



A comparison of Narrative Exposure Therapy and Prolonged Exposure therapy for PTSD ☆,☆☆



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HIGHLIGHTS

- There is evidence that PE and NET can be effective in alleviating PTSD symptoms.
- PE's status as a first line treatment for the populations studied seems warranted.
- Research on each treatment has focused on different populations and traumas.
- Future research should investigate each treatments effect on diverse populations.
- Knowledge of the impact of specific components might increase personalization of care.

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ABSTRACT

The purpose of this review was to compare and contrast Prolonged Exposure (PE) and Narrative Exposure Therapy (NET). We examined the treatment manuals to describe the theoretical foundation, treatment components, and procedures, including the type, manner, and focus of exposure techniques and recording methods used. We examined extant clinical trials to investigate the range of treatment formats reported, populations studied, and clinical outcome data. Our search resulted in 32 studies on PE and 15 studies on NET. Consistent with prior reviews of PTSD treatment, it is evident that PE has a solid evidence base and its current status as a first line treatment for the populations studied to this date is warranted. We argue that NET may have advantages in treating complex traumatization seen in asylum seekers and refugees, and for this population NET should be considered a recommended treatment. NET and PE have several commonalities, and it is recommended that studies of these treatments include a broader range of populations and trauma types to expand the current knowledge on the treatment of PTSD.

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Contents

1. Introduction	454
2. Method	455
2.1. Treatment manual review	455
2.2. Clinical trials review	455

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3.	Results	455
3.1.	Comparisons of treatments from manuals	455
3.2.	Theoretical foundations and rationale	455
3.2.1.	Emotional processing	455
3.2.2.	Learning and fear conditioning	456
3.2.3.	Narration	456
3.2.4.	Cognitive change	457
3.3.	Treatment components	457
3.3.1.	Number and length of sessions	457
3.3.2.	Assessment	457
3.3.3.	Homework	457
3.3.4.	Session structure	457
3.3.5.	Psychoeducation	457
3.3.6.	Exposure components	457
3.3.7.	Creating a narrative	460
3.3.8.	Breathing retraining	460
3.4.	Setting and resources	460
3.5.	Therapist training	460
3.6.	Number of traumas addressed	460
4.	Comparison of treatments from published clinical trials	460
4.1.	Number and length of sessions	460
4.2.	Number of participants and sample characteristics	462
4.3.	Study designs and control conditions	462
4.4.	Clinical outcome data	462
4.4.1.	Prolonged Exposure	462
4.4.2.	Narrative Exposure Therapy	462
5.	Discussion	463
6.	Future directions	464
7.	Conclusions	465
	References	465

1. Introduction

Since the diagnosis of posttraumatic stress disorder (PTSD) entered the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1980 (DSM-III, APA, 1980), work has been underway to develop effective psychotherapies. Empirical research suggests that PTSD can be treated effectively using variants of cognitive behavioral therapy (CBT). These interventions are considered a first line treatment for PTSD (Cukor, Olden, Lee, & Difede, 2010; Institute of Medicine, 2008; NICE, 2005; Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010). Prolonged Exposure (PE) therapy is a specific exposure-based type of CBT for PTSD which has been under development since 1982 (Foa, Hembree, & Rothbaum, 2007). PE is the most studied psychotherapy for PTSD, and it is accepted as a gold standard (Cukor et al., 2010; Institute of Medicine, 2008). The goal of PE is to reduce PTSD symptom severity through safe confrontation with thoughts, memories, places, activities and people that have been avoided since a traumatic event occurred (Foa et al., 2007).

There are more than a dozen randomized controlled trials (RCTs) lending support to PE in reducing PTSD symptoms. In reviewing studies on PTSD, Powers et al. (2010) found that 86% of the clients who received PE had better outcomes than clients in control conditions. However, there were no significant differences between PE and the other psychotherapies for PTSD at either post-treatment or follow up.

Despite the demonstrated effectiveness of PE, 25–45% of individuals still meet diagnostic criteria for PTSD after treatment (Van Minnen, Arntz, & Keijsers, 2002). A significant minority of individuals do not complete a full course of therapy, and many cannot access treatment due to constraints on availability, lack of client resources, or other barriers. Moreover, much of the research supporting the efficacy of PE and other interventions has focused on clients in Western countries, often combat-veterans or victims of rape and sexual assault (Breslau, 2009; Foa, Gillihan, & Bryant, 2011; Foa, Keane, & Friedman, 2000).

