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A Randomized Controlled Trial of Cognitive-Behavior Therapy for Cambodian Refugees With Treatment-Resistant PTSD and Panic Attacks: A Cross-Over Design

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We examined the therapeutic efficacy of a culturally adapted cognitive-behavior therapy for Cambodian refugees with treatment-resistant posttraumatic stress disorder (PTSD) and comordid panic attacks. We used a cross-over design, with 20 patients in the initial treatment (IT) condition and 20 in delayed treatment (DT). Repeated measures MANOVA, Group & times; Time ANOVAs, and planned contrasts indicated significantly greater improvement in the IT condition, with large effect sizes (Cohen's *d*) for all outcome measures: Anxiety Sensitivity Index ($d = 3.78$), Clinician-Administered PTSD Scale ($d = 2.17$), and Symptom Checklist 90-R subscales ($d = 2.77$). Likewise, the severity of (culturally related) neck-focused and orthostasis-cued panic attacks, including flashbacks associated with these subtypes, improved across treatment.

Although there is good evidence for the efficacy of cognitive-behavior therapy (CBT; e.g., Foa, Dancu, et al., 1999; Resick, Nishith, Weaver, Astin, & Feuer, 2002) for PTSD arising from stressors such as sexual and non-sexual assault, automobile or industrial accidents, or natural disasters (for effect-size reviews, see Foa, Keane, & Friedman, 1999; Otto, Penava, Pollack, & Smoller, 1996; Van Etten & Taylor, 1998), little data exist to guide the treatment of posttraumatic stress disorder (PTSD) among traumatized refugees (for a review, see Nicholl & Thompson, 2004). Refugees often have extremely severe symptoms, resulting from various traumas: starvation, exposure to bombing, viewing corpses, harassment, severe illness, and torture. To our knowledge, only four randomized controlled studies have been conducted to date. In a mixed group of refugees, Paunovic and Öst (2001) compared the efficacy of CBT ($n = 7$) and exposure therapy ($n = 9$), demonstrating both treatments to result in impressive treatment gains on all measures. In a group of Sudanese refugees, Neuner, Schauer, Klaschik, Karunkara, and Elbert (2004) compared narrative exposure therapy ($n = 17$), supportive counseling ($n = 14$), and psychoeducation ($n = 12$), finding narrative exposure therapy to be the most efficacious, with improvement on all measures. The other two controlled studies, both with Southeast Asian refugees, were conducted by our group (Hinton, Pham, et al., 2004; Otto et al., 2003; discussed later).

A number of investigators have suggested that CBT may be a particularly useful therapeutic modality for Southeast Asian refugees owing to the similarity of Buddhist principles to core aspects of CBT (Beiser, 1987; Bemak, Chung, & Bornemann, 1996; Boehnlein, 1987). Buddhist-type mindfulness is increasingly being utilized

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by CBT therapists in treatment protocols, and appears to be efficacious (Linehan, 1993; Roemer & Orsillo, 2002; Teasdale, 1999a, 1999b). In addition, traumatized Southeast Asian refugees have high rates of panic disorder (PD; Hinton, Ba, Peou, & Um, 2000; Hinton, Chau, et al., 2001), a disorder for which CBT is especially effective (Deacon & Abramowitz, 2004). Consequently, based on our preliminary studies of trauma-related disorder among Cambodian (e.g., Hinton et al., 2000; Hinton, Um, & Ba, 2001) and Vietnamese (e.g., Hinton, Chau, et al., 2001; Hinton, Pham, Chau, Trau, & Hinton, 2003) refugees, we attempted to develop a culturally appropriate treatment for PTSD and comorbid panic attacks. In the first study, with Cambodian refugees, we (Otto et al., 2003) compared the efficacy of CBT ($n = 5$) to treatment with supportive psychotherapy and a serotonin-reuptake blocker ($n = 5$). CBT resulted in greater improvement, as reflected in between-group effect sizes (for the PTSD measure, Cohen's $d = 0.71$). In the next study (i.e., the second generation of the manual-based protocol), with Vietnamese refugees, we (Hinton, Pham, et al., 2004) compared the efficacy of CBT ($n = 6$) to continuation of treatment with supportive therapy and medication ($n = 6$). CBT resulted in greater improvement, as reflected in between-group effect sizes (for the PTSD measure, Cohen's $d = 2.5$).

Traumatization of Cambodian Refugees

During Khmer Rouge rule (i.e., 1975–1979), 1 to 3 million of Cambodia's 7 million people died (Chung, 2001; Kiernan, 1996). Cambodians were subjected to slave labor, physical and sexual violence, and the constant threat of death by illness, starvation, or execution (see Mollica, Mcinness, Poole, & Tor, 1998). Upon leaving the country, Cambodians passed through the hardship of a long stay in chaotic and dangerous refugee camps (Chung, 2001). By 1998, approximately 130,000 Cambodian refugees had resettled in the United States (Pfeiffer, 2000). In the United States, Cambodians, without knowledge of the local culture or language, had to adjust to urban environments of poverty and violence.

Trauma-Related Disorder Among Cambodian Refugees

Cambodian refugees attending psychiatric clinics have high rates of PTSD (50%; Mollica, Wyshak, & Lavelle, 1987) and PD (60%; Hinton et al., 2000). In addition, they often experience two types of culturally specific panic attacks. In one study (Hinton, Chhean, et al., in press), 44% of patients surveyed at a psychiatric clinic had at least one episode of neck-focused panic in the previous 4 weeks. In another study, 36% of the patients surveyed at a psychiatric clinic had orthostatically triggered panic in the previous 4 weeks (Hinton, Pollack, Pich, Fama, & Barlow, 2005). In both studies, culturally specific panic attacks (i.e., either neck-focused or orthostatically triggered) were highly associated with psychopathology.

In a neck-focused panic attack, a Cambodian worries about neck vessel rupture and has multiple autonomic arousal symptoms: dizziness, blurry vision, and palpitations (Hinton, Um, & Ba, 2001). In an orthostasis-triggered panic attack, a Cambodian stands and experiences dizziness along with other symptoms (e.g., palpitations); the patient, fearing syncope, sits down (Hinton, Pich, et al., 2004). These two types of somatically focused panic attacks, which maintain high levels of arousal and distress, constitute a key target of therapeutic intervention (Hinton, Um, & Ba, 2001; Hinton, Pich, et al., 2004).

