



# Latent class analysis of post-traumatic stress symptoms and complex PTSD in child victims of sexual abuse and their response to Trauma-Focused Cognitive Behavioural Therapy

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## ABSTRACT

**Background:** PTSD symptoms are frequent in child victims of sexual abuse. Yet, authors have argued that early trauma could lead to alterations in development that go far beyond the primary symptoms of PTSD and have proposed Complex PTSD as an alternative diagnosis encompassing difficulties in affect regulation, relationships and self-concept.

**Objective:** To delineate profiles in child victims of sexual abuse and explore whether profiles are associated with treatment response to Trauma-Focused Cognitive Behavioural Therapy.

**Method:** Latent class analysis was used to identify symptom profiles at baseline assessment of 384 children ages 6 to 14, recruited in a Child Advocacy Centre following disclosure of sexual abuse. Dimensions of Complex PTSD diagnosis as proposed by the ICD-11 were derived from self-report questionnaires.

**Results:** Latent class analysis identified a best fitting model of three classes: Classic PTSD regrouping 51% of children, Complex PTSD describing 23% of children, and Resilient describing 25% of children. Trauma-focused therapy was associated with a significant reduction of dissociation, internalizing, and externalizing problems for children of all three classes. Trauma-focused therapy was also linked to a significant reduction of PTSD symptoms with larger effect size ( $d = .90$ ; 95%CI: 0.63–1.16) for children classified in the Complex PTSD class.

**Conclusion:** These findings highlight the utility of a person-oriented approach to enhance our understanding of the diversity of profiles in child victims. The results offer empirical support for the ICD-11 PTSD and Complex PTSD distinction in a clinical sample of sexually abused children and the relevance of this distinction in foreseeing treatment outcomes.

## Análisis de clase latente de síntomas de estrés postraumático y TEPT complejo en víctimas de abuso sexual infantil y sus respuesta a terapia cognitivo conductual centrada en el trauma

**Antecedentes:** Los síntomas de TEPT son frecuentes en niños víctimas de abuso sexual. Sin embargo, los autores han argumentado que el trauma temprano podría llevar a alteraciones en el desarrollo que van más allá de los síntomas primarios de TEPT y han propuesto el TEPT Complejo como una alternativa diagnóstica que abarca las dificultades en la regulación de los afectos, las relaciones interpersonales y el autoconcepto.

**Objetivo:** Delinear perfiles en niños víctimas de abuso sexual y explorar si los perfiles están asociados con respuesta al tratamiento de Terapia Cognitivo Conductual Centrada en el Trauma.

**Método:** Se utilizó análisis de clase latente para identificar perfiles de síntomas en la evaluación inicial de 384 niños, edades entre 6 a 14 años, reclutados en el Centro de Defensa Infantil luego de la revelación del abuso sexual. Las dimensiones diagnósticas de TEPT Complejo según lo propuesto por la CIE-11 se derivaron de cuestionarios de auto-reporte.

**Resultados:** El análisis de clase latente identificó el mejor modelo de tres clases: TEPT Clásico reagrupó al 51% de los niños, TEPT Complejo describió al 23% de los niños, y Resiliente describió al 25% de los niños. La terapia centrada en el trauma se asoció con una reducción significativa de disociación, y problemas internalizantes y externalizantes de los niños de las tres clases. La terapia centrada en el trauma también se vinculó con una reducción significativa de síntomas de TEPT con un mayor tamaño de efecto ( $d = .90$ ; 95% IC: 0.63–1.16) para los niños clasificados en el grupo de TEPT Complejo.

**Conclusiones:** Los hallazgos resaltan la utilidad de un enfoque orientado a la persona para mejorar nuestra comprensión de la diversidad de perfiles en niños víctimas. Los resultados ofrecen apoyo empírico para la distinción en la CIE-11 de TEPT y TEPT Complejo en una muestra clínica de niños abusados sexualmente y la relevancia de esta distinción para prever los resultados del tratamiento.

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## PALABRAS CLAVE

Abuso sexual infantil; Trastorno de Estrés Postraumático; TEPT Complejo; Terapia Cognitivo Conductual; Diagnóstico

## 关键词

儿童性虐待; 创伤后应激障碍; 复杂性PTSD; 认知行为疗法; 诊断

## HIGHLIGHTS

- This study reveals three subgroups of child victims of sexual abuse: resilient children, children displaying PTSD and children showing Complex PTSD symptoms.
- Trauma-focused cognitive behavioural therapy was found to be effective in sustaining recovery for all subgroups.

