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Exploring the Complex Relationship Between Childhood Trauma and Self-Harm

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ABSTRACT

Previous research has linked self-harm to adverse childhood experiences (i.e. abuse and neglect). Despite the extensive literature on self-harm, it remains of high importance to examine psychological predictors of repetitive self-harming behaviors in those who report childhood trauma. This study explored the role of maladaptive emotion regulation strategies, dissociation proneness, and borderline personality (BP) features. An international sample with $n = 374$ participants ($N = 287$, 77%, reporting intentional use of self-harm), was recruited online via relevant mental health platforms and research sites. Within an anonymous survey, participants completed the Self-harm Inventory, Childhood Trauma Questionnaire, Dissociative Experience Scale, Cognitive Emotion Regulation Questionnaire, and Personality Assessment Inventory-Borderline Personality Features Scale. Structural equation modeling (SEM) was used to explore direct and indirect effects. Self-harm was positively correlated to severity of childhood trauma, maladaptive emotion regulation strategies, dissociation, and BP features. In the path-analytical model, independent indirect effects of childhood trauma severity via self-blame, catastrophizing, dissociation, as well as BP features on self-harm were found. Maladaptive emotion regulation, dissociation proneness, and BP features all seem to be important intermediary agents in the close association between childhood trauma and self-harm.

Self-harm can take various forms, which frequently co-occur (Klonsky et al., 2003; Selby et al., 2014). In a broader sense, it involves any kind of intentionally self-damaging, highly risky, or suicidal behavior (Hawton et al., 2012; Reichl & Kaess, 2021; Sansone & Sansone, 2010). Non-suicidal self-injury (NSSI) more specifically refers to deliberate bodily tissue damage without clear suicidal intent, e.g., skin cutting, burning, or hitting (American Psychiatric Association, 2013; Klonsky, 2007; Nock & Favazza, 2009). In the current study, we used the broader definition given the broad spectrum of self-

damaging behaviors that can be observed in vulnerable populations, e.g., those with traumatic childhood experiences.

In the general population, self-harm is especially prevalent in adolescents (17%). In adults prevalence rates are around 6% (Brown & Plener, 2017; Brunner et al., 2014; Hawton et al., 2012; Klonsky et al., 2003; Plener et al., 2015; Whitlock et al., 2006). Women are more likely to engage in self-harm, particularly NSSI, than men (Plener et al., 2015; Whitlock et al., 2006; Zetterqvist et al., 2013). Due to fear of stigmatization, self-harm is often not disclosed to family members or mental health care professionals (Whitlock et al., 2006). Instead, social media are frequently used as an outlet to share experiences with NSSI (Brown et al., 2020; Hawton et al., 2012). Self-harm and the intention to die are not necessarily related, although prospective studies have linked NSSI to an increased risk of dying by suicide (Groschwitz et al., 2015; Hawton et al., 2012; Ribeiro et al., 2016).

Several psychological functions of self-harming behaviors have been proposed, including both intra-individual functions (e.g., emotion regulation, ending dissociation) and interpersonal functions (e.g., peer bonding, seeking support; Klonsky et al., 2015; Wolff et al., 2019). Regulating stressful experiences is an important internal function of self-harm, also in non-clinical populations (Klonsky et al., 2015; Wolff et al., 2019). While self-harm may help to immediately escape stressful experiences, it can cause a wide range of social, occupational, and health problems, and increase affective vulnerability, e.g., due to shame and guilt (Brereton & McGlinchey, 2020; Chapman et al., 2006; Klonsky, 2009; Klonsky et al., 2015; Selby et al., 2014). This underscores the need to detect other psychological factors underlying self-harm.

A history of childhood trauma (emotional, physical, and sexual abuse, and neglect) has been linked to a higher frequency of self-harm in both psychiatric and non-psychiatric populations (Liu et al., 2018; Serafini et al., 2017). Findings point to a particularly strong link for emotional abuse (e.g., experiences of invalidation, devaluation, or rejection; Kaess et al., 2013; Liu et al., 2018). Also when controlling for other forms of abuse, emotional abuse was the strongest predictor for self-harm in a study by Thomassin et al. (2016). In a representative sample drawn from the general population, 72% of those who engaged in repeated NSSI reported childhood emotional abuse.