The Generation of Neck and Orthostatic Panic: The "TCMIE" Model

In neck-focused panic, the first symptom is usually neck tension, often triggered by a generalized anxiety disorder-type worry episode; in orthostasis-associated panic, the first symptom is typically orthostasis-induced dizziness, caused by such processes as anticipatory-anxiety mediated effects on (a) somatic scanning and (b) blood-pressure and vestibular adjustment to orthostasis (see Furman & Jacob, 2001; Hinton, Pich, et al., 2004). Next, the sensation (e.g., worry-induced neck tension or orthostasis-induced dizziness) may activate four types of fear networks: *trauma associations* (T) (e.g., dizziness may activate a dizziness-encoded trauma event, which then results flashback and autonomic arousal constituting a panic attack); *catastrophic cognitions* (C) (i.e., worry that the symptom indicates imminent death from bodily dysfunction or from insanity); *metaphoric associations* (M) (e.g., many Cambodian expressions for conveying distress utilize spinning metaphors, so that dizziness may evoke current life distress, such as financial problems or a child's gang involvement); and *interoceptive conditioning directly to fear and arousal-reactive sensations* (I) (e.g., repeated trauma- or catastrophic cognitions-related panic attacks may lead to this type of conditioning). Activation of fear networks intensifies the symptom (e.g., neck tension or dizziness) as well as inducing other arousal-reactive symptoms (e.g., palpitations). Subsequently, the newly augmented arousal-reactive sensation as well as other newly induced sensations further activate the four types of fear networks (cf. Clark, 1986). If all

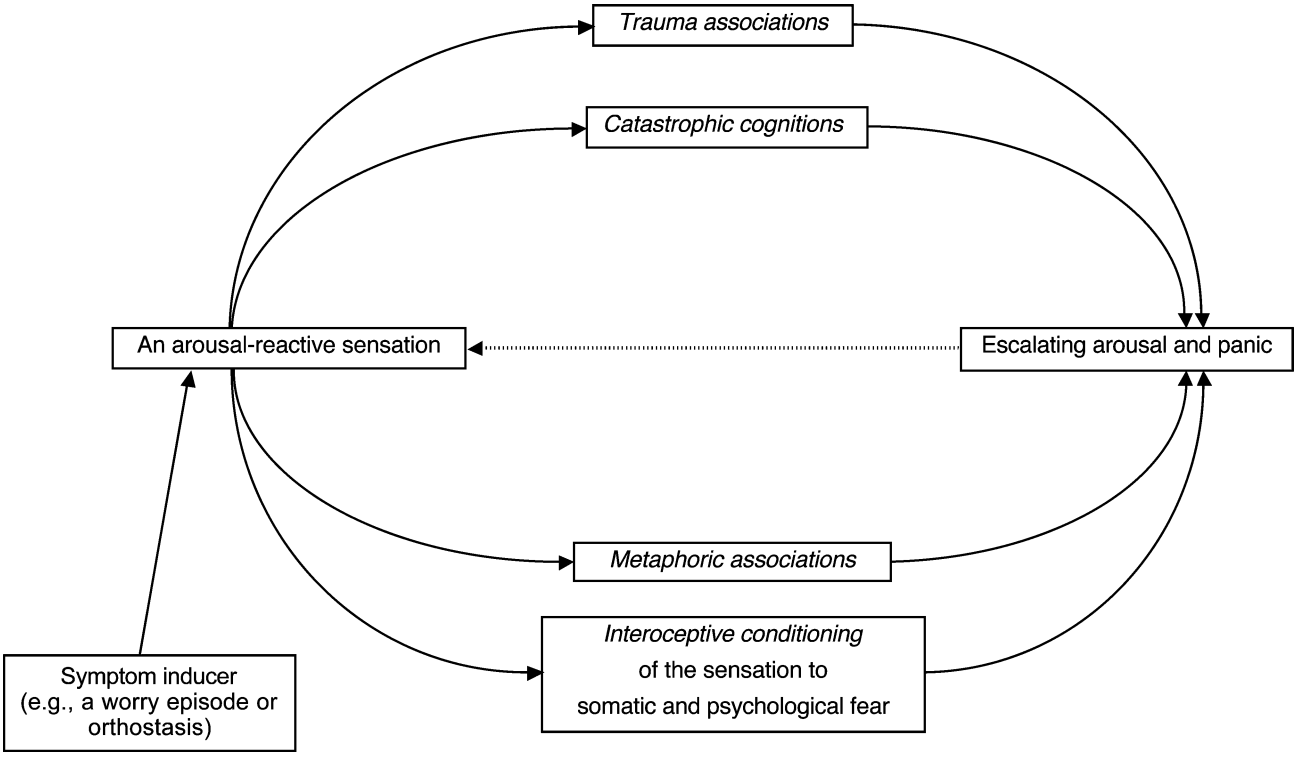

Fig. 1. The generation of a TCMIE panic attack (T = trauma associations, C = catastrophic cognitions, M = metaphoric resonances, I = interoceptive conditioning of sensations to psychological and somatic fear, and E = escalating arousal and panic).

four types of fear networks become activated and generate a panic attack, we refer to it as a "TCMIE" panic attack, with "E" meaning "escalating arousal and panic" (see Fig. 1) (for further discussion of the TCMIE model and its components, see Hinton, Chhean, et al., in press; Hinton, Pich, et al., 2004; Hinton, Pollack, et al., 2005).

