specific outcomes (Conrad et al., 2017). Notably, various meta-analyses examining the relationship between child maltreatment and the risk of anxiety and depression in adulthood have yielded inconsistent findings with regard to the association between specific types of maltreatment and heightened risk (Gardner et al., 2019; Infurna et al., 2016; Lindert et al., 2014). Furthermore, the effects of child maltreatment can be cumulative. The CDC-Kaiser ACE study conducted in developed Western countries revealed a striking “dose-response” relationship between the number of ACEs and many health outcomes (Felitti, 2002). This implies that the number of instances of child maltreatment serves as a significant predictor of the emergence of mental health disorders.

As of present, there exists no empirical research that has compared the CTQ-SF and ACE-IQ. Given the aforementioned context, the current study aims to address three inquiries: 1) Which cutoff score in ACE-IQ, among the five shared categories of trauma, displays greater consistency with CTQ-SF? 2) Is there cross-tool stability and consistency in the predictive associations between types of trauma experiences identified by distinct assessment instruments and trauma-related outcomes? 3) Does the 13-category trauma model in ACE-IQ exhibit superior fit and predictive validity in relation to the five-category trauma model in CTQ-SF, with respect to the dose-response effect of ACE?

## 2. Methods

### 2.1. Participants and procedure

In this study, we utilized a self-developed WeChat mini-program-based online questionnaire platform to distribute surveys to students across more than six universities in northern China, including regions such as Beijing, Tianjin, Hebei, and Shandong. Our

target population comprised first to fourth-year university students.

The data collection occurred in two phases: in the first phase, conducted from March to April 2021, resulting in a total of 627 responses, with 617 valid responses (a validity rate of 98.41 %), and the second phase occurred from October to November 2022, yielding 884 responses, of which 867 were valid (a validity rate of 98.08 %). Validity was assessed by ensuring that no items were omitted, and we excluded questionnaires with erratic or duplicate responses. Our sampling method combined random and convenience sampling, with graduate students or counselors distributing questionnaire links and organizing class-level sampling. We successfully collected a total of 1484 valid questionnaires. These questionnaires captured data on demographic information, experiences of child maltreatment, and the presence of trauma-related disorders. Prior to distributing the questionnaires, we conducted a test to estimate completion time, which averaged around 20–30 min.

The study was granted approval by the Institutional Review Board of the Institute of Psychology, Chinese Academy of Sciences, and all participants were provided with an explanation of the study's objectives and provided informed consent.

### 3. Measures

#### 3.1. Child maltreatment assessment

##### 3.1.1. Childhood Trauma Questionnaire-Short Form (CTQ-SF)

The characteristics of CTQ-SF are summarized in Table 1. There are five items in each subscale and three additional items which measure denial and minimization but do not contribute to the total or subscore. The sum scores of each subscale range from 5 to 25 and are divided into four levels by severity according to the original manual (Bernstein et al., 2003). Scores above the recommended cut-score of “moderate to severe” (emotional neglect  $\geq 15$ ; emotional abuse  $\geq 13$ ; physical neglect  $\geq 10$ ; physical abuse, PA  $\geq 10$ ; sexual abuse  $\geq 8$ ) on each of subscale are considered cases of abuse or neglect according to the original manual (Bernstein et al., 1998; Glaesmer, 2016). This criterion is widely used in prevalence studies (Jiang et al., 2018; Zhang et al., 2020). The Chinese version of CTQ-SF is imported and developed by Zhao and colleagues, which has been confirmed to have good cultural equivalence and psychometric properties (Jiang et al., 2018; Zhao et al., 2005).

##### 3.1.2. Adverse Childhood Experience International Questionnaire (ACE-IQ)

The characteristics of ACE-IQ are summarized in Table 1. The thirteen categories are: emotional neglect (2 items, 5-point Likert scale); physical neglect (3 items, 4-Likert scale); emotional abuse (2 items, 4-Likert scale); physical abuse (2 items, 4-Likert scale); and contact sexual abuse (4 items; 4-Likert scale). The family environment includes living with a substance abuser (1 item, Yes/No); living with a household member who was mentally ill or suicidal (1 item, Yes/No); living with a household member who was imprisoned (1 item, Yes/No); parental death (1 item, Yes/No), separation or divorce (1 item, Yes/No); and domestic violence (3 items, 4-Likert scale); violence outside the home includes bullying (1 item, 4-Likert scale); witnessed community violence (3 items, 4-Likert scale); and exposure to war/collective violence (4 items, 4-Likert scale). In the binary scoring methods, if the participant answered in the affirmative (whether once, a few times, or many times) then that counts as a yes. The main difference between the two methods is the level of exposure in the Likert scale items, for example: in the item of bullying, “Were you bullied?” it will count as a yes when participants select “once,” “a few times” or “many times” in binary scoring methods. It will count as a yes when participants select “many times” in the frequency scoring methods. The Chinese version of ACE-IQ is translated and validated by Grace W.K. Ho and colleagues (Ho et al., 2019).