The close association between childhood trauma and self-harm may be partly explained by the aforementioned regulatory function of self-harm (Černis et al., 2019; Swannell et al., 2012; Talmon & Ginzburg, 2021; Yates et al., 2008). Self-harm may be conceptualized as a coping strategy to deal with unbearable experiences (Chapman et al., 2006). It is also often used to terminate unwanted states of numbness (i.e., reconnect with reality during dissociation; Gardner et al., 2021; Kleindienst et al., 2011). Dissociation includes symptoms such as derealization and depersonalization, absorption, and

amnesia (Nester et al., 2022; Webermann et al., 2016), during which pain perception is often reduced (Ludäscher et al., 2007).

Several studies found a mediating effect of maladaptive emotion regulation strategies, particularly self-blame, in the association between adverse childhood experiences and self-harm; for adolescent inpatients (Peh et al., 2017; Titelius et al., 2018), female prisoners (Howard et al., 2017), college students (Espeleta et al., 2018), and in a sample from the general population (Swannell et al., 2012). In addition, dissociation mediated the link between childhood trauma severity and self-harm in adolescents (Černis et al., 2019), college students (Talmon & Ginzburg, 2021), community samples (Swannell et al., 2012; Yates et al., 2008) as well as in patients with trauma-related disorders and dissociative disorders (Ford & Gómez, 2015; Franzke et al., 2015). All in all, adverse childhood experiences may promote the use of maladaptive emotion regulation strategies and dissociation and thereby increase the risk for developing various psychopathologies (Porter et al., 2020; Spinhoven et al., 2016; Vonderlin et al., 2018).

This may further be related to the presence of borderline personality features. Maladaptive emotion regulation and dissociation are part of BPD psychopathology. Self-harm is a symptom of various psychiatric conditions (Klonsky, 2007), especially borderline personality disorder (BPD) (Bohus et al., 2021; Goodman et al., 2017; Groschwitz et al., 2015; Reichl & Kaess, 2021). Yet, other ´borderline personality´ features may play an important role as well. More specifically, this may be the case for instable mood and self-image, insecure attachment, and impulsivity. Across different samples, self-harm has been related to the instability in affect, sense of self, and relationships that people with (sub-clinical expressions of) BPD experience (Brickman et al., 2014; Cerutti et al., 2012; Kaplan et al., 2016; Marques-Feixa et al., 2021; Nakar et al., 2016; Somma et al., 2017; Vega et al., 2017).

In summary, different psychological pathways (through emotion regulation, dissociation, and borderline personality features) have been implicated in the link between childhood trauma and self-harm. To our knowledge, no study so far explored these psychological pathways together in one comprehensive path-analytical model. The present study aimed to simultaneously explore these pathways using structural equation modeling, which allows for estimating different indirect paths in the same model. Specifically, we investigated 1) whether more severe childhood trauma (abuse and neglect) predicts higher levels of self-harm, and 2) whether indirect effects of childhood trauma via emotion regulation, dissociation, as well as borderline personality features on self-harm can be found. Based on previous research, we hypothesized that more severe experiences of childhood trauma, especially emotional abuse, predict more self-harming behaviors. We further expected significant indirect effects through maladaptive emotion regulation and dissociation as well as through borderline personality features.

Methods

Participants and procedure

An international sample of participants was recruited. Respondents were informed about the background and aims of the study, inclusion criteria, potential risks, and the right to terminate participation without any negative consequences. Data collection took place online via an anonymous survey presented with the software Qualtrics (Qc 2015, Qualtrics, Provo, UT). The survey could be accessed through a hyperlink or a QR code. Considering the nature of the questionnaires, a disclaimer was added to the posts and information letter, and contact details of the principal investigator (A.K-U) were provided. Survey completion took approximately 35–45 minutes. The study was approved by the local ethical committee.

Participants were recruited via online mental health platforms and social media (Facebook, Twitter). In addition, we advertised the study on the research platform for students of Leiden University. Inclusion criteria were age ≥18 years and sufficient English proficiency. Participants could participate in a lottery (one of eleven 25€ Amazon vouchers) and students could acquire two study credits. A final sample of $N = 374$ female and male adults between 18 and 66 could be included. Mean age was 24.04 ($SD= 7.45$, range: 18–66). Participants were mostly female ($N = 256$; 68%) and European ($N = 314$; 84%; other nationalities: American: $N = 26$, Asian: $N = 16$, Middle East: $N = 7$). Half of the sample completed Secondary School ($N = 200$, 53%) or higher education ($n = 173$, 46%). Eighty participants (21%) were currently in treatment for mental health.