Hypotheses

An initial study by our group, based on the TCMIE model of panic generation, demonstrated the efficacy of a CBT protocol that included panic control elements (Barlow & Craske, 1994) for the treatment of the Cambodians with PTSD (Otto et al., 2003). Another study, using a modified and expanded version of the protocol, demonstrated efficacy for the treatment of Vietnamese with PTSD and comorbid headache and orthostatic panic (Hinton, Pham, et al., 2004). We hypothesized that the third generation of the manual-based protocol would be effective in the treatment of Cambodian refugees with PTSD and comorbid panic attacks, decreasing fear of anxiety-related somatic sensations, PTSD severity, neck- and orthostasis-associated panic attacks, neck and orthostasis panic-associated flashbacks, anxiety and depression-related distress, and the frequency of PTSD and generalized anxiety disorder (GAD). We consider GAD to be a key diagnosis to assess and treat in this population because GAD-type worry episodes often result in arousal symptoms (e.g., muscular tension in the neck) that trigger panic attacks (cf. Wells, 2000, p. 160).

Method

Participants

Participants attended a community-based outpatient clinic that provides specialized services to Cambodian refugees. We offered CBT treatment to Cambodian patients who were considered to be treatment resistant. Inclusion criteria were (a) having passed through the Cambodian genocide (1975–1979), (b) having been at least 6 years of age at the beginning of the genocide, and (c) being treatment resistant; that is, still meeting PTSD criteria (as assessed by the SCID module for PTSD; First, Spitzer, & Gibbon, 1995) despite receiving supportive counseling and an adequate trial of a selective serotonin reuptake inhibitor (SSRI) (i.e., at least 1 year on the

Table 1. Demographic and Acculturation as a Function of Treatment Condition

Variable	IT Patients ($n = 20$)	DT Patients ($n = 20$)	χ^2 (1) or t(38)
Female gender (%)	60%	60%	0.00
Age	50.90 (6.11)	52.70 (7.43)	0.85
Years of education	2.68 (1.84)	3.25 (2.12)	1.03
Years in United States	16.95 (3.60)	17.50 (3.53)	0.48
Fluency in written English (%)	0%	0%	0.00
Fluency in spoken English (%)	0%	0%	0.00
Active Buddhist (%)	100%	100%	0.00

Note. Chi-square test used for variables involving percentage; t test for all other variables. IT = immediate treatment; DT = delayed treatment. Years of education = time studying in Cambodia, in refugee camps, and when a monk (Cambodians males often become a monk for a few years and study at that time). Fluency in spoken English = an ability to communicate in a medication session without need of translation. Fluency in written English = an ability to read an English newspaper. An active Buddhist = someone self-identified as Buddhist who also visits the temple at least once a year to attend or participate in a ceremony.

maximally tolerated dosage). Exclusion criteria included (a) inability to give informed consent and (b) psychosis in the last year. We recruited patients considered most treatment resistant. No payment was given for participation. Patients were randomly assigned to either the Immediate Treatment (IT) or the Delayed Treatment (DT) Group (see Table 1 for a comparison of the IT and DT Groups in terms of gender, age, years of education, years living in the United States, language facility, and religion). All participating patients had current (in the last month) neck-focused and orthostasis-triggered panic attacks, and all had current (in the last month) flashbacks during both types of panic attacks. The study was approved by the institutional Internal Review Board. The patients gave informed consent after a full explanation of the procedures. Four eligible patients declined to participate because of time and transportation constraints. All randomized patients completed the study, and there were no missing data.

Measures

All measures were translated and then back-translated, as per the standard procedure (Mollica, Wyshak, de Marneffe, Khuon, & Lavelle, 1987).

Anxiety Sensitivity Index (ASI; Taylor, Koch, & McNally, 1992)

The 16-item ASI rates, on 0 to 4 Likert-type scales, the degree of fear of anxiety-related sensations and thought processes. In PD patients, the mean score is about 2.3 per item (Taylor et al., 1992) whereas among nonclinical samples, approximately 1.2 (Peterson & Reiss, 1992). The ASI differentiates between patients with and without PD, and it has been shown to be an important predictor of PTSD chronicity (e.g., Taylor, 2003). With 20 Cambodian patients, we assessed the ASI's test-retest reliability (at 2 weeks: $r = .89$). We also assessed the scale's Cronbach's α (.89).

Clinician-Administered PTSD Scale (CAPS; Weathers, Keane, & Davidson et al., 2001)

The CAPS rates, on 0 to 4 Likert-type scales, the frequency and intensity of each of the 17 *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*; American Psychiatric Association, 1994) based PTSD symptoms. Scores range from 0 to 136. Weathers et al. (2001) suggested the following score categories: 0–19 = asymptomatic/few symptoms, 20–39 = mild PTSD/subthreshod, 40–59 = moderate PTSD/threshold, 60–79 = severe PTSD symptomatology, and >80 = extreme PTSD symptomatology. Weathers et al. suggested that a 15-point change in CAPS total severity indicates clinically significant change. With 20 Cambodian patients, we assessed both the CAPS's interrater ($r = .92$) and test-retest (at 1 week: $r = .84$) reliabilities.

Neck Panic Attack Severity Scale (N-PASS) and Orthostatic Panic Attack Severity Scale (O-PASS)

We utilized a Panic Attack Severity Scale (PASS) to assess severity of neck-focused and orthostatic-triggered panic attacks (N-PASS and O-PASS, respectively). The PASS profiles the severity of panic on three dimensions (cf. Bandelow, 1999; Shear et al., 1997), each scored on a 0 to 4 Likert-type scale: (a) frequency, (b) length, and (c) degree of distress. With 30 patients, we determined the N-PASS's and O-PASS's interrater (Pearson rs = .95 and .97, respectively) and test-retest (at 1 week: rs = .86 and .88, respectively) reliabilities.