#### 3.2. Trauma-related outcomes

##### 3.2.1. Anxiety

General Anxiety Disorder-7 (GAD-7) is used to screen for anxiety, with a 7-item and a 4-point Likert scale ranging from “not at all” to “nearly every day”, which has been verified by many different types of samples in China and have good stability. If the GAD-7 score is higher than 5, it is considered to have symptoms of anxiety.

**Table 1**

Comparison of characteristics of CTQ-SF and ACE-IQ.

Characteristic	CTQ-SF	ACE-IQ
Designer	David P. Bernstein et al. (2003)	World Health Organization (WHO), 2018
Target population	Adults recalling childhood experiences	Adults recalling childhood experiences
Questionnaire structure	5 categories (Emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect)	13 categories (emotional neglect, physical neglect, etc.)
Scoring system	5-Point Likert scale	Yes/No, 5-point Likert scale, 4-point Likert scale
Number of items	28 items	29 items
Estimated completion time	Approximately 5–10 min	Approximately 5–10 min
Applicability and cultural sensitivity	Widely used, some cultural adaptations might be needed	International, may require adaptations for specific cultures

### 3.2.2. Depression

Patient Health Questionnaire-9 (PHQ-9) is used to screen for the presence and severity of depression, with a 9-item and a 4-point Likert scale ranging from “not at all” to “nearly every day”. The total score  $\geq 10$  considered to be depressed. It is widely used in clinical and mass screening. The Chinese version shows good reliability and validity.

### 3.2.3. Complex posttraumatic stress disorder

The International Trauma Questionnaire (ITQ) is a concise and straightforward tool utilized to evaluate CPTSD in accordance with the International Classification of Diseases, Eleventh Revision (ICD-11). The Chinese version of the ITQ has demonstrated favorable reliability and validity, as reported by [Ho et al. \(2019\)](#). The diagnosis of CPTSD is established by adhering to the criteria established by the International Trauma Consortium.

### 3.2.4. Posttraumatic stress disorder

To assess PTSD symptoms, the PTSD Checklist for DSM-5 (PCL-5) is employed. This self-report instrument consists of 20 items that evaluate the 20 symptoms of PTSD in accordance with the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). The positive criteria for diagnosis include the presence of at least one intrusion symptom, one avoidance symptom, two negative alterations in mood and cognitions symptoms, and two alterations in reactivity and arousal symptoms, with a minimum score of 2 for each symptom. [Wang et al. \(2015\)](#) have provided validated translations of the PCL-5 in Chinese ([Wang et al., 2015](#)).

### 3.2.5. Borderline personality disorder

The Mclean Screening Instrument for Borderline Personality Disorder (MSI-BPD) is utilized as a means of screening for traits associated with borderline personality disorder. This self-rating scale is founded upon the DSM-IV and consists of ten dichotomous items. A score of one is assigned when a participant responds affirmatively to a question, with the total score ranging from 1 to 10. A score of  $\geq 5$  is indicative of borderline personality traits. The MSI-BPD is a rapid and effective tool, exhibiting good sensitivity and specificity ([Zanarini et al., 2003](#)). The Chinese version of the scale has been validated in both psychiatric clinical samples and college students ([Chen et al., 2011](#)).