In this sample, $N = 287$ (77%) reported any intentional use of self-harm, using one or multiple of the following forms *on purpose with the intent to injure themselves*: Skin cutting: $N = 95$ (25%), hitting/banging ($N = 132$, 35%), injuring skin by scratching ($N = 127$, 34%), burning ($N = 38$, 10%), skipping important medication ($N = 46$, 12%), preventing wounds from healing ($N = 65$, 17%), exercising injuries ($N = 46$, 12%), overdosing alcohol and medication ($N = 160$, 43%) or drugs ($N = 31$, 8%), sexual risk taking ($N = 78$, 21%), and starving ($N = 75$, 20%). Thirty-six participants (10%) reported a previous suicide attempt.

Severe to extreme childhood trauma was reported by $N = 129$ participants, mostly emotional abuse (34%), followed by sexual abuse ($N = 112$, 30%), physical abuse ($N = 72$, 19%), emotional neglect ($N = 86$, 23%), and physical neglect ($N = 78$, 21%). Seventy-six participants (20%) scored above the cutoff for BPD features on the Personality Assessment Inventory-Borderline Features Scale (PAI-BOR >37). Seventy-five participants (20%) scored above the cutoff for clinical dissociative symptoms on the Dissociative Experience Scale (DES >30). Means with standard deviation (SD) of all scales can be found in Table 1.

Table 1. Sample characteristics.

	Mean, SD
Childhood maltreatment	
CTQ sum	35.18 ± 14.00
Emotional Abuse	8.80 ± 4.56
Physical Abuse	6.29 ± 2.91
Sexual Abuse	6.18 ± 3.38
Emotional Neglect	7.45 ± 3.72
Physical Neglect	6.46 ± 2.71
Self harm	
SHI	18.23 ± 2.47
BPD features/symptoms	
PAI sum	26.91 ± 12.76
PAI Affective Instability	7.27 ± 4.19
PAI Identity Disturbance	8.16 ± 4.02
PAI Negative Relationships	6.96 ± 3.75
PAI Impulsive Self-Harm	4.62 ± 3.61
DES sum	16.14 ± 24.59
CERQ	
Rumination	10.84 ± 3.74
Self-blame	10.56 ± 3.80
Catastrophizing	7.39 ± 3.35

Note: BPD=Borderline Personality Disorder features; CERQ=Cognitive Emotion Regulation Questionnaire; CTQ=Childhood Trauma Questionnaire; DES=Dissociative Experience Scale; PAI-BOR=PAI Borderline Features Scale; SHI=Self Harm Inventory, SD=Standard Deviation.

Measures

Self-Harm Inventory (SHI)

Self-harming behaviors were assessed using the Self Harm Inventory (SHI; Sansone & Sansone, 2010; Sansone et al., 1998, 2018). This scale includes 22 items on NSSI (skin cutting, burning, hitting), different forms of suicidal or high-risk behaviors (drug overdose, starving, purging, high risk behavior, and risky sexual activities) as well as suicide attempts. Participants are asked to indicate whether they engaged in the respective behavior "intentionally, on purpose, to hurt themselves" and how often. Scores on all items are summed up to create a total score. The SHI has shown good psychometric properties for the use in psychiatric samples, primary care settings, and in the general population (Sansone et al., 1998), including good validity and reliability (Latimer et al., 2009; Sellbom et al., 2017). In the present sample, Cronbach ´s alpha for the SHI was α = .87.

Childhood trauma questionnaire (CTQ-SF)

Childhood trauma was assessed using the short version of the Childhood Trauma Questionnaire (CTQ-SF; Bernstein et al., 2003). The scale includes 28 items on emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect (5 items each, plus three validity items, answered on a five-point Likert scale between 1= never true to 5= very often true). The CTQ previously showed good

convergent validity with therapist ratings, test-retest reliability between .79 to .84, and internal consistency coefficients between α = .66 and .92 (Bernstein et al., 2003; Dudeck et al., 2015; Karos et al., 2014). In the present sample, Cronbach`s alpha was α =.93.