Complex trauma is characterized by sustained exposure to repeated or multiple traumatic incidents, often of an interpersonal nature, occurring in circumstances where escape is impossible. Examples of complex

trauma are sexual and physical abuse during childhood, being a child soldier, experiencing torture and genocide, or being a refugee. Experiencing this type of trauma is associated with higher rates of PTSD than other types of trauma (Courtois, 2008). Moreover, individuals who experience complex trauma often experience additional trauma-related symptoms characterized by increased difficulties in regulating emotions, problems in relational areas, and dissociation and somatization (Cloitre et al., 2011; Foa et al., 2000).

To date, the diagnostic systems including the DSM-IV and the International Classification of Diseases 10 (ICD-10) described a single trauma as a cause of subsequent posttraumatic symptoms (American Psychiatric Association, 1994; World Health Organization, 1992). The DSM-5 clarifies that PTSD can be the result of one or more traumatic events (American Psychiatric Association, 2013). Knowledge is relatively scarce on how PE and other traditional CBT programs work for individuals with complex trauma, although there are suggestions that individuals with complex trauma may not respond optimally to conventional treatments (Cloitre, 2009).

Although available research on psychotherapies for PTSD indicates that CBTs and exposure therapies are highly efficacious in reducing PTSD symptoms (McLean & Foa, 2011; NCCMH, 2005), it is unknown if these treatments are the best option for survivors of multiple or complex interpersonal traumatic events which are known to affect PTSD severity (Bradley, Greene, Russ, Dutra, & Westen, 2005). These treatments often focus on a single traumatic event, and it has been suggested that complex traumatization may require a different approach (Cloitre, 2009; Green et al., 2000).

There are some studies to date investigating PE and complex traumatization. Van Minnen et al. (2002) found that clients showed good outcomes from PE after having been exposed to sexual abuse and/or battering in childhood or adulthood, and McDonagh et al. (2005) found that for women who had PTSD from childhood sexual abuse, those who received PE and Cognitive Processing Therapy (CPT) were more likely to no longer meet PTSD criteria than those who received present-centered therapy (PCT). All active treatments (PE, CPT, and PCT) were superior to wait list in decreasing PTSD symptoms and

improving related symptoms. These studies provide a more nuanced picture of the challenges faced when meeting complex traumatization. Some populations at higher risk of complex trauma, such as refugees living in insecure and intolerable conditions, may benefit from interventions targeted towards this population.

One intervention which is targeted towards survivors of conflict and organized violence is Narrative Exposure Therapy (NET; Neuner, Schauer, Roth, & Elbert, 2002; Schauer, Neuner, & Elbert, 2011). NET is a manualized treatment developed by researchers and clinical health professionals associated with the organization Victims Voice (VIVO), which works to protect the rights of victims of organized violence and conflict. NET emerged in response to the potentially unique needs of individuals from non-Western cultures, who may have experienced multiple traumas and complex traumatization. NET was developed to treat clinical issues specifically observed in refugees who experienced repeated traumatization, and a hallmark of NET is an emphasis on narration. NET has been recommended for victims of multiple traumas (Crumlish & O'Rourke, 2010), and it has received empirical support for treating PTSD in survivors of conflict and organized violence (Robjant & Fazel, 2010). NET was developed more recently than PE, and it is less well known (a search in PsycINFO of “prolonged exposure” and “PTSD” yielded 267 results, whereas a search of “narrative exposure” and PTSD yielded only 37 results). This may be because the population targeted by NET is narrower, because it has been used primarily in non-Western countries, or because NET is a more recently developed trauma focused treatment.

Given the concern that traditional treatments may not be optimal for survivors of complex trauma, and the relative novelty of NET compared to PE, we sought to compare PE and NET in several domains. We examined the respective treatment manuals to describe and compare each treatment's theoretical foundations and rationale, treatment components, setting and resources, therapist training, and number of traumas addressed. We conducted a review of the published clinical trials that utilized the treatment manuals to describe and compare the number and length of sessions, number of participants, sample characteristics, study design, and control conditions if the study was a controlled trial. We also summarized the clinical outcome data for each treatment.

2. Method

2.1. Treatment manual review

PE has had several iterations of treatment manuals since the 1980s, but for this review we used the manual published in 2007 (Foa et al., 2007). NET has also been in manualized form in different iterations, and for this review we used the revised and expanded second edition of the manual that was published in 2011 (Schauer et al., 2011; the first edition was published in 2005). Two authors of the present review read each of the treatment manuals. Each author made an effort to achieve a comprehensive understanding of the theoretical background, the rationale, the use of the components, and the procedure. The treatments were then discussed and systematically compared. A certified PE or NET therapist was consulted as needed.

