



Dysfunctional posttraumatic cognitions as a mediator of symptom reduction in Trauma-Focused Cognitive Behavioral Therapy with children and adolescents: Results of a randomized controlled trial



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ABSTRACT

Objective: To investigate whether the change in dysfunctional posttraumatic cognitions (PTC) during Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) is a mediator of posttraumatic stress symptom (PTSS) reduction in a sample of children and adolescents.

Method: A bootstrap mediation analysis was performed to investigate the indirect effect of dysfunctional PTC on treatment outcome in a recently completed RCT study with children and adolescents ($n = 123$; 7–17 years old) that investigated the effectiveness of TF-CBT.

Results: The mediation model revealed that changes in dysfunctional PTC mediated the relationship between the group (TF-CBT vs. waitlist) and PTSS at the end of treatment.

Conclusion: Change in dysfunctional PTC is an important mechanism mediating the reduction of PTSS in TF-CBT. Monitoring dysfunctional PTC throughout treatment might, therefore, be an important factor in optimizing treatment outcome.

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1. Background

How does trauma therapy actually work? Several protocols of trauma-focused therapy have proven to be effective in reducing childhood posttraumatic stress symptoms (PTSS) that emerge after experiencing one or multiple traumatic event(s). They all share the common ground of taking cognitive processes into account. Therefore, not only cognitive behavioral therapy approaches, but also other techniques in the trauma-therapy field such as Prolonged Exposure (Foa, Chrestman, & Gilboa-Schechtman, 2009) or Eye Movement Desensitization and Reprocessing (Shapiro, 1995)

identified dysfunctional posttraumatic cognitions (PTC) as a key mechanism for recovery from PTSD. Dysfunctional PTC develop in the aftermath of trauma and comprise negative perceptions about oneself, others, the future and the entire world, such as “The world is a scary place where I am highly vulnerable” (Meiser-Stedman, Smith et al., 2009). They are thought to be not only a risk factor for the development, but also for the maintenance of PTSS, not only for adults (Dunmore, Clark, & Ehlers, 1999; Ehlers & Clark, 2000; Ehlers, Mayou, & Bryant, 2003), but also for children and adolescents (Meiser-Stedman, Dalgleish, Glucksman, Yule, & Smith, 2009). Dunmore et al. (1999) argue that dysfunctional PTC hereby generate a sense of ongoing threat and further affect the nature of the traumatic memory. In fact, research showed that dysfunctional PTC were the strongest predictor for acute stress symptoms (Salmon, Sinclair, & Bryant, 2007; Salmond et al., 2011) and PTSS (Bryant, Salmon, Sinclair, & Davidson, 2007) in children and adolescents. Dysfunctional PTC were further identified as mediators of initial and later PTSS within a sample of child and adolescent survivors of road traffic accidents and physical abuse (Meiser-Stedman, Dalgleish, et al., 2009). However, these findings could not be replicated by studies with war-affected children, in which dysfunctional PTC did not mediate the relationship between initial

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and later PTSS. However, dysfunctional PTC predicted later levels in PTSS as well as a change in PTSS (Palosaari, Punamaki, Diab, & Qouta, 2013).

Despite the relevance, however, only a few studies have investigated the association between cognitions and PTSS in the therapeutic context so far. Kleim et al. (2013) investigated this association in adult patients with PTSD who received cognitive therapy. They found not only that PTSS and dysfunctional PTC decreased during the treatment, but also that the changes were correlated and that the change in dysfunctional PTC significantly predicted subsequent symptom reduction.

Zalta et al. (2014) found similar results for adult patients with PTSD treated with Prolonged Exposure therapy (PE; $N = 64$), a therapy which doesn't specifically emphasize cognitive restructuring. To date, only few studies have examined this cognitive mediation hypothesis among adolescents receiving trauma-focused treatment (McLean, Yeh, Rosenfield, & Foa, 2015; Smith et al., 2007; Meiser-Stedman et al., 2017). The secondary analysis of a randomized controlled trial (RCT) comparing cognitive behavioral therapy (CBT) to a waitlist condition in a sample of children and adolescents experiencing single-incident traumatic events ($N = 24$) revealed that the effects of CBT were partially mediated by dysfunctional PTC (Smith et al., 2007). A recent RCT study (cognitive therapy for PTSD [CT-PTSD; $n = 14$] vs. waitlist [$n = 15$]) by Meiser-Stedman and colleagues (2017) yielded similar results: The treatment response was next to memory quality (measured by the Trauma Memory Quality Questionnaire; Meiser-Stedman, Smith, Yule, & Dalgleish, 2007), safety-seeking behaviors and rumination (Meiser-Stedman et al., 2014), mediated though pre-post changes in trauma-related misappraisals (measured by the Child Posttraumatic Cognitions Inventory; CPTCI; Meiser-Stedman, Dalgleish, et al., 2009; Meiser-Stedman, Smith et al., 2009). Furthermore, McLean et al. (2015) found in a sample of sexually assaulted female adolescents ($N = 61$) that the change in dysfunctional PTC mediated the change in PTSS when receiving PE rather than when receiving Client-centered therapy (CCT). They, therefore, concluded that a change in cognitions is a core mechanism of symptom reduction in PE therapy. However, all the relevant studies command relatively small sample sizes. Consequently, the question arises whether this change mechanism is therapy-specific or whether it works in various trauma-focused treatments.