Personality assessment inventory-borderline features scale (PAI-BOR)

Borderline personality features were assessed with the Personality Assessment Inventory-Borderline Features Scale (PAI-BOR; Jackson & Trull, 2001). The PAI-BOR is a 24-item self-report inventory with four subscales, assessing affective instability, identity disturbance, negative relationships, and self-damaging impulsivity. There are six items per subscale, ranging from 0= false to 3=very true. A raw total score of 38 is considered a cutoff for clinically relevant features. Internal consistencies ranged from .77 to .84 in previous studies (Stepp et al., 2014) and was α = .90 in the present study.

Cognitive emotion regulation questionnaire short version (CERQ)

Maladaptive emotion regulation was measured using subscales of the Cognitive Emotion Regulation Questionnaire short version (CERQ; Garnefski & Kraaij, 2006a). The CERQ short version includes 18-item on specific cognitive emotion regulation strategies used as a response to a negative life event (between "1= almost never" to "5= al- most always"). For the current study, we focused on the four "maladaptive" subscales self-blame, rumination (repetitive thinking about aspects and feelings associated with the event), catastrophizing (emphasizing the terror of the experience), and other-blame, which have been linked to maladaptive mental health outcomes (Garnefski & Kraaij, 2006b) and self-harm (Swannell et al., 2012). The CERQ has shown good reliability and internal consistency (Garnefski & Kraaij, 2006b; Krause-Utz et al., 2018), with a Cronbach´s alpha of α = .89 in the present study.

Dissociative experience scale (DES)

Dissociation was measures with the Dissociative Experience Scale (DES; Bernstein & Putnam, 1986). The DES includes 28 items on dissociative experiences (e.g., "[. . .] finding yourself in a place and have no idea how you got there") that are rated on a 0–100% scale (0%=never applied to me to 100%=always applies to me). An overall mean score of 30 has been established as cutoff for clinically severe symptoms. The DES previously showed good convergent validity and internal consistency (α = .93) (Vanijzendoorn & Schuengel, 1996). In the present sample, Cronbach´s alpha for the DES was α = .94.

Structural equation modeling

Data was analyzed using IBM SPSS 23.0 (SPSS Inc, Chicago, Illinois). The significance level was set at $p < .05$, two-tailed. Prior to the analysis, assumptions of linearity, normality of residuals, homoscedasticity and independence of residuals, and outliers (Cook's distance, Leverage values) were checked. The distribution of CTQ variables was not normally distributed. To account for this, we used non-parametric procedures where possible. Underlying associations between the variables were examined using Spearman rank correlations (correlations were mostly small to moderate: $r \leq 0.55$, see Table 2). All VIF and tolerance values were in an acceptable range (VIF <1.5), suggesting that multicollinearity was not a concern. Age and gender were included as relevant covariates.

We used structural equation modeling (SEM) to test direct and indirect effects. Lavaan package (version 0.6–9, with MLR estimator, i.e., maximum likelihood estimation with robust [Huber-White] standard errors) in the software R (version 4.0.2) (Rosseel, 2012) was applied. The advantage of SEM is that it allows for simultaneously estimating different indirect pathways. Constructs can be modeled as latent factors. Self-harm, as a latent variable, was operationalized using the total score of the SHI. To define the latent factor of maladaptive emotion regulation, the CERQ subscales were used. For dissociation, we included the observed total DES score. The latent variable borderline personality (BP) features was defined by the subscales of the PAI-BOR. Childhood trauma was defined as a latent variable using the CTQ subscale scores as indicators. We first estimated a model with the total effect of childhood trauma on self-harm (with only the covariates gender and age included). In another model, indirect effects through maladaptive emotion regulation, dissociation, and BP features were modeled simultaneously. Gender and age were taken into account as covariates.

Since we were specifically interested in emotional childhood trauma, we performed a follow-up analysis with the specific CTQ subscales (emotional, physical, sexual abuse and neglect) as individual predictors instead of one latent variable (CTQ sum score). A good fit for the models was defined by robust CFI > .90, scaled NFI >.90 and scaled RMSEA <.10, acknowledging that cutoffs may vary depending on model complexity and sample size (Cheung & Rensvold, 2002; Marsh et al., 2004).