2.2. Clinical trials review

We conducted a search in PsychINFO and Web of Science to identify relevant literature. For studies on PE, the following terms were used: “prolonged exposure therapy”, “prolonged exposure” AND “PTSD” OR “posttraumatic stress disorder” OR “post-traumatic stress disorder”. For studies on NET the terms “narrative exposure therapy” were combined with “PTSD” OR “posttraumatic stress disorder” OR “post-traumatic stress disorder”. Inclusion criteria restricted results to peer-reviewed, English-language articles that included human subjects in a RCT or a clinical trial (unrandomized or uncontrolled). We excluded studies where the course of treatment did not explicitly adhere to either

the PE- or NET-manual, or if the treatments were performed in a modified version from the original methods or in combination with a pharmacological treatment. We required that authors cited a reference to an official version of the manual by the original authors.

The initial search yielded a total literature collection of 101 articles on PE and 40 articles on NET. The articles for both PE and NET were reviewed. In the assessment of whether the articles met our criteria, the abstracts and/or the whole article were reviewed manually. Utilizing a snowballing strategy, we hand-searched reference sections and included relevant articles if they did not appear in the original search and yet met all other criteria for inclusion.

3. Results

3.1. Comparisons of treatments from manuals

In this section, based on information gleaned from the treatment manuals and discussions with trainers in the treatments, we describe and compare each treatment's theoretical foundations and rationale, treatment components, setting and resources, therapist training, and number of traumas addressed.

3.2. Theoretical foundations and rationale

3.2.1. Emotional processing

PE builds directly on the theoretical foundation of Emotional Processing Theory (EPT; Foa & Kozak, 1986). According to the EPT, fear is present in our memory as a cognitive structure, containing information concerning fear stimuli, our subsequent fear response, and the meaning assigned to the stimuli (McLean & Foa, 2011). When a fear structure is activated by something objectively not dangerous, it is considered pathological. A pathological fear structure is thus a case of maintaining incorrect associations between stimuli. The EPT model strongly emphasizes the process of habituation and extinction of the fear response and suggests that effective interventions must alter the pathological elements of the fear structure.

PE facilitates changes in the fear response by activating the fear structure and providing new information during exposure and post-exposure processing (Foa et al., 2007). PE prevents the negative reinforcement that occurs with avoidance, both in behavior and cognition, by confronting traumatic memories and reminders during in vivo (situational) exposures and imaginal (recounting a traumatic memory) exposures. One of the primary goals of completing exposures is to enhance emotional processing of traumatic memories to reduce PTSD and other trauma-related symptoms.

NET (Schauer et al., 2011) is also explicitly based, in part, on EPT. The authors of NET suggest that the fear structure needs to be activated in a safe environment to decrease maladaptive associations. NET also integrates the theories of general memory processes. NET assumes that PTSD is a consequence of changes in memories and their storage due to the traumatic event (Schauer et al., 2011). This includes the distinction between declarative and non-declarative memories (Squire, 1992) and semantic and episodic memories (Tulving, 2001). Declarative and semantic memories are memories of factual information that can be consciously retrieved and verbalized. The time, place, and individuals present during specific events are examples of declarative memories. Non-declarative and episodic memories are implicit memories of perceptions, sensations, motor behavior and emotions from events. Typically, individuals have difficulty verbalizing these types of memories, but the memories may be re-experienced in a sensory way. All memories can be “triggered” (i.e., brought to awareness) by external or internal cues (e.g., sounds, smells, or physiological inner states). This division of memory types is consistent with the fear structures and networks described in EPT.

NET explicitly focuses on the relative imbalance of “hot” (also known as “hot-spots” see Grey, Holmes, & Brewin, 2001) and “cold” memories

in PTSD. During intense moments such as those that occur during a traumatic event, the brain stores “hot” aspects of memories that are linked to emotions, physiological changes, and physical distress such as pain (Breedlove, Rosenzweig, & Watson, 2007). Hot memory associations are stronger than cold ones, and the whole memory may be triggered by only one cue through a process of spreading memory activation (Robjant & Fazel, 2010). During re-experiencing of the traumatic event (such as through nightmares, intrusive thoughts, or flashbacks), the fear network becomes reinforced because of the additional layer of emotional distress, and the memory is thus more susceptible to being triggered later. Avoidance of stimuli that might trigger re-experiencing, though understandable, leads to fragmented and disorganized memories that can help maintain symptoms (Schauer et al., 2011).