Neck-Panic Flashback Severity Scale (N-FSS) and Orthostatic-Panic Flashback Severity Scale (O-FSS)

We used a Flashback Severity Scale (FSS) to assess the severity of flashbacks associated with both neck-focused and orthostatic-induced panic (N-FSS and O-FSS, respectively) (cf. Hackmann, Ehlers, Speckens, & Clark, 2004). The FSS measures flashback severity on the following three dimensions, each rated on a 0 to 4 Likert-type scale: (a) degree of dissociation, (b) length, and (c) degree of distress. To assess degree of dissociation, the FSS includes the CAPS's Flashback Intensity Scale (Weathers et al., 2001): 0 (*no reliving*), 1 (*mild, somewhat more realistic than just thinking about the event*),

2 (*moderate, definite but transient dissociative quality, still very aware of surroundings, daydreaming quality*), 3 [*severe, strongly dissociative (reports images, sounds, or smells but retained some awareness of surroundings)*], and 4 [*extreme, complete dissociation (flashback), no awareness of surroundings, may be unresponsive, possible amnesia for the episode (blackout)*]. To assess length, the FSS includes the following 0 to 4 Likert-type scale: 0 (*none*), 1 (*less than 1 minute*), 2 (*less than 5 minutes*), 3 (*less than 10 minutes*), and 4 (*10 minutes or more*). To assess degree of distress, the FSS includes the following 0 to 4 Likert-type scale: 0 (*mild*), 1 (*moderate*), 3 (*severe*), and 4 (*very severe*). With 20 patients, we assessed the N-FSS's and O-FSS's interrater (rs = .93 and .95, respectively) and test-retest (at 1 week: rs = .89 and .92, respectively) reliabilities.

Symptom Checklist-90-R (SCL; Derogatis, 1994) Scales

The SCL measures general psychiatric distress on several dimensions of pathology, each item measured on a 0 to 4 Likert-type scale. Studies have suggested that the SCL scales have much shared variance (Pedersen & Karterud, 2004). For the present study, two subscales were used: Anxiety (10 items) and Depression (13 items). We used the composite score of the Anxiety (10 items) and Depression scales (13 items). With 20 Cambodian patients, we assessed the composite score's test-retest reliability (at 2 weeks: $r = .88$). We also assessed the composite scale's Cronbach's α (.91).

PTSD Status

To determine the rate of PTSD, using the CAPS, we used the "rule of 3;" that is, for a symptom to be counted as present, the severity and frequency score had to be a 3 or greater (Blanchard et al., 2004). As assessed with 20 patients, we found "the rule of 3" designation to coincide well with a Cambodian-speaking psychiatrist's determination as guided by the SCID module for PTSD (First et al., 1995) ($\kappa = .89$).

GAD Status

To assess for GAD, we utilized the SCID module. As assessed with 20 patients, the GAD module demonstrated good interrater reliability ($\kappa = .93$).

Procedure

We used a repeated measures, cross-over design. Eligible patients who agreed to participate were stratified by gender, with random allocation to either the IT or the DT Group decided by a coin toss. All patients continued supportive psychotherapy, which consisted of a meeting with a social worker every 2 weeks, and medications, which consisted in all cases of a combination of an SSRI and the benzodiazepine clonazepam. All participants completed assessments of the ASI, CAPS, SCL, and GAD status at four time points: (a) pretreatment (first assessment), (b) after the IT Group had undergone 12 sessions of CBT (second assessment), (c) after the DT Group had undergone 12 sessions of CBT (third assessment), and (d) for both groups, 12 weeks after the completion of therapy (follow-up assessment). At 4-week intervals, we assessed the severity of neck- and orthostasis-associated panic (N-PASS and O-PASS), as well as neck- and orthostasis-panic-associated flashbacks (N-FSS and O-FSS), starting 4 weeks prior to the IT Group's treatment and continuing until completion of the DT Group's treatment. Blind to treatment condition, all assessments were made by a Cambodian bicultural worker (D.C., V.P.) with over 2 years of mental health experience.

Treatment

The first author (D.H.), who is fluent in Cambodian, conducted the CBT sessions, utilizing a manual-based protocol developed by the first author (cf. Hinton, Pham, et al., 2004). Individual CBT was offered across 12 weekly sessions. During CBT, we stressed 10 core elements (for further discussion, see the special issue of *Cognitive and Behavioral Practice*, "Culturally Sensitive CBT"; Hinton, in press):

(1) providing information about the nature of PTSD and PD (Falsetti & Resnick, 2000; Resick & Schnicke, 1993), such as introducing the TCMIE model of panic generation to teach how trauma reminders, catastrophic cognitions, metaphoric associations, and interoceptive conditioning generate panic attacks;
(2) muscle relaxation and diaphragmatic breathing procedures, including the use of applied relaxation techniques (Öst & Breitholtz, 2000; Öst & Westling, 1995);
(3) performing a culturally appropriate visualization (cf. Foa & Rothbaum, 1998)—a lotus bloom that spins in the wind at the end of a stem (an image encoding key Asian cultural values of flexibility; see Hinton, 2000)—while enacting analogous rotational movements at the neck after each relaxation of the neck and head musculature

(These rotational movements also serve as an introduction to dizziness interoceptive exercises);

(4) framing relaxation techniques as a form of mindfulness (Borkovec, 2002), that is, as an attentive focusing upon specific sensory modalities (e.g., muscular tension and the kinesthetics of breathing);

(5) cognitive restructuring of fear networks, especially trauma memory associations to and catastrophic misinterpretations of somatic sensations (Clark & Ehlers, 2004; Foa & Rothbaum, 1998; Resick & Schnicke, 1993);

(6) interoceptive exposure to anxiety-related sensations, in conjunction with re-association to positive images, to treat panic attacks generated by sensation-activated fear networks such as trauma associations, catastrophic cognitions, metaphoric associations, and interoceptive conditioning (Falsetti & Resnick, 2000; Hinton, Pham, et al., 2004; Otto et al., 1996);

(7) providing an emotional-processing protocol (Foa & Rothbaum, 1998; Rachman, 1980) to utilize during times of trauma recall, the protocol bringing about a shift from an attitude of pained acceptance to one of mindfulness (i.e., multisensorial awareness of the present moment);

(8) exploring neck and orthostatic panic, as in firing sequences—for example, the sensations, activities, and thoughts that initiate the sequence leading to panic—and associated trauma associations and catastrophic cognitions (see Hinton, Pich, et al., 2004; Hinton, Um, & Ba, 2001; cf. Clark, 2004; Falsetti & Resnick, 2000);

(9) exposure to (Foa & Rothbaum, 1998) and narrativization of (Brewin, Dalgleish, & Joseph, 1996; Clark & Ehlers, 2004) trauma-related memories—most particularly, those associated with panic attacks and nightmares—by having the patient describe the event in detail, including sensory elements (but without repeated exposure, unless the same flashback recurs); and