## 性虐待儿童受害者创伤后应激障碍症状和复杂性PTSD的潜在类别分析及其对聚焦创伤认知行为疗法的反应

背景: PTSD症状在性虐待的儿童受害者中很常见。然而, 作者认为早年创伤可能导致发展变化远超PTSD的主要症状, 并提出了复杂性PTSD作为替代诊断, 包括情感调节, 关系和自我概念方面的困难。

目的: 描绘性虐待儿童受害者的剖面, 探讨剖面是否与聚焦创伤认知行为疗法的治疗反应相关。

方法: 采用潜在类别分析法, 针对384名招募于发现被性虐待后进入儿童权益保护中心的6至14岁的儿童, 确定其基线评估的剖面。ICD-11提出的复杂性PTSD诊断维度来自自我报告问卷。

结果: 潜在类别分析确定了三个类别的最佳拟合模型: 经典PTSD组有51%的儿童, 复杂性PTSD组有23%的儿童, 韧性组有25%的儿童。聚焦创伤疗法与三类儿童的解离, 内化和外化问题的显著减少均相关。聚焦创伤为疗法也与复杂性PTSD组儿童的PTSD症状的显著降低相关, 且具有更大的效应量 ( $d = .90$ ; 95%CI:  $0.63 - 1.16$ )。

结论: 研究结果强调了以人为本的方法有助于增进我们对儿童受害者多种剖面的了解。结果为性虐待儿童的临床样本中ICD-11 PTSD和复杂性PTSD的区别以及这种区别在预测治疗结果方面的相关性提供了实证支持。

**Abbreviations:** PTSD: post-traumatic stress disorder; ICD: international classification of diseases.

Post-traumatic stress disorder (PTSD) symptoms are prevalent in child victims of sexual abuse (Nooner et al., 2012). Yet, authors have argued that early trauma could lead to alterations in development that go far beyond the core symptoms of PTSD (Ford, 2015). The World Health Organization in its last edition of the International Classification of Diseases (ICD), has proposed the Complex PTSD (C-PTSD) as an alternative diagnosis encompassing difficulties in affect regulation, relationships and self-concept (ICD-11) (World Health Organization, 2018). Studies that have assessed the relevance of C-PTSD, have supported the distinction between the two disorders (Brewin et al., 2017). However, these studies were conducted mainly with adult samples and few studies have explored the value of these constructs among samples of children (Kazlaushas et al., 2020). Consequently, further research is needed to explore whether these two diagnoses are indeed distinct in child victims given this distinction could efficiently orient service provision.

Trauma-focused cognitive-behavioural therapy (TF-CBT) is recognized as the gold standard for the treatment of PTSD symptoms in child victims of sexual abuse (Runyon, Risch, & Deblinger, 2019). Although TF-CBT have been shown to improve PTSD symptoms, little is known about its effect on Complex PTSD symptoms among children. Sachser, Keller, and Goldbeck (2016) have investigated the effects of TF-CBT in a sample of children and adolescents from German mental health clinics, who had sustained a traumatic event and presented PTSD symptoms. They first identified two distinct classes of symptom profiles and found that TF-CBT was associated to a large effect size for PTSD symptoms in both classes and medium to large effect size for symptoms characteristics of C-PTSD among the

C-PTSD group. Although their study is a first step in understanding C-PTSD in children and its treatment, their study included a small number of children who completed treatment ( $n = 38$  in the PTSD class and  $n = 23$  in the C-PTSD). In addition, the age range of the participants was quite large and included both school-aged children and adolescents, which could mask some important developmental specificities in symptom profiles. Their sample also included children faced with a variety of traumas (sexual abuse, physical abuse, loss of a close friend or relative) and it is known that not all traumas are associated with the same effects. For instance, child victims of sexual abuse are found to present greater internalizing and externalizing behaviour problems over time compared to maltreated but non-sexually abused children (Lewis, McElroy, Harlaar, & Runyan, 2016). Given child sexual abuse is a more intrusive type of trauma that involves specific interpersonal dynamics (Finkelhor & Browne, 1985), it is important to document whether C-PTSD can be accurately assessed in this population and to explore the effects of TF-CBT among sexually abused children presenting with more complex symptomatology. Against this backdrop, the current study aimed 1) to disentangle the diversity of symptom profiles in child victims of sexual abuse based on the ICD-11 C-PTSD model and 2) examine whether profiles are associated with treatment response to TF-CBT. Since TF-CBT is a flexible therapeutic approach, the results will allow for cues to a more personalized approach to treatment for this vulnerable population of youth. Documentation of symptom profiles in populations confronted to trauma in other countries would also contribute to support the validity of the PTSD/C-PTSD distinction (Cloitre, 2020).

## 1. Method

### 1.1. Participants and procedure

The sample involved 384 children ages 6 to 14 (67.2% girls; Mean age: 9.56, *SD*: 2.11) seeking services following disclosure of sexual abuse in a Child advocacy centre in Montreal, Quebec, Canada. Inclusion criteria for the study were that the child disclosed sexual abuse and that the case was substantiated by Child Protective Services. In addition, children ages 6 to 14 years old had to be referred for services at the Child Advocacy Centre, be accompanied by a non-offending caregiver and speak English or French. Exclusion criteria were child who do not speak English or French, or presented significant developmental delays making them incapable of completing the measures.