In PE, after focusing on a full traumatic memory from start to finish during imaginal exposure, the therapist will work collaboratively with the client to select one or two “hot spots” within that memory. These hot spots are moments that are shown to have particular emotional significance to the client (based on the reported or expressed affect during imaginal exposures). One or both hot spots then become the focus of imaginal exposure. The therapist encourages more repetitions of the exposure to the hot spots until the final session (when the entire traumatic memory is reviewed once more). This process is designed to result in faster processing of the trauma. In NET, a primary goal is to address the hot-spots and integrate traumatic events (including “cold spots”) with the client's whole life story, creating a coherent narrative. In both PE and NET, therapists encourage clients to describe the traumatic memories in detail, to identify sensory, emotional, and cognitive components of memories. In both treatments, the goal is to integrate memories into a narrative that helps to make meaning from a chaotic event.

3.2.2. Learning and fear conditioning

Both NET and PE are based in learning and fear conditioning models (McLean & Foa, 2011). The principles of these models explain PTSD development as an association between a conditioned stimulus (CS), which is a stimulus that objectively does not pose any danger, and the traumatic event, which constitutes the unconditioned stimulus (US; objectively dangerous). Traditional learning theory would suggest that repeated exposure to the CS (trauma-related but generally safe stimuli) in the absence of the US (trauma) will lead to fear extinction (i.e., a reduction in anxiety in the presence of the CS). Individuals who engage in persistent avoidance of trauma-related stimuli fail to experience the extinction process. Instead, anxiety is maintained and the fear structure remains intact (Rothbaum & Davis, 2003). Indeed, through negative reinforcement of avoidance or escape behaviors, such as the feeling of relief, these behaviors may become more pronounced over time.

Learning models are relevant for methods for treating PTSD. Habituation, or an observed reduction in anxiety when an individual remains in a fear-provoking situation over time, is one proposed method for achieving symptom reduction in NET and PE. In addition to reducing anxiety, habituation through repeated exposure to fear-provoking stimuli may change cognitions related to fear, such as clients learning that the fear reaction will eventually subside (Foa et al., 2007). Habituation of a fear response to one stimulus may also be generalized to another similar stimulus. Research on fear conditioning has challenged the view that extinction or elimination of fear responses will change the stimulus-fear associations originally established during the course of the traumatic event (eg., Craske et al., 2008). Instead, the extinction involves a regulative process to thoroughly evaluate the situation compared to the more automatic evaluation inherent in the fear structure. Brewin (2001) suggests that this cortical evaluation is dependent on declarative memories related to the stimulus. The NET manual (Schauer et al., 2011) additionally notes that while habituation usually leads to a decrease in the fear response, presentation of a more salient or different stimulus in the same environment may lead to the recovery

of the habituated response, called dishabituation (see Grissom & Bhatnagar, 2009) or sensitization (see Groves & Thompson, 1970).

3.2.3. Narration

One of the main theoretical differences between PE and NET is NET's emphasis on creating a cohesive narrative of the client's life, from birth to present, to integrate the traumatic memory with the context of the individual's life as a whole. This component of the NET treatment derives first from models of memory in PTSD that suggest that improving coherence and context in the traumatic memory may reduce fragmented memories. This occurs in part through the use of the past tense and attempting to temporally reference traumatic experiences within the individual's life overall. The narrative also builds on an oral tradition of storytelling in many cultures, which contributes to making NET a culturally adaptable therapy (McPherson, 2011; Neuner, Schauer, Klaschik, Karunakara, & Elbert, 2004). This may have advantages for the treatment of traumatized refugees and asylum seekers. Baikie and Wilhelm (2005) suggests that the development of a coherent narrative helps to “reorganize and structure the traumatic memory resulting in more adaptive, internal schemas” (p. 341). In NET, the narrative is also written down by the therapist, read aloud by the client throughout treatment, and given to the client at the end of treatment (Neuner et al., 2004). The research on NET points to the importance of constructing a written narrative in the cognitive reappraising and processing of the trauma, and it has been suggested that this may be more beneficial than exposure alone. However, more research is needed to clarify whether the beneficial results from NET come from the therapist writing the narrative or whether the therapy would be equally beneficial when the client writes the narrative.

The narrative component of NET is based on testimony therapy (TT). TT was first conducted by Cienfuegos and Monelli (1983) in an attempt to document the oppression that political prisoners experienced during the Chilean dictatorship. The primary objective of the narrative in NET is to create a descriptive account of the traumatic events the client experienced in the larger context of organized violence, war crimes, or other politically relevant traumatic events. It is thought that the process of creating this testimony promotes emotional healing by giving meaning to the individual's experience. The creation of this historical record of events is thought to reduce shame and guilt and provide an opportunity to re-evaluate beliefs about the event (e.g., highlighting evidence of courage), while increasing the subjective sense of agency or power (Lustig, Weine, Saxe, & Beardslee, 2004).