(10) teaching cognitive flexibility by (a) the lotus visualization and enactment; (b) a flexibility protocol; (c) practice in state shifting, or set shifting, during the emotional-processing protocol, which entails shifting from acknowledgment of the trauma event's occurrence, to self and other pity, to loving kindness, and to mindfulness; and (d) practice in state shifting, or set shifting, within the mindfulness component, by shifting from one sensory modality to another. (Cognitive flexibility is a key metacognitive skill that decreases in such disorders as depression, rumination, and general anxiety disorder; see Ashby, Isen, & Turken, 1999; Davis & Nolen-Hoeksema, 2000; Fossati, Ergis, & Allilaire, 2001; Roemer, 1997; cf. Well's research—for a review, see Wells & Papageorgiou, 2004—showing that what he calls a *metacognitive mode* [vs. an *object mode*], i.e., an awareness of, and ability to shift between, different ways of viewing a situation, is highly protective of various psychopathologies, especially anxious- and depressive-type rumination. Increasing, it is thought that CBT should modify not only thought contents but also thought processes, such as aiming to increase cognitive flexibility [Barlow, Allen, & Choate, 2004; Borkovec, Newman, & Castonguay, 2003; Lackner & Quigley, 2005].)

Results

Table 2 provides symptom scores, including severity of panic attacks and associated flashbacks, for the four assessments. For both groups, none of the scores differed significantly at baseline. To illustrate the magnitude of treatment benefits relative to other studies, we computed between-group effect sizes, comparing the IT and DT Groups at the second assessment, using Cohen's d (cf. Sherman, 1998; Ehlers, Clark, Hackmann, McManus, & Fennell, 2005): $d = \text{Mean}_{\text{DT Group}} - \text{Mean}_{\text{IT Group}}/SD_{\text{pooled}})$, where $SD_{\text{pooled}} = \sqrt{[(SD_{\text{DT Group}}{}^2 + SD_{\text{IT Group}}{}^2)/2]}$ (for between-group effect sizes, see Table 2).

To evaluate the effects of treatment on symptom change, we conducted a 2 (Group: initial vs. delayed treatment) by 4 (Time: first, second, third, and follow-up assessment) repeated measures MANOVA with ASI, CAPS, N-PASS, O-PASS, N-FSS, O-FSS, and SCL scales as the seven dependent variables. The results showed a significant group effect, $F(7, 32) = 5.29$, $p < .001$, time effect, $F(21, 18) = 42.97$, $p < .001$, and Group by Time interaction, $F(21, 18) = 25.75$, $p < .001$. The Mauchley Sphericity test was significant for the ASI, CAPS, SCL, and N-PASS; however, a Greenhouse–Geisser correction did not change the results of any of these effects. Follow-up analyses of repeated measures ANOVAs showed that for all dependent variables, there was a significant time effect (Fs > 79.90, ps $< .001$), group effect (Fs > 8.40, $p < .01$), and Time by Group interaction

Table 2. Psychiatric Symptoms as a Function of Treatment and Time of Assessment

	First Assessment *M (SD)*	Second Assessment *M (SD)*	Third Assessment *M (SD)*	Follow-Up Assessment	Between = Group Effect Size Based on Second Assessment Cohen's *d*
ASI					
Immediate treatment	3.08 (0.61)	1.65 (0.45)	1.86 (0.32)	1.98 (0.40)	3.78
Delayed treatment	3.27 (0.53)	3.19 (0.36)	1.84 (0.42)	1.91 (0.49)	
CAPS					
Immediate treatment	74.85 (14.67)	39.25 (19.92)	41.30 (13.95)	44.59 (14.58)	2.17
Delayed treatment	75.91 (11.5)	73.05 (9.43)	45.05 (8.72)	43.56 (10.22)	
N-PASS					
Immediate treatment	7.85 (2.35)	2.15 (1.79)	2.61 (2.14)	2.41 (2.52)	2.22
Delayed treatment	6.81 (2.82)	6.05 (1.73)	2.32 (1.82)	2.44 (2.36)	
O-PASS					
Immediate treatment	8.17 (2.24)	2.53 (2.01)	2.43 (2.04)	2.31 (2.18)	2.82
Delayed treatment	7.77 (1.42)	7.42 (1.44)	2.45 (2.21)	3.01 (2.19)	
N-FSS					
Immediate treatment	10.45 (1.35)	2.93 (2.53)	2.91 (2.21)	3.1 (2.80)	3.49
Delayed treatment	10.71 (1.12)	10.35 (1.61)	3.10 (2.69)	2.96 (2.93)	
O-FSS					
Immediate treatment	10.82 (1.19)	4.22 (2.72)	2.95 (2.72)	3.18 (3.12)	2.35
Delayed treatment	10.00 (1.97)	9.45 (1.56)	3.04 (2.45)	3.15 (3.22)	
SCL scales					
Immediate treatment	2.92 (0.61)	1.72 (0.43)	1.77 (0.30)	2.02 (0.78)	2.77
Delayed treatment	3.02 (0.51)	2.94 (0.45)	2.03 (0.41)	1.96 (0.89)	

Note. $N = 40$. ASI = Anxiety Sensitivity Index; CAPS = Clinician-Administered PTSD Severity Scale; N-PASS = Neck Panic Attack Severity Scale; O-PASS = Orthostatic Panic Attack Severity Scale; N-FSS = Neck-Panic Flashback Severity Scale; O-FSS = Orthostatic-Panic Flashback Severity Scale; SCL scales = Average of the Symptom Checklist-90-R's Anxiety and Depression subscales.

(Fs > 17.38, ps $< .001$). To examine group differences in the various assessment points, we conducted unpaired t tests. The IT Group had significantly lower scores at the second assessment on the ASI, CAPS, O-PASS, O-FSS, N-PASS, N-FSS, and SCL scales (ts > 5.8, ps $< .001$). No group differences were observed on any of the outcome variables at the first, third, or follow-up assessment (ts < 1.4, *ns*).