The majority of children reported experiencing intra-familial sexual abuse (69.9%) or abuse involving a known aggressor (28.5%). Only a minority of cases involved a stranger as the perpetrator (1.6%). Most cases (66.2%) involved severe acts of abuse (penetration or attempted penetration), while (27.4%) consisted of unclothed touching and (6.4%) clothed touching. Children reported chronic abuse (38.5%) lasting more than 6 months.

At their initial visit to the centre, non-offending parents were invited to participate in the study. Trained research assistants explained the purpose of the study and the procedures which involved completion of questionnaires before the therapy (pretreatment) and after the end of therapy (posttreatment). Participants were informed that they could refuse to participate in the study without impacting the services provided by the centre. Written informed consent was obtained from all parents and verbal consent was obtained from all children. Verbal consent was witnessed and formally recorded. Children and the participating parents were directed to separate rooms to complete the questionnaire with the help of a research assistant. All procedures involving human patients were approved by the institutional ethic boards of Ste-Justine Hospital and Université du Québec à Montréal. The initial assessment (pretreatment) took place before the first session of TF-CBT and the second assessment (posttreatment) after the last therapy session.

### 1.2. Measures

#### 1.2.1. Socio-demographic and abuse characteristics

A sociodemographic questionnaire was completed by parents assessing socio-demographic information (age and sex of the child, family structure). Characteristics of the sexual abuse experienced

(identity of the perpetrator, sexual acts involved, duration) were assessed by an adapted version (Hébert & Cyr, 2010) of the History of Victimization Form (Wolfe, Gentile, & Bourdeau, 1987), completed by the clinicians. Analysis of inter-rater reliabilities based on the coding of 30 records indicated high agreement inter-rater reliability with a median intraclass correlation of .86 and a median inter-rater agreement of 92.8% (Hébert, Tremblay, Parent, Daignault, & Piché, 2006).

To reach our first objective, the following measures were used to derive the PTSD and C-PTSD symptoms as specified for ICD-11.

#### 1.2.2. PTSD

The PTSD subscale of the Children's Impact of Traumatic Events Scale II (CITES II; Wolfe, 2002) was administered. This instrument assesses the severity of post-traumatic stress symptoms reported by children with items evaluated on a 3-point scale, ranging from 0 (false) to 2 (very true). For the latent class analysis, items from each of the three criteria of Re-Experiencing, Avoidance, and Hypervigilance, were used and a dichotomic score was derived where endorsing 'very true' to at least one item was considered symptom positive.

#### 1.2.3. C-PTSD

Three sets of indicators of disturbances in self-organization were considered as per the ICD-11 diagnostics. Items were selected as they were judged directly or closely representative of the symptoms as proposed in the ICD-11.

For affect dysregulation, items from the CITES II reflecting anger and irritability (for e.g. 'I get upset over little things') were used and dichotomized with a score of 1, reflecting the presence of at least one manifestation of anger or irritability. One item from the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978) was used to assess hurt feelings ('My feelings get hurt easily'). For persistent beliefs of feeling worthless, one item ('Other kids are often not happy with themselves') was derived from the Self-Perception Profile for Children (Harter, 1985). Items from the CITES II were used to assess feelings of guilt related to the traumatic event (for e.g. 'I feel like I was to blame for what happened'). Finally, for persistent difficulties in interpersonal relationships, items reflecting loneliness ('I feel alone all the time') from the Children's Depression Inventory (Kovacs, 1992) and reflecting feeling detached from others from the CITES II (for e.g. 'I did not feel like playing or hanging out with other kids') were dichotomized.

To address our second objective, the following outcome measures were used.

#### 1.2.4. PTSD

The total score (ranging from 0 to 92) of the PTSD subscale of the CITES II, described above was used. The internal consistency of the total PTSD score in this study was high ( $\alpha = .94$ ).

#### 1.2.5. Dissociation

Parents completed the Child Dissociative Checklist (Putnam, Helmers, & Trickett, 1993) to assess children's dissociation symptoms. This questionnaire is composed of 20 questions assessed on a 3-point scale (0 not true; 2 very true). Total scores range from 0 to 40. The internal consistency of the score in this study was high ( $\alpha = .82$ ).

#### 1.2.6. Behaviour problems

Two subscales of the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001) were completed by the parent to assess the child's behaviour problems: the internalizing behaviour subscale (which includes symptoms such as anxiety, withdrawal and somatic problems) and the externalizing behaviours subscale (which evaluates rule-breaking and aggressive behaviours). For both subscales, a *T* score was derived. The internal consistency was high for both scores ( $\alpha = .86$  for internalizing behaviour problems and  $.92$  for externalizing behaviour problems).

## 2. Data analytic plan

Missing data analysis indicated that less than 1% of the data were missing. No pattern of missing data could be identified ( $\chi^2 = 31.35$ ,  $df = 32$ ,  $p = .49$ ), therefore missing data was estimated using Full information maximum likelihood (FIML) (Enders, 2001) in further analyses.