Results

Effect of childhood trauma on self-harm

The model estimating the "total" effect of childhood trauma severity on self-harm (when only including age and gender as covariates) showed a good fit to the data (CFI = .93, NFI = 0.91, RMSEA = 0.09, 95% CI [0.07, 0.11]). Severity

Table 2. Bivariate Spearman correlations between all variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Self-harm	-													
2. CTQ EA	.081*	-												
3. CTQ PA.	.022	.603***	-											
4. CTQ SA.	-.021	.529***	.464***	-										
5. CTQ EN	.463***	.230***	.099**	.096*	-									
6. CTQ PN	.203***	.566***	.412***	.489***	.571***	-								
7. CERQ	.034	.062	.032	-.048	-.327***	-.323***	-							
8. DES	.536***	.410***	.209***	.307***	.264***	.288***	.465***	-						
9. PAI-BOR AI	.170***	.467***	.337***	.326***	.159***	.327***	.280***	.498***	-					
10. PAI-BOR ID	.147***	.442***	.246***	.310***	.121**	.245***	.368***	.537***	.647***	-				
11. PAI-BOR NR	.186***	.502***	.363***	.332***	.146***	.364***	.252***	.507***	.652***	.636***	-			
12. PAI-BOR SH	.154***	.317***	.195***	.240***	.102**	.229***	.192***	.410***	.425***	.397***	.369***	-		
13. Age	.007	.262***	.313***	.344***	.131***	.352***	-.238***	-.157***	.124***	-.052	.103**	.047	-	
14. Gender	-.014	.106**	-.058	.084*	-.002	.046	-.004	.138**	.105**	.155***	.149***	-.009	-.126***	-

Note: This table show partial Pearson correlations, controlling for gender. * $p < .05$. ** $p < .01$; *** $p < .001$.
CTQ=Childhood Trauma Questionnaire; EA=Emotional Abuse; PA=Physical Abuse, SA=Sexual Abuse; EN=Emotional Neglect; PN=Physical Neglect.
CERQ=Cognitive Emotion Regulation Questionnaire; DES =Dissociative Experiences Scale.
PAI-BOR=Personality Assessment Inventory Borderline Feature Scale; AI=Affective instability, ID=Identity Disturbance; NR=Negative Relationships; SH=Self-harming impulsivity.

of childhood trauma (as indicated by the five CTQ subscales) was positively related to self-harm (SHI sum) (b = 0.58, SE = 0.05, z = 11.55, p < .001, $std.b$ = 0.56).