As assessed at 4-week intervals, Fig. 2 shows (a) the severity of neck-focused panic attacks and neck panic flashbacks (N-PASS and N-FSS), and Fig. 3 shows (b) the severity of orthostatic-induced panic attacks and orthostatic panic flashbacks (O-PASS and O-FSS). As can be seen, both types of panic and associated flashbacks improved as a function of treatment.

The categorical data for PTSD and GAD were analyzed by 2×2 chi-squares to assess changes across treatment. Before treatment, all patients had PTSD. After the first course of CBT (second assessment), 12 (60%) IT patients no longer met PTSD criteria whereas all DT patients still did, $\chi^2(1, 40) = 17.14$, $p < .001$. Before treatment, all participating patients met GAD criteria. After the first course of treatment (second assessment), 11 (60%) IT patients no longer met GAD criteria whereas all DT patients did, $\chi^2(1, 40) = 15.17$, $p < .001$. Likewise, the DT Group improved across treatment, with, at the third assessment, 10 (50%) DT patients no longer having PTSD, $\chi^2(1, 20) = 13.33$, $p < .001$ and 9 (45%) DT patients no longer having GAD, $\chi^2(1, 40) = 11.61$, $p < .01$.

Discussion

In this study of traumatized Cambodian refugees, a culturally adapted CBT treatment focusing on PTSD and comorbid panic attacks was efficacious. Patients improved on all measures, including fear of anxiety-related somatic sensations (ASI), PTSD severity (CAPS), neck- and orthostasis-associated panic attacks (N-PASS and O-PASS), neck and orthostasis panic-associated flashbacks (N-PASS and O-PASS), anxiety and depression-related distress (SCL subscales), and diagnostic status (PTSD and GAD). Between-group comparisons indicated benefit over the waitlist condition on the order of very large effect sizes according to Cohen's standards (Cohen, 1988). The values compare well to the between-group effect sizes commonly found for CBT in nonrefugee populations. In one review, the average between-group effect size of psychosocial treatments was 0.52 (Sherman, 1998); in a recent study (Ehlers et al., 2005), a between-groups effect size of 2.18 was obtained for the CAPS score (for other effect-size reviews, see Foa, Keane, & Friedman, 1999;

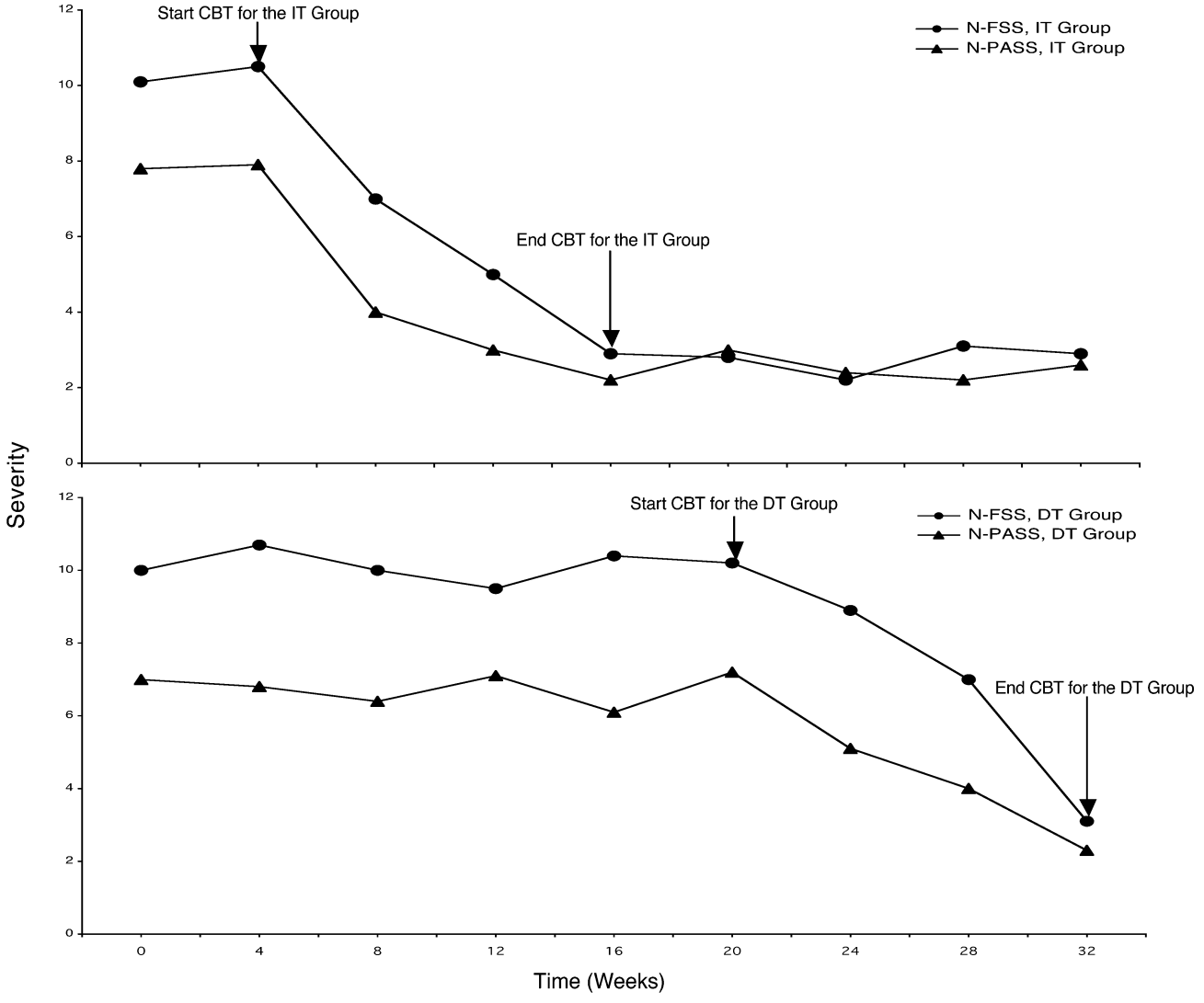

Fig. 2. Improvement of neck panic and neck panic-associated flashbacks in the Immediate Treatment (IT) and the Delayed Treatment (DT) groups as a function of cognitive-behavioral therapy (CBT) and time. Severity of neck panic is rated by the Neck Panic Attack Severity Scale (N-PASS), and severity of neck panic-associated flashbacks by the Neck-Panic Flashback Severity Scale (N-FSS). The IT group is shown in the upper graph, and the DT group is shown in the lower graph.