Research on TT is sparse and consists mostly of case studies (e.g. Agger & Jensen, 1990). However, TT reduced symptoms of PTSD and depression and increased the Global Assessment of Functioning (GAF) score in Bosnian survivors of ethnic cleansing (Weine, Kulenovic, Pavkovic, & Gibbons, 1998). The authors interpret these preliminary findings as evidence that the creation of a narrative improves psychosocial functioning. They suggest that testimonies enhance psychosocial functioning in terms of (1) documenting and communicating the story; (2) reconstructing a sense of self, identity and attachment to the community; and (3) contributing to the oral tradition that is strong in many cultures. NET's linkage to the community, through TT, and relating to a communal or public story of trauma may be an essential component of the treatment.

PE also has a narrative component, via the recounting of a traumatic memory, but that element is focused on that specific event (sometimes more than one event) rather on a broader autobiographical story. PE and NET share a focus on improving the client's narrative cohesion and thus a better integration of the traumatic memory. PE also has elements that link the client with the community, through the processing of the imaginal exposure and through in-vivo assignments that may involve significant others or going to public places. It is worth noting that while NET uses past tense and often includes many traumatic memories, PE encourages using present tense when describing memories to

help engage the client and typically involves the recounting of a single memory identified as the worst memory by the client.

3.2.4. Cognitive change

In both PE and NET, the nature of cognitive change during the course of treatment is not described explicitly. In the case of PE, discussion of these beliefs often takes place during the course of processing the imaginal and in vivo exposure exercises. After the fear network is activated, the therapist may identify maladaptive thoughts described by the client and choose to highlight these in an effort to make thoughts more accurate or helpful. Similarly, in the course of NET, the therapist may choose to explore client cognitions that may be inaccurate or narrow. Changes in cognition may occur spontaneously in some individuals, while in other cases techniques such as Socratic questioning may be helpful to facilitate symptom reduction. Neither treatment manual mandates or formally guides cognitive restructuring.

It is reasonable to assume that the types of thoughts that arise and are modified in these treatments will have similarities. For example, a therapist doing either intervention might discuss with the client how experiencing trauma impacted his or her beliefs about control or safety. However, since NET emphasizes a lifespan perspective, clients may describe thoughts that are more global or reflect experiences prior to the trauma within the lifeline. In either treatment, cognitions about the relative safety of activities may also differ depending on the individuals who are treated. A therapist treating a refugee who may return to a war zone may describe the relative safety of participation in activities differently than someone who has survived a house fire or motor vehicle accident.

3.3. Treatment components

3.3.1. Number and length of sessions

In PE, as described in the manual, sessions are 90 min long and the number of sessions typically ranges from 10 to 15 (Foa et al., 2007). A typical NET session, as described in the manual, lasts from 90 to 120 min and the number of sessions typically ranges from 5 to 10 sessions. NET is a short-term treatment approach and has been carried out with differing lengths of treatments (see Table 3), all depending on the setting and severity of PTSD (Schauer et al., 2011). Both manuals are designed for individual (one-on-one) treatment, and in both treatments sessions can be conducted once or twice weekly.

3.3.2. Assessment

In both PE and NET it is important to do an initial assessment of the client's posttraumatic symptoms and establish if the client meets the criteria for a PTSD diagnosis. Both treatments highlight the importance of a thorough assessment of posttraumatic symptoms, as well as comorbid disorders. Diagnostic instruments that screen for typical traumatic events (criterion A in the DSM). While NET therapists use this information to get an overview of possible traumatic events that might appear within the narrative (Schauer et al., 2011), PE therapists seek to ascertain which traumatic memory is the most distressing and will be the index trauma during treatment (Foa et al., 2007).

3.3.3. Homework

In PE, the therapist audio records the imaginal exposure, the breathing retraining, and most of the remaining components of sessions. Clients listen to these recordings as homework (tasks to complete outside of the weekly sessions with the therapist) to repeat the psychoeducation about PTSD, normalize symptoms, and underscore the rationale for the treatment while also practicing the breathing retraining and receiving additional exposure to the traumatic memory. The client is also encouraged to read information sheets and to do in vivo exposure between sessions. The in vivo assignments typically include the client engaging in activities that have been feared since the trauma but are objectively safe, such as going to a park, driving a

car, going shopping, or sitting with one's back to other people. In NET there are no homework tasks assigned.