To achieve our first objective, a Latent Class Analysis (LCA) was conducted using *Mplus 8*. This method is used to identify subgroups in a heterogeneous population, using robust standard errors that account for non-normality of the data (Lanza & Cooper, 2016). Different number of classes were tested subsequently to identify the optimal class solution and the following criteria were used to choose the optimal class solution (Lanza & Cooper, 2016). First, to compare the different class solutions, the Akaike Information Criterion (AIC) (Akaike, 1987), the Bayesian Information Criterion (BIC) (Schwarz, 1978), and the adjusted Bayesian Information Criterion (aBIC) (Sclove, 1987) were used; lower values indicate a better fitting class solution.

Then, the entropy value was used to ensure the differentiation between classes, the closer the entropy is to one, the better the class differentiate. The Bootstrapped Likelihood ratio test (BLRT) was used to ensure the parsimony of the model. A significant (BLRT) indicates that a class solution is a better fit than the  $n-1$  model (Lo, Mendell, & Rubin, 2001). Last, the class solution has to be interpretable. In order to ascertain the distinctive features of each class, a series of chi-square analyses were conducted using SPSS 25. Then, pairwise comparisons of column proportions using the Bonferroni correction, which adjusts the observed significance level for the fact that multiple comparisons are made, were conducted.

For our second objective, analyses were conducted with children who participated in TF-CBT. This therapy includes individual sessions as well as dyadic sessions with the child and the non-offending parent. TF-CBT includes eight components which spell out the acronym PRACTICE: Psychoeducation and parenting skills, Relaxation techniques, Affective expression and regulation, Cognitive coping, Trauma narrative, In vivo gradual exposure, Conjoint parent-child sessions, and Enhancing safety (Cohen, Mannarino, & Deblinger, 2017).

Of the 384 children who participated in the initial assessment, 20 (5.20%) were not referred to TF-CBT or did not start treatment, 2 (0.52%) completed less than 3 sessions of treatment and posttreatment assessment was not available for 36 cases (9.38%). The analyses were thus performed with a sample of 326 children who completed the treatment and for whom posttreatment data were available. Pairwise *t*-tests were performed to assess changes in symptomatology for each class following TF-CBT. The main outcomes considered were internalizing and externalizing behaviours problems, PTSD, and dissociation. To explore whether TF-CBT was effective in treating C-PTSD symptoms, pairwise *t*-tests were conducted for children assigned to the C-PTSD class. Effect sizes were computed using Cohen's *d* (Cohen, 1977) to evaluate the magnitude of changes between pretreatment and posttreatment scores.

## 3. Results

### 3.1. Identifying latent classes and interpretation of the three-class solution

Two to five class solutions were tested. Considering the different fit indices, the entropy value, model

**Table 1.** Latent class models and fit indices ( $n = 384$ ).

Model	Log-likelihood	Number of parameters	AIC	BIC	Entropy	LMRA-LRT $p$ -value	BLRT $p$ -value	Size
2 classes	- 2 489.179	25	5 028.358	5 127.124	.780	.0000	.0000	209   175
<b>3 classes</b>	<b>- 2 444.622</b>	<b>38</b>	<b>4 965.244</b>	<b>5 115.368</b>	<b>.746</b>	<b>.0038</b>	<b>.0041</b>	<b>90   199   95</b>
4 classes	- 2 414.650	51	4 931.300	5 132.783	.735	.0565	.0589	84   82   170   48

Note: AIC, Akaike information criterion; BIC, Bayesian information criterion; LMRA-LRT, Lo-Mendell-Rubin adjusted likelihood ratio test; BLRT, bootstrap likelihood ratio test. The best fitting model is identified by bold values.



parsimony as well as interpretability, the three-class solution was found to be the optimal class solution. Model fit for class solutions are presented in Table 1.

The latent class analysis identified three distinct classes which were named *Complex PTSD*, *Classic PTSD*, and *Resilient*. The expected probabilities of endorsing symptoms within each class are detailed in Table 2 and illustrated in Figure 1.

The *Complex PTSD* class was characterized by high probabilities of symptom endorsement for all indicators considered and describes 23.44% of the sample. Children in this class reported high probabilities of meeting the diagnostic criteria for PTSD as well as for disturbances in self-organization symptom

clusters including affect dysregulation, negative self-concept and interpersonal problems.