Otto et al., 1996; Van Etten & Taylor, 1998). The magnitude of treatment gains is especially important given that these patients had failed to respond to a regimen of medication (i.e., an SSRI and a benzodiazapine) and supportive psychotherapy. Thus, this study suggests CBT's utility for treating Cambodian refugees who do not respond to pharmacological treatment and supportive psychotherapy.

In a volume devoted to cross-cultural aspects of the effects of trauma (Marsella, Friedman, Gerrity, & Scurfield, 1996), several authors argued (a) that the *DSM-IV*-defined PTSD criteria may not represent the full spectrum of response to trauma across different cultural contexts and (b) that culture-specific reactions to trauma need to be elucidated (e.g., Kirmayer, 1996; Marsella, Friedman, & Spain, 1996). As asserted by Keane, Kaloupek, and Weathers (1996), there is not always *content equivalence* in the symptomatology of a trauma-related disorder in different cultural groups. That is, in trauma-related disorders, certain symptoms may be more salient in one culture as compared to another, or yet still, certain symptoms may be unique to that culture. Keane et al. (1996) referred to the research agenda

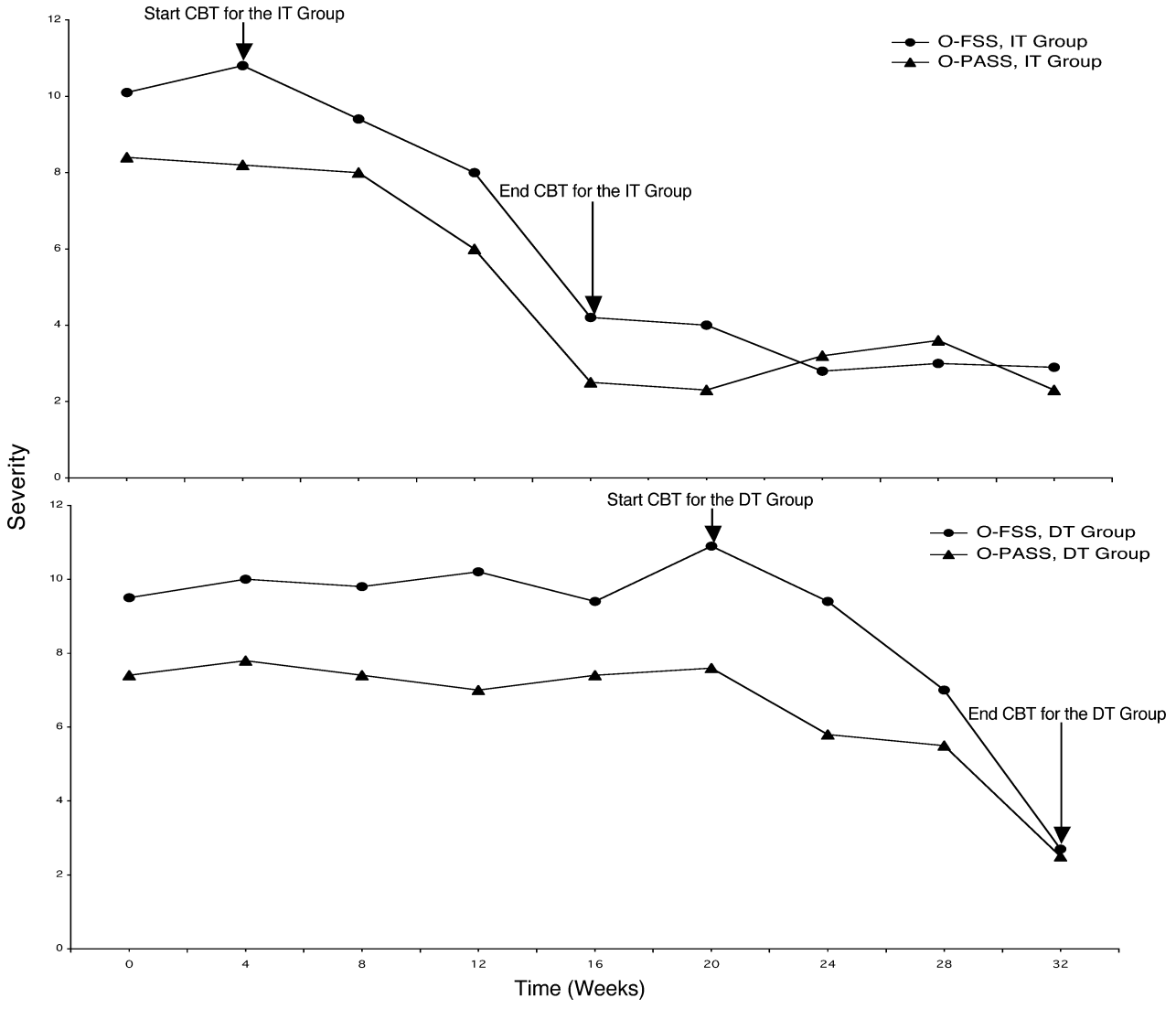

Fig. 3. Improvement of orthostatic panic and orthostatic panic-associated flashbacks in the Immediate Treatment (IT) and the Delayed Treatment (DT) groups as a function of cognitive-behavioral therapy (CBT) and time. Severity of orthostatic panic is rated by the Orthostatic Panic Attack Severity Scale (O-PASS), and severity of orthostatic panic-associated flashbacks by the Orthostatic-Panic Flashback Severity Scale (O-FSS). The IT group is shown in the upper graph, and the DT group is shown in the lower graph.

of delineating the full spectrum of symptoms associated with a trauma-related disorder in a particular culture as the search for *content validity*. Our study suggests that to provide culturally sensitive treatment, initially the clinician must identify the distress patterns of a particular group and the means by which those distress patterns are generated. Effective treatment in the present study followed from first identifying key distress patterns within the population (e.g., neck-focused and orthostasis-triggered panic), and how that distress is generated (e.g., the TCMIE model of panic generation).