3.3.4. Session structure

The session structure in PE and NET has similarities, but the timing of the components is different. The first session of both treatments have much in common (psychoeducation and rationale), but in session two PE focuses on in vivo exposure (rationale and practice) plus the review of homework while NET focuses on creating the lifeline. In session three both treatments focus on imaginal exposure. These sessions are audio recorded in PE, whereas in NET the therapist writes a summary of the narrative and it is read out loud in subsequent sessions. The last session in PE consists of reviewing the progress that has been made and on relapse prevention. In NET, however, a completed and coherent summary of the client's narrative is read out loud, and the client receives a signed copy.

3.3.5. Psychoeducation

Both NET and PE have psychoeducation included, for the same purpose. According to Schauer et al. (2011), clients report feeling relieved when hearing that their symptoms and distress are a common response to a traumatic experience and that psychotherapy may help relieving these symptoms. In PE, psychoeducation is repeated and elaborated across several sessions (Foa et al., 2007), whereas in NET it is completed within the first session of treatment. PE integrates psychoeducation with a focus on homework and exposures (in vivo and imaginal), usually with a single trauma focus, whereas NET has a greater focus on the narrative component throughout and utilizes a lifespan approach to traumatic events.

3.3.6. Exposure components

Imaginal and in vivo exposures are the core elements of PE, while NET uses only imaginal exposure. NET and PE are similar with regard to using imaginal exposure to traumatic events as a means to reduce PTSD symptoms. As we have noted, imaginal exposure relies on habituation and extinction, and is based on the idea that talking about a traumatic memory in detail will eventually reduce fear and make the memory properly integrated through emotional processing (Foa & Meadows, 1997). The essence of imaginal exposure is that providing the client with corrective information while the fear structure is activated will change the pathological associations in the fear structure. The revisiting of the memory will likely feel uncomfortable and frightening initially, and the aim of the exposure is to help the client realize that talking through the trauma is safe and not that same as re-experiencing it (Foa & Meadows, 1997). Exposure is designed to elicit anxiety in the short term, and it can potentially exacerbate anxiety in the first few sessions (Breslau, Chilcoat, Kessler, Peterson, & Lucia, 1999). However, research supports the efficacy of exposure therapy for the treatment of PTSD (Foa et al., 2000; McLean & Foa, 2011; Rothbaum, Meadows, Resick, & Foy, 2000), and the occasional exacerbation of symptoms tends to be transient (Foa, Zoellner, Feeny, Hembree, & Alvarez-Conrad, 2002).

In vivo exposure is used in PE but not in some other prominent CBTs, including NET and cognitive processing therapy. According to McLean and Foa (2011), in vivo exposure mimics the natural recovery process by activating the fear structure and providing the client with corrective information in real life. Drawing on principles from learning theory, in vivo exposure helps the client integrate more realistic information in the feared, but objectively safe situations. This is achieved through constructing a hierarchy of the client's fear-eliciting situations. The client is encouraged to counteract avoidance by exposing himself or herself to gradually more feared situations, thereby experiencing habituation to those situations.

Table 1
Overview of PE studies that Met Inclusion Criteria.

Study	Number of sessions	Length of sessions (in minutes)	Population	Number of PE participants (total number of participants)	Study design	Control condition (when applicable)	Dropout rate
Aderka, Foa, Applebaum, Shafraan, and Gilboa-Schechtman (2011)	12–15	90	Children and adolescents in Israel	73	Uncontrolled clinical trial	Not reported	Not reported
Aderka, Gillihan, McLean, and Foa (2013)	8	90–120	Women of mixed ethnicity, mainly survivors of sexual assault	79 (153)	RCT	Wait list or Prolonged Exposure Therapy with cognitive restructuring	Not reported
Asukai et al. (2008)	9–15	90	Japanese patients with PTSD due to mixed traumatic events	12	Uncontrolled clinical trial	Not reported	2/12 (17%)
Asukai et al. (2010)	8–15	90	Japanese civilians, sexual or physical assault, or accidents	12 (24)	RCT	Treatment as usual	PE: 3/12 (25%) TAU: 1/12 (85)
Bluett, Zoellner, and Feeny (2014)	10	90–120	Survivors of both sexual and nonsexual assault, general accidents, combat, and persons experiencing unexpected death or injury of a loved one.	116 (116)	Uncontrolled clinical trial	Not reported	28/116 (24%)
de Bont, van Minnen, and de Jongh (2013)	12	90	Dutch psychotic patients suffering from PTSD	5 (10)	RCT	Eye Movement Desensitization and Reprocessing	PE: 1/5 (20%) EMDR: 1/5 (20%)
Eftekhari et al. (2013)	8–15	90	Both combat and noncombat-related war traumas, as well as military sexual traumas, and childhood and postchildhood traumas.	1816 (1816)	Uncontrolled clinical trial	Not reported	542/1816 (30%)
Feske (2008)	9–12	90	Female survivors of sexual or physical assault	9 (21)	RCT	Treatment as usual	PE: 0/9 (0%) TAU: 0/12 (0%)
Foa et al. (1999)	9	90	Female survivors of sexual or physical assault	25 (96)	RCT	Stress inoculation training, combined treatment (PE-SIT), or wait list	PE: 3/25 (12%) SIT: 7/26 (27%) PE-SIT: 8/30 (27%) WL: 0/15 (0%)
Foa et al. (2005)	9–12	90	Caucasian or African American (U.S.)	79 (179)	RCT	Prolonged Exposure, Prolonged Exposure + Cognitive Restructuring or Wait list	PE: 27/79 (34%) PE + CR: 30/74 (41%) WL: 1/26 (4%)
Foa and Rauch (2004)	9–12	90–120	Female survivors of sexual or physical assault	40 (95)	RCT	PE + cognitive restructuring or wait list	PE: 13/40 (33%) PE + CR: 19/46 (41%) WL: 3/9 (33%)
Foa, Rothbaum, Riggs, and Murdock (1991)	9	90	Female survivors of rape	14 (55)	RCT	Stress inoculation training, supportive counseling, or wait list	SIT: 3/17 (18%) PE: 4/14 (29%) SC: 3/14 (21%) WL: 0/10 (0%)
Gilboa-Schechtman et al. (2010)	12–15	60–90	Adolescent PTSD patients of traffic accidents, non- and sexual assault, terrorist attack or other (U.S.)	19 (38)	RCT	Time-Limited Dynamic Psychotherapy	PE: 4/19 (21%) TLDP-A: 4/19 (21%)