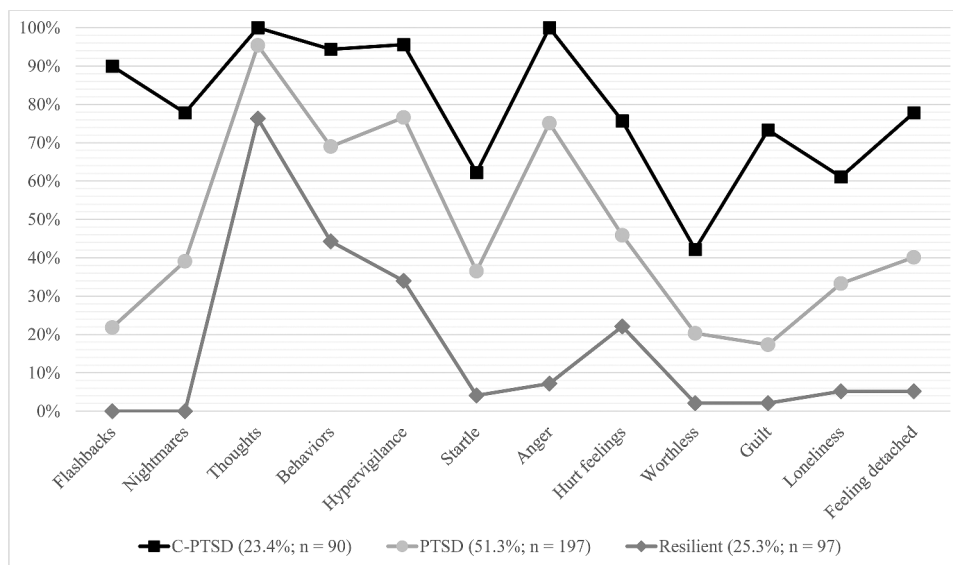
The *Classic PTSD* class was the largest class, comprising 51.30% of the sample. Children in this class showed moderate (22–39%) to high (69–95%) probabilities of endorsing indicators reflecting PTSD and generally lower probabilities of endorsing symptom clusters reflecting C-PTSD although a very high percentage of children endorsed indicators of anger.

The *Resilient* class represented 25.26% of the sample and describes a profile where children present with low probability of symptom endorsement for PTSD symptoms save for avoidance of thoughts and behaviours reminders of the trauma event. In addition, children

**Table 2.** Probability of endorsement of PTSD and C-PTSD symptoms for each class (n = 384).

	Total n = 384	C-PTSD n = 90	PTSD n = 197	Resilient n = 97	Statistic test
<b>PTSD</b>					
<b>Re-experiencing</b>					
Flashbacks	32.3%	90.0% <sub>a</sub>	21.8% <sub>b</sub>	0.0% <sub>c</sub>	$\chi^2(2) = 193.21$ ***
Nightmares	38.3%	77.8% <sub>a</sub>	39.1% <sub>b</sub>	0.0% <sub>c</sub>	$\chi^2(2) = 119.64$ ***
<b>Avoidance</b>					
Thoughts	91.7%	100.0% <sub>a</sub>	95.4% <sub>a</sub>	76.3% <sub>b</sub>	$\chi^2(2) = 41.87$ ***
Behaviours	68.8%	94.4% <sub>a</sub>	69.0% <sub>b</sub>	44.3% <sub>c</sub>	$\chi^2(2) = 54.59$ ***
<b>Sense of threat</b>					
Hypervigilance	70.3%	95.6% <sub>a</sub>	76.6% <sub>b</sub>	34.0% <sub>c</sub>	$\chi^2(2) = 92.47$ ***
Startle	34.4%	62.2% <sub>a</sub>	36.5% <sub>b</sub>	4.1% <sub>c</sub>	$\chi^2(2) = 70.70$ ***
<b>C-PTSD</b>					
<b>Affect dysregulation</b>					
Anger	63.8%	100.0% <sub>a</sub>	75.1% <sub>b</sub>	7.2% <sub>c</sub>	$\chi^2(2) = 196.48$ ***
Hurt feelings	47.2%	76.7% <sub>a</sub>	45.9% <sub>b</sub>	22.1% <sub>c</sub>	$\chi^2(2) = 55.49$ ***
<b>Negative self-concept</b>					
Worthless	20.8%	42.2% <sub>a</sub>	20.3% <sub>b</sub>	2.1% <sub>c</sub>	$\chi^2(2) = 45.72$ ***
Guilt	26.6%	73.3% <sub>a</sub>	17.3% <sub>b</sub>	2.1% <sub>c</sub>	$\chi^2(2) = 139.52$ ***
<b>Interpersonal problems</b>					
Loneliness	32.8%	61.1% <sub>a</sub>	33.3% <sub>b</sub>	5.2% <sub>c</sub>	$\chi^2(2) = 65.90$ ***
Feeling detached	40.1%	77.8% <sub>a</sub>	40.1% <sub>b</sub>	5.2% <sub>c</sub>	$\chi^2(2) = 102.50$ ***

Note: \*\*\*p < .001, PTSD, Post-traumatic stress disorders; C-PTSD, Complex post-traumatic stress disorder. Cells with differing subscripts are statistically different from one another.



**Figure 1.** Expected probability of endorsement of symptoms in the three-class model (n = 384).

Note: PTSD, Post-traumatic stress disorders; C-PTSD, Complex post-traumatic stress disorder.

in this class showed very low probability of meeting the diagnostic criteria for C-PTSD referring to affect dysregulation, negative self-concept, and difficulties in interpersonal relationships.