## 3.3. Data analysis

First, the study computed descriptive summary statistics for the entire sample, encompassing age, BMI, and family income, and presented them as mean  $\pm$  standard deviation (SD) or standard error of the mean (SEM). The distribution of gender, parental education, and the prevalence of traumatic outcomes, such as PTSD, CPTSD, BPD, anxiety, and depression, were expressed as percentages. Additionally, McDonald's omega ( $\omega$ ) was utilized to evaluate the internal consistency reliability of all scales employed in the investigation. In the second place, in order to assess the conformity of prevalence between five categories that overlap in the CTQ-SF and ACE-IQ, the prevalence of EN, EA, PN, PA, and SA in ACE-IQ was computed using various cutoff scores. To compare the association between the two categorical variables, contingency correlation analysis was conducted, utilizing Cramer's V and Pearson's chi-squared statistics. Ultimately, to investigate the correlation between maltreatment types derived from different assessment tools and trauma-related outcomes, preliminary associations were evaluated through Pearson chi-square or ANOVA. Furthermore, the study employed two binary logistic regression models to examine associations between child maltreatment types from each tool and mental health outcomes, including PTSD, CPTSD, BPD, anxiety, and depression. Model 1 used the 5 CTQ-SF trauma types, Model 2 used the 13 ACE-IQ trauma types. To compare the predictive validity between tools regarding the ACE dose-response, the CTQ-SF and ACE-IQ scores were transformed into continuous indices ranging from 0–5 and 0–13 trauma categories respectively. Another logistic regression compared the predictive effects of five types of child maltreatment, considering the trauma counts of five types as assessed by CTQ-SF (CTQ-5), the five overlapping categories with ACE-IQ (ACE-5), and the full spectrum of thirteen categories in ACE-IQ (ACE-13). Regressions then examined their associations with various mental outcomes. The Nagelkerke R<sup>2</sup>, a measure of model-fit for logistic regression models, was utilized to report the results. The goodness of fit was evaluated using the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). The lower the AIC and BIC, the more significant is the model. For categorical variables, such as sex, missing values were retained without imputation. Continuous variables, like weight and height, were imputed with the mean value. In cases involving crucial variables such as ACE-IQ and CTQ-SF, as well as datasets with a substantial number of missing entries, the entire participant's data was omitted. The statistical analysis was conducted using SPSS 26.0 and Jamovi 2.3. Statistical significance was determined at  $p < 0.05$ .

## 4. Results

### 4.1. Descriptive analyses and scale internal consistency

[Table 2](#) provides a comprehensive overview of the demographics and prevalence rates of trauma-related disorders. The sample ( $N = 1484$ ) had a mean age of  $19.5 \pm 1.58$  years (17–28) and was predominantly female (81.5 %). The mean BMI was  $21.4 \pm 3.64$  (13.1–38.8). Prevalence rates were 6.7 % for PTSD, 1.5 % for CPTSD, 18.1 % for BPD, 22.6 % for anxiety, and 10.8 % for depression ([Table 2](#)). The CTQ-SF ( $\omega = 0.88$ ) and ACE-IQ ( $\omega = 0.76$ ) demonstrated good internal consistency. The PCL-5 (0.95), ITQ (0.93), MSI-BPD (0.84), GAD-7 (0.91), and PHQ-9 (0.90) also showed high internal consistency.

#### 4.2. Correlation analysis from ACE-IQ and CTQ-SF overlapping categories and frequency scoring method modification

The item descriptions of overlapping categories in CTQ-SF and ACE-IQ are showed in the Supplementary Table. The contingency correlation analysis of the result from ACE-IQ under different levels of exposure and CTQ-SF was summarized in Table 3. The strongest correlations were seen between CTQ-SF emotional neglect and ACE-IQ “never” emotional neglect (Cramer’s  $V = 0.31$ ); CTQ-SF emotional abuse and ACE-IQ “many times” emotional abuse (Cramer’s  $V = 0.393$ ); CTQ-SF physical neglect and ACE-IQ “once” physical neglect (Cramer’s  $V = 0.337$ ); CTQ-SF physical abuse and ACE-IQ “many times” physical abuse (Cramer’s  $V = 0.397$ ); and CTQ-SF sexual abuse and ACE-IQ “once” sexual abuse (Cramer’s  $V = 0.438$ ). This analysis supports modifying the ACE-IQ frequency scoring to optimize correlations with the CTQ-SF categories.

#### 4.3. Prediction of trauma related outcomes from the two child maltreatment assessment instruments

Binary logistic regression examined associations between child maltreatment types and mental health outcomes (Table 4). Model 1 used the CTQ-SF questionnaire, covering five trauma types, while Model 2 employed ACE-IQ, which included thirteen trauma types. In Model 1 with CTQ-SF, emotional and sexual abuse were significant predictors of PTSD, CPTSD, BPD, anxiety, and depression. In Model 2 with ACE-IQ, emotional and sexual abuse remained significant for most outcomes. Witnessing family violence and living with a mentally ill household member also emerged as significant predictors.