Goodson, Lefkowitz, Helstrom, and Gawrysiak (2013)	9–12	90	Veterans with combat related traumas	115 (115)	Uncontrolled clinical trial	Not reported	31/115 (27%)
Hembree, Cahill, and Foa (2004)	10	90–120	Survivors of sexual or nonsexual assault	41 (75)	RCT	PE + Cognitive Restructuring	PE:0/41 (0%) TAU: 0/34 (0%)
Ironson, Freud, Strauss, and Williams (2002)	Not reported	Not reported	Survivors of spousal abuse and adult survivors of childhood sexual abuse	12 (22)	RCT	Eye Movement Desensitization and Reprocessing	PE: 6/12 (50%) EMDR: 0/10 (0%)
Moser, Cahill, and Foa (2010)	9–12	90–120	Female sexual or nonsexual assault survivors (U.S.)	27 (54)	RCT	Prolonged Exposure vs Prolonged Exposure + Cognitive Restructuring	Not reported
Nacasch et al. (2011)	9–15	90–120	PTSD in combat veterans in Israel	15 (30)	RCT	Treatment as usual	PE: 2/15 (13%) TAU: 2/15 (13%)
Rauch et al. (2009)	7–21	80	Caucasian war veterans	10 (10)	Clinical trial	Not reported	Not reported
Resick et al. (2003)	9	90	Female survivors of rape (U.S.)	40 (121)	RCT	Cognitive-processing Therapy or Wait list	PE:11/40 (28%) CPT:11/41 (26,8%) WL: 6/40 (14,9%)
Rothbaum et al. (2005)	9	90	Female survivors of rape (U.S.)	23 (72)	RCT	Eye Movement Desensitization and Reprocessing or Wait list	PE: 3/23 (13%) EMDR: 5/25 (20%) WL: 5/24 (21%)
Schnurr et al. (2007)	10	90	Female veterans (U.S.)	141 (284)	RCT	Present-centered Therapy	PE: 53/141 (38%) CT: 30/143 21%)
Simon et al. (2008)	8	90–120	Outpatients from 4 different academic centers (U.S.)	68 (68)	RCT (treatment with Prolonged Exposure alone first, then with Paroxetine or placebo)	Prolonged Exposure + Paroxetine vs Prolonged Exposure + Placebo	24/68 (35%)
Sripada et al. (2013)	8–15	90	Veterans with mild traumatic brain injury	51 (51)	Uncontrolled clinical trial	Not reported	11/51 (22%)
Thorp et al. (2012)	12	90	Veterans (mostly combat) (U.S.)	11 (11)	Clinical trial with comparison condition	A treatment-as-usual comparison condition with 55 subjects	3/11 (27%)
Tuerk et al. (2013)	7–15	90	Combat veterans (U.S.)	60 (60)	Uncontrolled clinical trial	Not reported	16/60 (27%)
Tuerk et al. (2011)	10	90	Combat veterans (U.S.)	65 (65)	Uncontrolled clinical trial	Not reported	43/65 (66%)
Tuerk et al. (2010)	10	90	American war veterans (U.S.)	47 (47)	Unrandomized clinical trial	In-person Prolonged Exposure	PE in person: 6/35 (17%) PE via telehealth: 3/12 (25%)
Van Minnen et al. (2002)	9	90	Civilians with mixed types of trauma	122 (122)	Uncontrolled clinical trial	Not reported	Group 1: 14/59 (24%) Group 2: 20/63 (32%) (both received PE)
Yoder et al. (2013).	11 (Intent-to-Treat); 13 (completers)	90	Older combat veterans	65 (65) ^a	Uncontrolled clinical trial	Not reported	10/65 (15%)
Yoder et al. (2012).	8–10	90	Combat veterans (U.S.)	112 (112)	Uncontrolled clinical trial	Not reported	18/112 (16%)
Zoellner, Feeny, Fitzgibbons, and Foa (1999)	9	90–120	Female survivors of sexual and nonsexual assault	24 (95)	RCT	Stress inoculation training, PE and Stress inoculation training, or wait list	16/95 (17%)