The present study also highlighted the severity of flashbacks in the Cambodian group. The flashbacks were much more severe, prolonged, and elaborated than reported for other traumatized groups (cf. Ehlers et al., 2002; Hackmann et al., 2004). To give examples of flashback content, during neck-focused panic attacks, patients often had flashbacks of blows to the head, and of slave labor, when forced to carry heavy objects on the head and shoulders, causing neck soreness (for further discussion, see Hinton, Um, & Ba, 2001; Hinton, Chhean, et al., in press); and during orthostatic-triggered panic attacks,

patients often had flashbacks of fainting during periods of overwork, of extreme dizziness in malaria episodes, and of nausea and dizziness upon seeing bloated corpses and witnessing execution eviscerations (for further discussion, see Hinton, Pich, et al., 2004; Hinton, Pollack, et al., 2005).

Why do Cambodians still have such severe flashbacks of events that occurred over 25 years ago (i.e., from 1975–1979)? First, most Cambodians passed through multiple extremely severe traumas. Second, prolonged stress and repeated traumas, combined with severe starvation, as was experienced by the Cambodians during the 4 years of the Pol Pot period (1975–1979), may result in higher levels of corticotrophin-releasing factor and hence increased imprinting of memories into the amygdala (Rainnie et al., 2004). Third, if a patient considers flashbacks to have negative mental or physical consequences, then the flashbacks will be more likely to worsen psychological status and less likely to be extinguished over time (see Ehlers & Steil, 1995). Cambodians worry (a) that flashbacks indicate "weakness" (*khsaoy*) of the mind, possibly causing insanity, and of the body, possibly causing death from physical dysfunction; (b) that flashbacks, by causing fright and rumination about past events, will cause a progressive and dangerous weakening of mind and body; (c) that flashbacks result from the soul leaving the body and returning to Cambodia (*prolung tiw srok khmae*), with the soul possibly being permanently dislodged by the flashback-caused fright, consequently bringing about death or insanity; (d) that certain persons viewed in the flashback, because they are angry at having suffered a bad death (e.g., starvation or execution), cause the re-experiencing of those past events, thereby leading to progressive weakening, with death possibly resulting from either physical dysfunction, soul dislocation, or insanity; and (e) that someone has performed an evil spell upon him or her, causing the re-experiencing of the past events, thereby causing progressive weakening and possibly death from physical dysfunction or soul dislocation during fright.

Our treatment was multifaceted, but adhered to core principles of CBT for PTSD and PD and included interoceptive exposure combined with rehearsal of cognitive restructuring and emotional acceptance in response to trauma memories. We also utilized core CBT principles such as in teaching the spiral of panic and addressing trauma associations to and catastrophic interpretations of sensations. Although the value of relaxation techniques, as in muscle relaxation, has been questioned for some anxiety disorders, and PD in particular (e.g., Schmidt et al., 2000), we provided these treatment elements given (a) the strong somatic focus of many Cambodian patients, (b) the extremely high comorbidity of GAD and PTSD in the Cambodian population (e.g., muscle relaxation effectively treats GAD; Arntz, 2003), and (c) the frequency with which somatic sensations trigger TCMIE-type panic attacks in this population (e.g., muscle tension triggering neck-focused panic attacks). We emphasized mindfulness—including in muscle relaxation and diaphragmatic breathing—to (a) maximize treatment acceptability (Tseng, 1999) and (b) decrease psychopathology (Roemer & Orsillo, 2002).

We believe the uniqueness of our approach derives from its emphasis on sensations, and panic attacks. For this reason, we refer to it as *Sensation Reprocessing Therapy* (SRT). The treatment focuses on sensations, for example, aiming to decrease general arousal, thereby reducing arousal-related sensations (through muscle relaxation and breathing retraining); to perform exposure to fear network-related sensations (through interoceptive exposure and elicitation of sensation-related fear networks); to decastrophize the attitude toward sensations (through modifying catastrophic cognitions and teaching the TCMIE model); and to re-associate sensations to positive affect, memory, and action predispositions (through meditation, visualization, and re-association to a positive and flexible action orientation). The TCMIE model, which focuses on sensations, is at the heart of this approach. In seeking to change the patient's sensation-related experiencing, cognitions, and memory networks, our approach is eclectic (cf. Borkovec et al., 2003).

Several limitations of the present study should be mentioned. It is possible that there was a "therapist effect" because the same individual provided all treatment; a study in which other treaters utilize the manual is needed to make that determination. We are unable to assess whether our culture-related modifications of CBT were necessary; other packages of CBT (e.g., *Cognitive-Processing Therapy*: Resick et al., 2002; *Multiple Channel Exposure Therapy*: Falsetti & Resnick, 2000; or *Prolonged Exposure*: Foa, Dancu, et al., 1999) may have offered a similar degree of benefit to these patients; a comparative study would be needed to investigate this question. In addition, we cannot determine whether this combined treatment is more effective than any one of its components; a comparative study with a dismantling design would be needed to make that determination (e.g., Borkovec & Miranda, 1999; Schmidt et al., 2000). For example, the panic treatment components—as in interoceptive exposure—would need to be compared to the expanded package. Future studies should ideally have the patients take the same medications, maintaining as far as possible

the same medications, and medication amounts throughout treatment; then, in analyses, medication could be considered as a covariate. Finally, future studies should utilize not only symptom measures but also some measures of quality of life or functioning as well as a measure of current stressors. In addition, future studies should use a standard measure of treatment acceptability and an index of the degree of substance abuse.

In summary, our study adds to our program of research (e.g., Hinton, Pham, et al., 2004) supporting the applicability of CBT for the treatment of PTSD and panic attacks in other cultural groups; however, such adaptations require a careful consideration of the group's cultural context. Somatic symptom-related fear networks (e.g., traumatic, catastrophic, metaphoric, and interoceptive associations) as well as the key distress patterns must be carefully identified and targeted for treatment.

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