Another logistic regression examined associations between cumulative trauma and mental health outcomes using trauma counts from CTQ-SF (CTQ-5), overlapping ACE-IQ categories (ACE-5), and full ACE-IQ (ACE-13) (Table 5). The ACE-13 model demonstrated slightly better fit across outcomes than CTQ-5 than ACE-5 models based on  $R^2$ , AIC, and BIC. Each additional trauma in CTQ-SF models corresponded to a 2.1–2.5 times increased risk, while each additional trauma in ACE-IQ models corresponded to a 1.7 times increased risk. Overall, the results demonstrated a dose-response relationship between cumulative trauma and poorer mental health outcomes, with the full ACE-IQ measure better capturing cumulative trauma risk compared to just the overlapping categories with CTQ-SF.

### 5. Discussion

This study undertook a comprehensive evaluation of two widely used international childhood maltreatment retrospective screening measures from multiple aspects, including the internal consistency, the correlation and prevalence of overlapping categories, and the predictive efficacy of the two models for various trauma-related outcomes. Regarding the research questions outlined in the introduction, first, on which the ACE-IQ cutoff score displays greater consistency with the CTQ-SF, the study proposed a scoring methodology for ACE-IQ that enhances the comparability of the two measures. Second, on cross-tool consistency in predicting

**Table 2**  
Summary of the demography and prevalence of trauma-related disorders.

Variables	Percent ( $N = 1484$ )
Age (Mean year $\pm$ SD)	19.5 $\pm$ 1.58
Sex (male/female)	18.5 % / 81.5 %
BMI (Mean $\pm$ SD)	21.4 $\pm$ 3.64
Family income (RMB/month)	
<1000	2.63 %
1000–5000	27.90 %
5000–10,000	36.93 %
10,000–30,000	24.26 %
30,000–50,000	5.40 %
>50,000	2.90 %
Parent education	
Father	
Primary education or less	11.10 %
Junior education	35.22 %
High school	25.76 %
Junior College	13.82 %
Undergraduate	12.14 %
Graduate	1.96 %
Mother	
Primary education or less	16.67 %
Junior education	33.33 %
High school	23.82 %
Junior College	14.78 %
Undergraduate	10.19 %
Graduate	1.21 %
PTSD prevalence rates	6.7 %
CPTSD prevalence rates	1.5 %
BPD prevalence rates	18.1 %
Anxiety prevalence rates	22.6 %
Depression prevalence rates	10.8 %

**Table 3**  
Correlation analysis from ACE-IQ and CTQ-SF overlapping ACEs categories.

CTQ-SF (Prevalence%)	ACE-IQ		Pearson $\chi^2$		Cramer's V
		Prevalence%	Value	P	
EN (11.59)	EN (most of the time)	94.41	5.458	0.019*	0.061
	EN (rarely or never) <sup>a</sup>	35.04	121.05	0.00***	0.286
	<b>EN (never)</b>	<b>9.64</b>	<b>142.42</b>	<b>0.00***</b>	<b>0.310</b>
EA (3.91)	EA (once)	41.71	61.24	0.00***	0.203
	EA (a few time)	35.51	67.74	0.00***	0.214
	<b>EA (many time)<sup>a</sup></b>	<b>8.29</b>	<b>229.67</b>	<b>0.00***</b>	<b>0.393</b>
PN (14.15)	<b>PN (once)</b>	<b>14.29</b>	<b>168.56</b>	<b>0.00***</b>	<b>0.337</b>
	PN (a few time)	8.96	138.673	0.00**	0.306
	PN (many time) <sup>a</sup>	1.95	6.94	0.008**	0.068
PA (1.82)	PA (once)	32.21	45.92	0.00***	0.176
	PA (a few time)	24.73	60.81	0.00***	0.202
	<b>PA (many time)<sup>a</sup></b>	<b>5.26</b>	<b>234.14</b>	<b>0.00***</b>	<b>0.397</b>
SA (5.46)	<b>SA (once)<sup>a</sup></b>	<b>13.48</b>	<b>280.90</b>	<b>0.00***</b>	<b>0.438</b>

Note. EN = emotional neglect; EA = emotional abuse; PN = physical neglect; PA = physical abuse; SA = sexual abuse; Cramer's V indicated the strength of association between ACE-IQ and CTQ-SF; prevalence = percentage of participants who experienced that category.