In the childhood PTSD literature, especially Trauma-focused Cognitive Behavior Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006), an evidence-based multi-modal treatment developed for children and adolescents suffering from PTSD, has been shown to be effective in reducing PTSD symptom severity (Cary & McMillen, 2012; Morina, Koerssen, & Pollet, 2016) as well as in reducing dysfunctional PTC (Goldbeck, Muche, Sachser, Tutus, & Rosner, 2016; de Arellano et al., 2014). There is a strong focus in TF-CBT on challenging and shifting dysfunctional PTC. Thus, we suggest that the cognition hypothesis can be applied to this therapy since cognitive restructuring (identification and challenging of dysfunctional PTC as well as developing and establishing functional alternative cognitions) is actually part of the treatment model (Cohen et al., 2006).

Thus, the first aim of this study was to determine whether the previous findings on the relationship between change in dysfunctional PTC and PTSS reduction (based on DSM-IV (American Psychiatric Association, 1994) criteria which exclude dysfunctional PTC) extend to TF-CBT in a large sample of children and adolescents. The second aim was to investigate whether the change in dysfunctional PTC is also a mechanism in spontaneous remission (waitlist condition) or if it is treatment-specific. Based on the findings from children with CT-PTSD and PE literature, we hypothesize that the effect of allocation (TF-CBT vs. waitlist) on PTSS

at posttreatment is mediated through change in dysfunctional PTC.

2. Methods

2.1. Participants and procedure

This study builds on an original single-blind stratified (by severity of PTSS) parallel-group RCT in eight German child and adolescent mental health clinics, in which 159 children and adolescents were recruited between February 2012 and January 2015. Main inclusion criteria for participation were age 7–17, exposure to one or more traumatic events and at least medium severity of PTSS (total CAPS-CA score of ≥ 35). Participants were randomly assigned to either TF-CBT or to a waitlist condition (Goldbeck et al., 2016). All participants as well as their legal guardians gave their informed written consent. The study received ethics approval from the IRB at the Ulm University (#12/08 and #192/13) and was registered under ClinicalTrials.gov (NCT01516827). Only completer data (at least 8 sessions of TF-CBT) was taken into account for the analysis. Data on the relevant measures for the current study were available before and after therapy for $N = 124$ participants (see Flow Chart). To avoid inappropriate distortion of results, one case was removed as a multivariate outlier. More details about the exclusion of outliers are provided in the statistical analysis section. Hence, $N = 123$ cases make up the final sample with $n = 54$ participants ($n = 39$ female, $M_{age} = 12.80$ $SD_{age} = 2.79$) of TF-CBT and $n = 69$ participants ($n = 51$ female, $M_{age} = 13.23$ $SD_{age} = 2.75$) who were allocated to waitlist condition (see Table 1). There were no significant differences in socio-demographic characteristics, trauma type and pretreatment PTSS and CPTCI between the participants included in this analysis and the ones excluded.

TF-CBT is a short-term, component-based and manualized trauma-focused intervention (Cohen et al., 2006). TF-CBT integrates cognitive, behavioral, interpersonal, and family therapy principles and consists of three treatment phases: stabilization and skills building (sessions 1–4), exposure and cognitive processing of the trauma (sessions 5–8), and fostering safety and future development (sessions 9–12). A format of 12 weekly 90-min parallel or conjoint sessions with patients and caregivers was delivered, within a period of about 4 months. In this study sub-sample, $n = 49$ patients (91%) completed the full format of 12 sessions and $n = 53$ patients (98%) completed at least 8 sessions including the trauma narrative. Hence, participants in the TF-CBT condition received on average 11.87 ($SD = 1.15$) sessions. The 26 study therapists (mean age 37.4 years) were trained by approved trainers of TF-CBT. The overall treatment fidelity was rated as high with 96% of the evaluated sessions classified as adherent with the treatment manual. A detailed description of the RCT and TF-CBT treatment can be found elsewhere (Goldbeck et al., 2016).

2.2. Measures

Dysfunctional PTC related to the child's trauma were assessed via self-report with the German version of the Child Posttraumatic Cognitions Inventory (CPTCI; de Haan, Petermann, Meiser-Stedman, & Goldbeck, 2016). The CPTCI consists of 25 items measuring dysfunctional PTC which are evaluated on a 4-point rating scale ranging from 1 ("Don't agree at all") to 4 ("Agree a lot"). The total score ranges from 25 to 100. The internal reliability in the RCT study was acceptable indicated by Cronbach's α of 0.92 (Goldbeck et al., 2016). The correlation between the subscales "fragile person in a scary world" and "permanent and disturbing change" was throughout highly significant in our sample, not only pre-intervention ($r = 0.769$, $p < 0.000$), but also post-intervention ($r = 0.870$, $p < 0.000$) and for the change variables from pre- to

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