The results of Chi-square analyses revealed overall significant differences between the three classes for all indicators. Subsequent paired comparisons revealed a gradient effect for all indicators but one. Thus, children in the *Complex PTSD* class had the highest probabilities of symptom endorsement, and children in the *Resilient* class had the lowest probabilities of symptom endorsement for indicators, and children in the *Classic PTSD* class, were situated between the two other classes. The only exception was found for avoidance of thoughts for which the paired comparison revealed that children in the *Resilient* class presented a lower probability of symptom endorsement, but this indicator did not differentiate children from the *Complex PTSD* and *Classic PTSD* class.

The three classes did not differ regarding the children's mean age ( $F(2, 381) = 1.40, p = .248$ ), nor family structure (single-parent vs. not) ( $\chi^2 = 0.34, df = 2, p = .846$ ). However, gender of the child was significantly related to classes ( $\chi^2 = 8.78, df = 2, p = .012$ ), with pairwise comparisons revealing that compared to boys, girls were more likely to be assigned to the C-PTSD class.

### 3.2. Changes in symptomatology following TF-CBT within classes

To address our second objective, paired *t*-test analyses were conducted to explore possible changes from pretreatment to posttreatment scores for children

participating in TF-CBT (Figure 2). Outcomes measures considered were continuous scores of child-reported PTSD symptoms as well as dissociation symptoms, internalizing and externalizing behaviour problems as assessed by parental reports. Paired *t*-test analyses showed an improvement following TF-CBT for children assigned to the *Complex PTSD* class and children in the *Classic PTSD* class for the continuous score of PTSD symptoms, the *Complex PTSD* class showing a greater change ( $d = 0.90; 95\%CI: 0.63-1.16$ ).

Children for all three classes showed significant changes following treatment, revealing a decrease in dissociative symptoms as well as in internalizing and externalizing behaviour problems reported by their parents. The *Complex PTSD* class consistently showed the largest effect size ( $d = .76-.78$ ), suggesting greater improvement following treatment. The results are presented in Table 3.

Changes in C-PTSD symptoms (affect dysregulation, impairment in self-concept, and interpersonal relationships) for children in the *Complex PTSD* class were also examined. Results revealed that children showed significant improvements in all three domains of C-PTSD. Thus, children reported lower scores for items assessing impairment in self-concept after participating in TF-CBT (Pretreatment:  $M = 1.17, SD = .78$ ; Posttreatment  $M = .60, SD = .67; t(77) = 6.50, d = 0.74, p < .001$ ). Effect sizes translating to medium effects were also found for emotion dysregulation (Pretreatment:  $M = 1.76, SD = .43$ ; Posttreatment  $M = 1.22, SD = .82; t(77) = 5.71, d = 0.65, p < .001$ ) as well as interpersonal problems (Pretreatment:  $M = 1.38, SD = .67$ ; Posttreatment

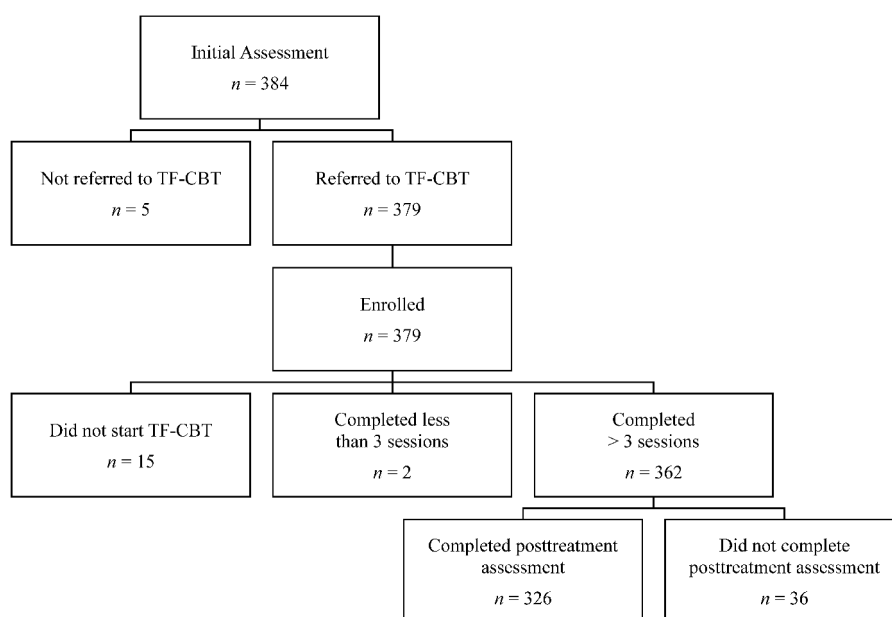


Figure 2. Participant flowchart.

**Table 3.** Means and standard deviations of symptoms at pretreatment and posttreatment and effect sizes for each class ( $n = 326$ ).