The bold font indicating the best consistency in scoring methods.

<sup>a</sup> ACE-IQ frequency scoring method from WHO Guidance for Analyzing ACE-IQ.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

outcomes, it was observed that different tools identified varying trauma types, leading to inconsistent associations with trauma-related outcomes. Finally, on whether the 13-category ACE-IQ model exhibits superior predictive validity compared to the 5-category model, the 13-category ACE-IQ model exhibited slightly superior explanatory power compared to the 5-category model. The broader range of adversities assessed by the ACE-IQ provides greater sensitivity in characterizing trauma burden.

Even if the same instruments are selected, the different cut-off criteria yield different results. Using the same instruments (CTQ-SF) and the cut-off criterion ("moderate" to "severe"), Chen and colleagues reported similar prevalence results in a large Chinese-college-student sample which were EN (7.5 %), EA (2.7 %), PN (14.9 %), PA (2.4 %), and SA (3.0 %) (Chen et al., 2021). In this study, the prevalence calculated from the original guidance was overestimated in the categories of neglect (EN and PN), which was consistent with the studies of others (Ho et al., 2019; Kim, 2017), and after the correction, it was close to the prevalence of the CTQ-SF. In the categories of abuse (EA and PA), the prevalence was slightly higher than the results from CTQ-SF, in which the corresponding cutoff score had reached the floor effect and was the same as the original method. According to the definition of contact SA in ACE-IQ and taking account of the realistic scenario, we adopted the original method for the categories in SA. Collectively, the prevalence in neglect categories was similar between ACE-IQ and CTQ-SF after modification, and the prevalence in abuse categories was slightly higher in ACE-IQ than CTQ-SF (Quinn et al., 2018).

The operational definition of child maltreatment plays a crucial role in understanding its association with adverse health outcomes. Numerous studies have attempted to establish specific connections between different forms of trauma and their corresponding outcomes (Infurna et al., 2016; Lindert et al., 2014). One possible explanation for the inconsistent findings is the use of different assessment instruments, as evidenced by the present study. Specifically, the investigation demonstrated that identical forms of trauma, assessed using different questionnaires, did not consistently predict the outcomes. In the CTQ-SF, the emotional abuse category emerged as a stable risk factor for all the trauma-related disorders examined in this study, resulting in a four to six-fold increase in the likelihood of developing these disorders. On the other hand, in ACE-IQ, exposure to domestic violence was associated with a 2–5 times increased risk of these disorders. For the aforementioned incongruity is that child maltreatment is not a solitary occurrence, but rather interconnected, and that individuals may be subjected to multiple forms of maltreatment simultaneously (Dong et al., 2004; Lacey et al., 2020). Considering the dose-response relationship between adverse childhood experiences (ACEs) and negative outcomes (Felitti et al., 1998), it is crucial for assessment instruments to cover a wide range of traumatic events that children may have encountered. Although ACE-IQ provides a more comprehensive assessment, it overlooks specific forms of maltreatment that are culturally and environmentally specific, such as religious persecution, child marriage, child labor, and the experiences of left-behind children. Therefore, modifications are required to ensure the cultural appropriateness of ACE-IQ.

This study represents the first comprehensive comparison of the CTQ-SF and ACE-IQ, offering valuable insights into their consistency. The analysis contributes to understanding childhood maltreatment assessment and provides a benchmark for selecting ACE-IQ frequency ratings to enable cross-study comparisons. Researchers can make informed choices between the tools based on objectives: the 13-category ACE-IQ excels in assessing a broad range of trauma and cumulative burden, while the 5-category CTQ-SF is particularly adept for more focused investigations. Our findings demonstrate the importance of tailoring measurement to research questions by considering each tool's characteristics and capacity to capture relevant trauma types. In particular, the ACE-IQ's more comprehensive trauma assessment better characterizes cumulative impact on mental health. Researchers should weigh the advantages of each instrument for their specific context to optimize trauma measurement. Overall, this study offers practical guidance on selecting appropriate childhood maltreatment measures based on research aims.



**Table 4**

Two child maltreatment model coefficients predict PTSD, CPTSD, BPD, anxiety, and depression.