Overall model including emotion regulation, dissociation, and BP features

The overall model where both direct and indirect effect were assessed in the relation to self-harm showed a good model fit (CFI = 0.94, NFI = 0.91, RMSEA = 0.07, 95% CI [0.06, 0.08]. Full results and model parameters are in found in Supplemental Table 1 and summarized in Figure 1. Childhood trauma severity remained associated with self-harm (b = 0.20, SE = 0.06, z = 3.29, p = .001, $std.b$ = 0.20). In addition, more BP features (b = 0.83, SE = 0.17, z = 4.80, p < .001, $std.b$ = 0.43), and more dissociation (b = 0.04, SE = 0.01, z = 3.55, p < .001, $std.b$ = 0.21) were related to more self-harm. Among the maladaptive emotion regulation strategies, self-harm was associated with more self-blame (b = 0.17, SE = 0.06, z = 3.11, p = .002, $std.b$ = 0.16), less other-blame (b = −0.24, SE = 0.09, z = −2.73, p = .006, $std.b$ = −0.10), and less catastrophizing (b = −0.14, SE = 0.05, z = −2.53, p = .011, $std.b$ = −0.11),
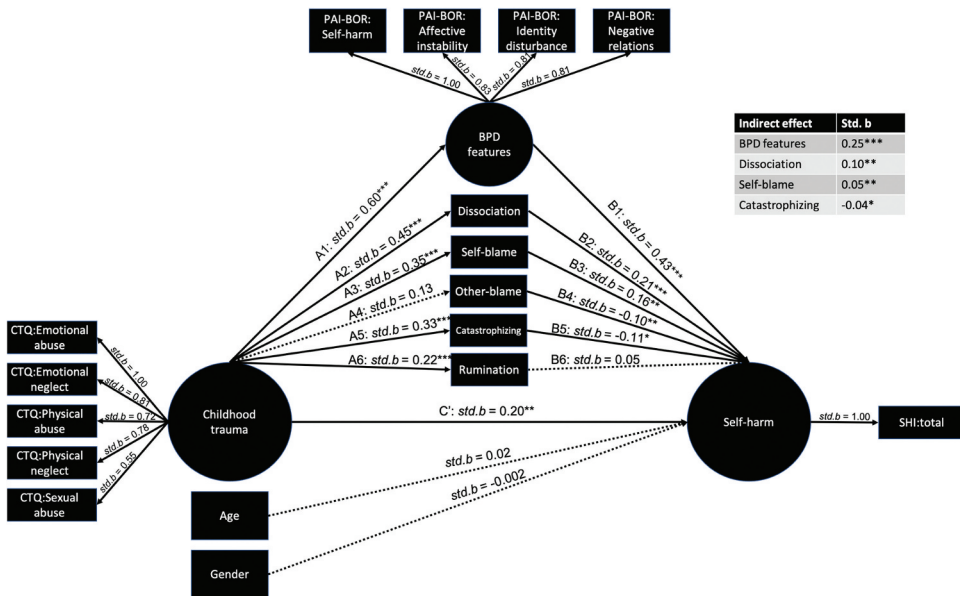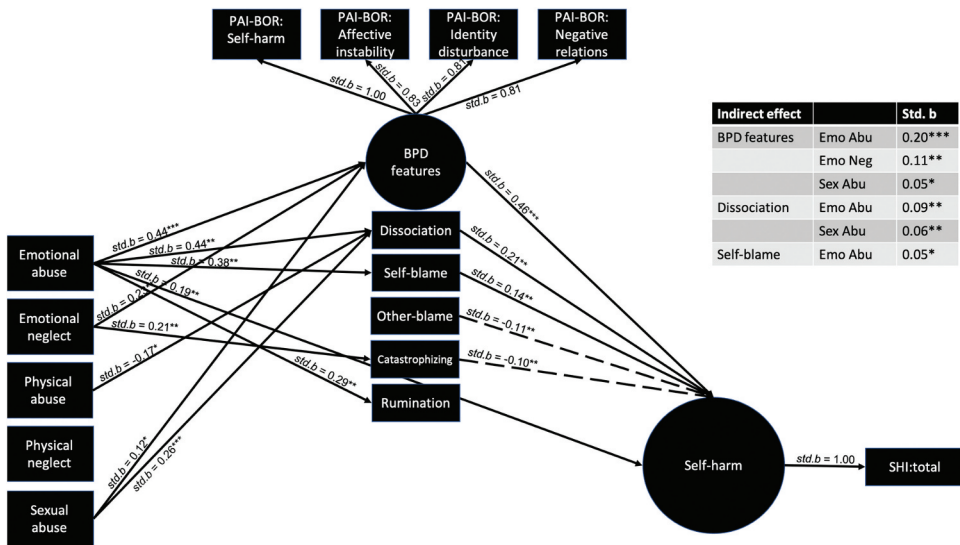

Figure 1. Structural equation Model results with indirect effects of BPD features, dissociation and cognitive coping in the relation between childhood trauma and self-harm. Note: latent factors are shown as ovals. Observed variables are depicted as rectangles. Standardized parameters are depicted with p-value indicated as follows * <.05, ** <.01, *** <.001. Solid lines indicate significant paths whereas dotted lines indicate modeled but non-significant paths. CTQ = Childhood Trauma Questionnaire. PAI-BOR = Personality Assessment Inventory-Borderline Features Scale. SHI = Self-harm Inventory.

while showing no significant association with rumination (b =0.06, SE = 0.06, z = 0.99, p = .322, $std.b$ = 0.05). There were no significant effects of gender or age. Overall, BP features were the strongest predictor.

Significant indirect effects of childhood trauma severity through self-blame, catastrophizing, dissociation, and BP features were found (BP features: b = 0.25, SE = 0.06, z = 4.30, p < .001, $std.b$ = 0.25; dissociation: b = 0.10, SE = 0.03, z = 3.02, p = .003, $std.b$ = 0.10; self-blame: b = 0.05, SE = 0.02, z = 2.93, p = .003, $std.b$ = 0.05; catastrophizing: b = −0.04, SE = 0.02, z = −2.23, p = .026, $std.b$ = −0.04, see Figure 1.