			Post-traumatic stress disorder	Dissociation	Internalizing behaviour problems	Externalizing behaviour problems
C-PTSD	Pretreatment	<i>M (SD)</i>	62.63 (10.12)	10.03 (6.11)	64.23 (9.40)	65.51 (9.08)
	Posttreatment	<i>M (SD)</i>	43.97 (20.61)	5.45 (4.89)	55.67 (9.79)	58.96 (10.04)
	t-test statistic		$t_{(77)} = 7.94^{***}$	$t_{(76)} = 6.88^{***}$	$t_{(74)} = 6.78^{***}$	$t_{(74)} = 6.55^{***}$
	Cohen's <i>d</i>		.90	.78	.78	.76
	95% CI for Cohen's <i>d</i>		.63–1.16	.53–1.04	.52–1.04	.50–1.01
PTSD	Pretreatment	<i>M (SD)</i>	38.52 (12.16)	7.77 (5.85)	62.15 (10.07)	62.78 (10.34)
	Posttreatment	<i>M (SD)</i>	31.08 (16.31)	5.31 (5.21)	55.84 (10.78)	58.05 (10.36)
	t-test statistic		$t_{(161)} = 6.39^{***}$	$t_{(158)} = 6.78^{***}$	$t_{(157)} = 8.27^{***}$	$t_{(157)} = 7.36^{***}$
	Cohen's <i>d</i>		.50	.54	.66	.59
	95% CI for Cohen's <i>d</i>		.34–0.67	.37–0.70	.49–0.83	.42–0.75
Resilient	Pretreatment	<i>M (SD)</i>	20.54 (11.43)	7.48 (6.44)	60.03 (10.08)	60.32 (10.80)
	Posttreatment	<i>M (SD)</i>	20.25 (13.95)	4.23 (4.50)	52.45 (10.90)	56.00 (10.45)
	t-test statistic		$t_{(75)} = 0.16$	$t_{(74)} = 5.55^{***}$	$t_{(73)} = 6.72^{***}$	$t_{(73)} = 4.89^{***}$
	Cohen's <i>d</i>		.02	.64	.78	.57
	95% CI for Cohen's <i>d</i>		–0.21–0.24	.39–0.89	.52–1.04	.32–0.81

Note: \*\*\* $p < .001$ , PTSD, Post-traumatic stress disorders; C-PTSD, Complex post-traumatic stress disorder. C-PTSD  $n = 79$ ; PTSD  $n = 170$ ; Resilient  $n = 77$ .

$M = .92$ ,  $SD = .72$ ;  $t(77) = 4.42$ ,  $d = 0.50$ ,  $p < .001$ ). Finally, the average number of sessions attended for participants from each class was computed. Results showed no significant difference between classes in terms of the number of therapy sessions (Resilient:  $M = 14.16$ ,  $SD = 4.67$ ; PTSD:  $M = 14.60$ ,  $SD = 4.52$ ; C-PTSD:  $M = 14.54$ ,  $SD = 3.89$ , ( $F(2,322) = .28$ ,  $p = .75$ ).

#### 4. Discussion

The purpose of this study was to first identify profiles of symptoms, based on the ICD-11 C-PTSD model, in a sample of child victims of sexual abuse. Our findings highlight the diversity of profiles in a treatment-seeking sample of child victims of sexual abuse, as a three-class model was identified. As expected, a profile describing children showing classic PTSD symptoms of re-experiencing, avoidance and hypervigilance emerged and regrouped about half of the sample. Past studies have described PTSD symptoms as characteristics of child victims of sexual abuse, with up to 57% displaying clinical levels of symptoms (Nooner et al., 2012). Empirical data has also highlighted the frequent presence of multiple forms of maltreatment (for e.g. sexual abuse, exposure to partner violence, neglect) in the same family and that for a number of trauma-exposed youths, trauma is best characterized by co-occurring forms of victimization (Finkelhor, Ormrod, & Turner, 2007). Symptoms of classic PTSD would fail to identify the constellation of difficulties experienced by children who experience repetitive and chronic violence in an inadequate family environment (van der Kolk et al., 2009). Scholars have proposed that C-PTSD may better describe the array of impairments that some children may show following adverse life events such as sexual abuse. Our data suggest that for 23% of children, the impact of sexual

abuse does indeed go beyond PTSD and they are likely to display as well, manifestations of impairment more akin to the C-PTSD symptom cluster. Our analysis suggests that, relative to boys, girls are more likely to be assigned to the *Complex PTSD* class, which is consistent with past findings (Sachser et al., 2016).