	PTSD (N = 1484)		CPTSD (N = 1484)		BPD (N = 1477)		Anxiety (N = 1466)		Depression (N = 1466)	
	OR (95 % CI)	p	OR (95 % CI)	p	OR (95 % CI)	p	OR (95 % CI)	p	OR (95 % CI)	p
<b>Model 1</b>										
Emotional neglect	1.54 (0.85–2.80)	0.154	<b>4.34</b> (1.52–12.40)	<b>0.006**</b>	<b>2.34</b> (1.55–3.53)	<b>0.000***</b>	<b>1.92</b> (1.30–2.84)	<b>0.001**</b>	<b>1.90</b> (1.17–3.08)	<b>0.009**</b>
Emotional abuse	<b>6.71</b> (3.35–13.47)	<b>0.001***</b>	<b>4.21</b> (1.30–13.68)	<b>0.017*</b>	<b>4.35</b> (2.26–8.35)	<b>0.000***</b>	<b>3.56</b> (1.91–6.64)	<b>0.000***</b>	<b>4.95</b> (2.58–9.50)	<b>0.000***</b>
Physical neglect	<b>2.28</b> (1.33–3.90)	<b>0.003***</b>	1.76 (0.62–5.00)	0.287	<b>2.22</b> (1.52–3.23)	<b>0.000***</b>	<b>1.96</b> (1.38–2.80)	<b>0.000***</b>	<b>2.32</b> (1.50–3.61)	<b>0.000***</b>
Physical abuse	0.72 (0.24–2.20)	0.564	0.25 (0.03–2.39)	0.227	0.51 (0.18–1.40)	0.191	0.81 (0.32–2.90)	0.666	0.67 (0.24–1.90)	0.449
Sexual abuse	<b>2.33</b> (1.19–4.56)	<b>0.014***</b>	1.67 (0.47–5.97)	0.430	<b>4.65</b> (2.76–7.80)	<b>0.000***</b>	<b>1.95</b> (1.16–3.26)	<b>0.012*</b>	<b>2.44</b> (1.36–4.41)	<b>0.003**</b>
<b>Model 2</b>										
Emotional neglect	1.31 (0.69–2.49)	0.416	2.24 (0.74–6.834)	0.156	1.51 (0.98–2.34)	0.067	1.23 (0.81–1.86)	0.332	<b>1.89</b> (1.15–3.08)	<b>0.011*</b>
Emotional abuse	<b>2.55</b> (1.32–4.93)	<b>0.006**</b>	0.89 (0.21–3.85)	0.878	<b>2.20</b> (1.31–3.70)	<b>0.003**</b>	<b>1.95</b> (1.18–3.24)	<b>0.010*</b>	1.72 (0.94–3.15)	0.081
Physical neglect	1.42 (0.83–2.42)	0.203	0.63 (0.19–2.08)	0.449	1.23 (0.83–1.80)	0.300	1.18 (0.82–1.68)	0.375	<b>1.87</b> (1.22–2.86)	<b>0.004**</b>
Physical abuse	1.01 (0.45–2.25)	0.986	1.03 (0.20–5.30)	0.976	1.58 (0.85–2.97)	0.152	1.20 (0.65–2.23)	0.555	0.86 (0.41–1.80)	0.688
Sexual abuse	<b>2.20</b> (1.32–3.65)	<b>0.002*</b>	1.41 (0.49–4.04)	0.525	<b>2.83</b> (1.98–4.03)	<b>0.000***</b>	<b>1.99</b> (1.41–2.81)	<b>0.000***</b>	1.48 (0.94–2.32)	0.089
Living with a substance abuser	1.09 (0.45–2.61)	0.854	1.188 (0.279–5.053)	0.816	0.96 (0.49–1.90)	0.910	1.55 (0.85–2.818)	0.152	1.45 (0.71–2.93)	0.308
Living with a household member who was mentally ill or suicidal	<b>2.19</b> (1.17–4.11)	<b>0.015*</b>	<b>6.06</b> (2.12–17.33)	<b>0.001**</b>	1.40 (0.85–2.30)	0.188	<b>1.79</b> (1.13–2.83)	<b>0.013*</b>	<b>2.00</b> (1.16–3.45)	<b>0.012*</b>
Living with a household member who was imprisoned	1.25 (0.45–3.50)	0.666	2.73 (0.66–11.30)	0.165	<b>2.39</b> (1.13–5.03)	<b>0.022*</b>	1.14 (0.54–2.40)	0.726	1.56 (0.67–3.67)	0.307
Parental death or separation or divorce	0.79 (0.45–1.42)	0.435	2.04 (0.76–5.51)	0.158	1.37 (0.95–1.97)	0.096	1.40 (1.00–1.96)	0.052	1.44 (0.93–2.21)	0.100
Witnessed family violence	<b>3.36</b> (2.04–5.53)	<b>0.001***</b>	<b>4.98</b> (1.81–13.70)	<b>0.002*</b>	<b>1.73</b> (1.18–2.53)	<b>0.005**</b>	<b>1.73</b> (1.21–2.48)	<b>0.002**</b>	<b>2.77</b> (1.81–4.23)	<b>0.000***</b>
Bullying	1.79 (0.48–6.76)	0.389	2.60 (0.22–31.33)	0.451	<b>3.16</b> (1.03–9.65)	<b>0.044*</b>	2.91 (1.00–8.52)	0.051	2.51 (0.79–8.03)	0.120
Domestic violence	1.35 (0.58–3.14)	0.494	1.60 (0.33–7.66)	0.556	<b>1.95</b> (1.02–3.74)	<b>0.045*</b>	1.51 (0.81–2.84)	0.199	1.66 (0.80–3.45)	0.177
Community violence	1.16 (0.35–3.84)	0.814	0.28 (0.02–3.38)	0.314	0.94 (0.37–2.40)	0.888	<b>2.42</b> (1.08–5.41)	<b>0.032*</b>	1.78 (0.67–4.72)	0.246