Follow up analyses for childhood trauma subtypes

The analysis with the five CTQ subscales showed a good model fit (CFI = 0.97, NFI = 0.95, RMSEA = 0.07, 95% CI [0.06, 0.09]. Full results can be found in Supplementary Table S2. There was a significant direct effect of emotional abuse on self-harm (b = 0.17, SE = 0.07, z = 2.59, p = .009, $std.b$ = 0.19). None of the other forms of childhood trauma showed a significant direct effect (p > .321). As illustrated in Figure 2, there was a significant indirect effect of emotional abuse, emotional neglect as well as sexual abuse through BP features on self-harm.

Figure 2. Structural equation model results subscales of CTQ. Note: latent factors are shown as ovals. Observed variables are depicted as rectangles. Standardized parameters are depicted with p-value indicated as follows * <.05, ** <.01, *** <.001. Only significant paths are depicted where solid lines positive relation and dashed lines indicate negative relation. CTQ = Childhood Trauma Questionnaire. PAI-BOR = Personality Assessment Inventory-Borderline Features Scale. SHI = Self-harm Inventory.

Moreover, there was a significant indirect effect of emotional abuse and sexual abuse through dissociation. The indirect effect of emotional abuse through self-blame was also significant.

Discussion

The aim of this study was to investigate possible pathways through which traumatic childhood experiences may be linked to self-harm, i.e., through maladaptive emotion regulation strategies, dissociation proneness, and BP features. In line with our hypotheses and earlier research, self-harm was positively related to severity of childhood trauma (especially emotional abuse), self-blame, dissociation, as well as BP features. Childhood trauma severity was indirectly linked to self-harm via maladaptive emotion regulation strategies (particularly self-blame and catastrophizing), dissociation, as well as BP features.

Associations between self-harm and traumatic childhood experiences were particularly strong for emotional abuse, which is in line with previous studies (Brown et al., 2018; Kaess et al., 2013; Liu et al., 2018; Thomassin et al., 2016). Of note, other forms of abuse may rarely occur in isolation. Overall childhood trauma severity was related to self-harm in our study as well, confirming earlier research (Liu et al., 2018; Serafini et al., 2017). Adverse childhood experiences can interfere with the development of adaptive emotion regulation skills and a stable identity (Eisenberg et al., 2010; Spinhoven et al., 2016; Vonderlin et al., 2018). In our study, emotional abuse was indirectly linked to self-harm via self-blame, dissociation, and BP features, while still showing a significant direct effect on self-harm. Interestingly, sexual abuse was not directly but indirectly linked to self-harm through dissociation and BP features, which suggests that these symptoms or dispositions may represent important underlying pathways.

In line with this, several studies found an indirect effect of childhood trauma via maladaptive emotion regulation strategies, including self-blame, on self-harm (Espeleta et al., 2018; Howard et al., 2017; Peh et al., 2017; Titelius et al., 2018). Other studies found a similar indirect effect via dissociation (Černis et al., 2019; Ford & Gómez, 2015; Franzke et al., 2015; Talmon & Ginzburg, 2021; Yates et al., 2008) or via both self-blame and dissociation (Swannell et al., 2012).

Self-harm can have various intra-individual and interpersonal functions, including the regulation of emotions and dissociative states (Klonsky et al., 2015; Wolff et al., 2019). It can offer a temporary distraction or escape from unbearable experiences and provide stress relief, which negatively reinforces its continued use (Chapman et al., 2006). With respect to specific emotion regulation strategies, self-harm was positively related to self-blame in our study, while it was negatively associated with catastrophizing and other-blame. A possible explanation for the negative associations is that self-harm

may also function as a form of self-punishment (Klonsky, 2009), being associated with more internalizing symptoms (Piqueras et al., 2019). By directing the aggression toward oneself, self-harm may alleviate feelings of anger toward others ("other blame"). Catastrophizing is associated with risk aversion and pain-related worries or fears, which may lower the use of risky self-harming behaviors (Quartana et al., 2009). It is also possible that people who use self-harm experience it as a helpful way to distract themselves from constantly thinking about negative experiences and their impact, indicated by less catastrophizing. While we focused on specific cognitive strategies, previous studies suggest that limited awareness, clarity, and acceptance of emotions may exaggerate the use of self-harm in individuals who lack adaptive strategies (e.g., Espeleta et al., 2018).