The third class regrouped 25% of sexually abused children that showed low levels of PTSD symptoms and may be best described as resilient. Numerous scholars have proposed that some sexually abused victims may display better outcomes (Domhardt, Münzer, Fegert, & Golbeck, 2015; Marriott, Hamilton-Giachritsis, & Harrop, 2014). Not only do youths experience quite diverse situations of abuse, but it is also highly improbable that all have the same personal competencies to deal with the trauma and that all benefit from the same familial or extra-familial environment to help them in this task. It is well known that personal, familial, and environmental factors may protect against negative outcomes following adverse life events such as child sexual abuse (Masten, 2014). For instance, efficient coping skills, parental support as well as peer support may lessen the emergence of severe PTSD symptoms (Hébert, Lavoie, & Blais, 2014; Shapiro, Kaplow, Amaya-Jackson, & Dodge, 2012).

The second objective of this study was to examine whether TF-CBT was associated with change in symptomatology for the different classes identified. As expected, children in the *Classic PTSD* class showed significant improvement after treatment as they reported less PTSD symptoms. In addition, parental reports indicated that the therapy was effective in reducing dissociation symptoms as well internalizing and externalizing behaviour problems. TF-CBT was also associated with improvement among children in the *Complex PTSD* class, showing positive changes in

symptomatology not only for PTSD symptoms, dissociation, and behaviour problems, but also for domains included in the C-PTSD category, namely as affect regulation, self-concept and interpersonal relationships. In sum, our results offer further support that TF-CBT is an effective therapy to address the negative outcomes associated with sexual abuse. Our findings also highlight that TF-CBT may as well improve outcomes in children displaying more complex symptomatology akin to the C-PTSD domains of impairment.

Children classified in the *Resilient* class did not show a significant reduction of PTSD symptoms, which may be related to the low levels of PTSD symptoms shown in the initial assessment. It is important to note, however, that involvement in TF-CBT has nonetheless provided for a significant reduction of dissociation, internalizing, and externalizing behaviour symptoms. These results underscore the relevance of providing these children – albeit functioning at higher levels than children from the two other classes – with therapy. Components of TF-CBT, including psychoeducation and parenting skills, relaxation, enhancing personal safety, and conjoint parent-child sessions with non-offending parents, may be essential ingredients to sustain resilience as well as means to prevent revictimization, which is unfortunately frequent in child victims of sexual abuse (Walker, Freud, Ellis, Fraine, & Wilson, 2019).

#### 4.1. Clinical implications

Disentangling the diversity of symptom profiles offers a first step to identifying more personalized treatment protocols tailored to the needs of each child victim. Our findings underscore the relevance for mental health professionals offering services to children confronted to sexual abuse, to assess PTSD as well as C-PTSD symptom clusters. Assessment at clinical intake may offer relevant cues for treatment orientation that can foster recovery in all child victims of sexual abuse.

Given the diversity of profiles in child victims of sexual abuse, a modular approach to treatment may be a relevant strategy to consider. A component-based approach allowing for flexibility and sequencing using a guiding clinical algorithm has been designed and found to be quite efficient in treating children with anxiety, depression, or conduct problems (Chorpita et al., 2013), and could offer an optimal strategy to promote recovery for all children who have experienced sexual abuse. An algorithm, based on the emerged three-class model, combined with a detailed clinical assessment could be used to orient treatment options. Children displaying a Classic PTSD profile could benefit from TF-CBT in the standard format, while children showing a pattern of adaptation similar to the Resilient class could require a smaller number of sessions. A periodic reassessment could be warranted to

explore the potential latent effects – symptoms manifesting if the child is confronted to other major life events or entering a specific developmental stage – that may trigger the onset of symptoms. TF-CBT with additional modules targeting specifically affect dysregulation, relational and social difficulties or aiming to enhance positive self-concept could be prioritized for children displaying a profile of Complex PTSD. Such an approach could optimize treatment outcomes. Results reveal that modular treatment is associated with steeper trajectories of recovery in children referred for depression, anxiety, and conduct problems compared to usual care or standard treatment (Weisz et al., 2012).

#### 4.2. Limitations

Our findings should be interpreted in light of some limitations. C-PTSD diagnostics as proposed by ICD-11 were modelled using a selection of symptoms derived from other measures, as there is presently no measure specifically developed for assessing C-PTSD in children. Our design did not include a follow-up assessment to ascertain whether therapeutic gains were maintained over time. Future studies will need to do so and investigate the stability of the emerged three profiles over time. Apart from symptomatology, other variables not considered in the present study could have an impact on treatment response. For instance, the non-offending caregiver's level of adherence to therapy and session attendance. Additional moderators of treatment outcomes such as contextual factors (socioeconomic disadvantage, level of parental distress, etc.) could affect progress over the course of therapy.

In conclusion, three subgroups of treatment-seeking child victims of sexual abuse could be empirically distinguished based on different patterns of symptom presentation. In addition to identifying a profile of resilient children, the latent class analysis provided evidence for the distinction between PTSD and C-PTSD in children confronted to sexual violence. The current therapy, identified as a best practice – TF-CBT – was found to be effective in fostering recovery for all children and in reducing C-PTSD symptoms for children assigned to the Complex PTSD class.

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## Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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