Note: R<sup>2</sup> is Nagelkerke.

Bold indicates statistical significance.

\*  $p < 0.05$ .\*\*  $p < 0.01$ .\*\*\*  $p < 0.001$ .

**Table 5**  
Model comparison of cumulative trauma predicting trauma-related outcomes.

		R <sup>2</sup>	AIC	BIC	OR (95 % CI)
PTSD	CTQ-5	0.125	662	673	2.22 (1.86–2.64)**
	ACE-5	0.113	670	680	2.24 (1.86–2.68)**
	<b>ACE-13</b>	<b>0.144</b>	<b>651</b>	<b>661</b>	<b>1.68 (1.51–1.87)**</b>
CPTSD	CTQ-5	0.096	212	223	2.10 (1.59–2.77)**
	ACE-5	0.065	219	230	2.03 (1.46–2.84)**
	<b>ACE-13</b>	<b>0.152</b>	<b>200</b>	<b>211</b>	<b>1.72 (1.45–2.03)**</b>
BPD	CTQ-5	0.149	1259	1270	2.45 (2.09–2.87)**
	ACE-5	0.136	1272	1283	2.33 (2.00–2.71)**
	<b>ACE-13</b>	<b>0.158</b>	<b>1250</b>	<b>1261</b>	<b>1.71 (1.56–1.88)**</b>
Anxiety	CTQ-5	0.090	1483	1494	1.97 (1.70–2.29)**
	ACE-5	0.081	1493	1503	1.89 (1.64–2.18)**
	<b>ACE-13</b>	<b>0.120</b>	<b>1452</b>	<b>1463</b>	<b>1.59 (1.45–1.73)**</b>
Depression	CTQ-5	0.126	912	923	2.22 (1.89–2.61)**
	ACE-5	0.096	935	946	2.06 (1.75–2.42)**
	<b>ACE-13</b>	<b>0.155</b>	<b>889</b>	<b>900</b>	<b>1.70 (1.54–1.88)**</b>

Note: R<sup>2</sup> is Nagelkerke. AIC = Akaike information criterion; BIC = Bayesian information criterion. Lower AIC, BIC, and deviance indicate better fit. Best fitting model (by AIC and BIC) is bolded.

\*\*  $p < 0.01$ .

This study has a significant limitation: our sample was primarily composed of young adults and skewed toward females. This gender and age bias may impact the generalizability of our findings, as it may not accurately represent the experiences of males and a broader population. Future research should aim for more diverse and representative samples to enhance the validity and generalizability of conclusions.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106529>.

### Declaration of competing interest

The authors declare they have no conflict of interest.

### Data availability

Data will be made available on request.

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