Extending previous research, we additionally investigated the role of BP features, which turned out to be the strongest predictor for self-harm in our comprehensive model. Since we focused on features, our findings are not comparable with studies that included patients with a BPD diagnosis (e.g., Goodman et al., 2017; Reichl & Kaess, 2021) and may not represent this clinical group. Yet, several studies suggest that self-harm is also linked to subclinical features of the disorder (Brickman et al., 2014; Cerutti et al., 2012; Marques-Feixa et al., 2021; Somma et al., 2017; Vega et al., 2017).

Limitations and future research

To our knowledge, this study is the first that simultaneously assessed the complex relationship between childhood trauma and self-harm with emotion regulation, dissociation, and BPD features using structural equation modeling. Current findings need to be interpreted in the light of several limitations. Main limitations are the cross-sectional correlational design and the use of self-reports. Due to this, we cannot establish directional relations and draw sound causal conclusions (Maxwell & Cole, 2007). Associations may be influenced by other variables, not assessed in this study. For instance, impulsivity has been critically implicated in self-harm (e.g., see Brickman et al., 2014; Lockwood et al., 2017; McHugh et al., 2019). Since the subscale of the PAI-BOR mostly assesses negative urgency, i.e., the drive to escape negative affect by using impulsive coping attempts, impulsivity was not thoroughly assessed in our study. While our model was based on theoretical assumptions and previous prospective findings, the direction of effects remains unclear and associations may be bidirectional. Thus, prospective designs are needed to corroborate our findings. Self-reports generally involve the risk of conscious or unconscious response biases, e.g., due to a lack of awareness, minimizing, or social desirability. This limitation especially concerns the retrospective assessment of childhood trauma. The sample described in this study is not a representative

community sample regarding age, education, or ethnicity. We recruited internationally via relevant online mental health platforms and included a higher percentage of people engaging in self-harm, which is a strength of this study. However, it is not clear if this reflects the frequency of self-harm found in the general population. Without further research, results cannot be generalized to clinical and general population samples. While around 20% of participants were seeking treatment and reported clinically relevant symptoms, they did not undergo diagnostic interviews to verify the presence or absence of a mental disorder. To gain more insight, future studies should include well-characterized patient groups, especially those with a diagnosis of BPD or complex post-traumatic stress disorder. In clinical populations, predictors of self-harm may be less specific due to a more pervasive pattern of overall psychosocial disturbances.

Despite these limitations, our findings might stimulate future research, as the better understanding of self-harm has important clinical implications. Careful screening for childhood trauma histories, emotion regulation problems, trait dissociation, and BP features can be an important step to detect vulnerable risk groups in different settings (Liu et al., 2018; Reichl & Kaess, 2021). A stepped-care model might be helpful to ensure adequate care based on the levels of severity. People displaying self-harm and milder symptoms may benefit from generalist-provided psychoeducation and problem-solving skills, while those with more severe and persistent symptoms, who also show substantial psychosocial impairment, should be referred to intensive specialized psychosocial treatment, especially if this concerns symptoms of BPD (Bohus et al., 2021). It may also be helpful to involve family members and to provide them with additional support (Bailey & Grenyer, 2014).

Future studies should acknowledge the multi-faceted nature of impulsivity, by investigating other facets such as delay discounting, inhibition, and attentional alterations (Stahl et al., 2014). Future research should also investigate the influence of other variables, not assessed in this study, such as alexithymia, increased hyperarousal, and other psychopathologies (e.g., depression, anxiety, post-traumatic distress) (Brown et al., 2018). To shed more light on the contextual factors of self-harm future, studies should include additional methods, such as ecological momentary assessments.

Conclusion

In conclusion, our findings provide evidence for close associations between childhood trauma, BP features, maladaptive emotion regulation, dissociation, and self-harm. While these findings need to be corroborated by prospective research with larger samples, they may add to a better understanding of psychological mechanisms underlying self-harming behavior. Ultimately, this knowledge will help to improve prevention and intervention.

Disclosure statement

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