^a Note: There are 21 overlapping subjects in Yoder et al. (2012) and Yoder et al. (2013).

3.3.7. Creating a narrative

In NET, the narrative partially overlaps with imaginal exposure to traumatic events. However, another purpose of the narrative is to document the refugee's trauma story (Weine et al., 1998), emphasizing the political context associated with traumatizing events (Van Dijk, Schoutrop, & Spinhoven, 2003). As we've noted, the narrative also covers the whole lifespan, and includes all of the traumatic events as well as pleasant memories. All traumatic incidents are addressed through the following stages: childhood, pretrauma (brief), first traumatic incident (detailed), posttrauma (brief), lifetime in between (very condensed), second and following traumatic incidents (detailed) and outlook for the future (brief) (Schauer et al., 2011). In NET, a lifeline is often created to represent the client's life. An object, often a rope, is used to provide a visual representation of the client's lifespan and marked with other objects (e.g., sticks or stones) that represent important events. Before talking through a traumatic incident, clients are encouraged to establish time and setting and identify the beginning of the traumatic event.

3.3.8. Breathing retraining

In PE, breathing retraining is a coping skill aimed at reducing anxiety and general tension (Foa et al., 2007). The purpose is to teach the client to control and calm their breathing. The rationale is that when cues evoke fear or anxiety, we tend to breathe more rapidly. When the situation does not involve real danger, a severe increase in breathing leads to hyperventilation, which may evoke bodily sensations reinforcing the feeling of fear. When the client learns how to exhale slowly, this reduces tension and distress and hence is assumed to reduce fear and anxiety (Foa et al., 2007; McLean & Foa, 2011). PE therapists are careful to instruct clients about when to use breathing retraining (e.g., when trying to fall asleep) or when not to use it (e.g., during therapeutic exposures). Breathing retraining is used in PE but not in NET.

3.4. Setting and resources

NET and PE differ in the type of equipment and facilities needed in order to properly conduct the therapy. In the case of PE, the standardized empirically supported protocol requires the use of audio recording equipment (cassette tapes or digital recorders), as well as access to writing implements and paper for homework and in-session recording by therapists. Therapists also use a checklist to ensure that they cover all components of treatment, and most iterations of PE involve showing videos (using video media and video players) to demonstrate key procedures and underscore the treatment rationale. In NET, the therapist may also need paper and a writing implement to document the narrative, but the treatment generally relies more on materials found organically within the treatment setting (e.g., to create the lifeline), which are typically items that are readily available (ropes, sticks, and stones). Because treatment often takes place in refugee camps or other areas with minimal resources (e.g., lack of electricity, office supplies such as batteries, safe storage), visual aids are more instantly available and applicable than technical equipment.

3.5. Therapist training

PE and NET have similar requirements for training therapists. Full PE training includes a four day workshop and the completion of at least two training cases, and full NET training requires a three day workshop and the completion of an unreported number of training cases. PE has more components than NET, and this could make training therapists more challenging. NET could therefore be advantageous in countries with fewer trained therapists or less educated lay-personnel.

However, non-therapists have learned and applied both PE (Foa, McLean, Capaldi, & Rosenfield, 2013) and NET (Robjant & Fazel, 2010). According to a meta-analysis by Gwozdziwycz and Mehl-Madrona (2013), the use of laypersons with no or minimal background in

medicine or psychology for performing NET is effective and warranted. It is plausible that this immediate availability of counselors with knowledge on NET makes it preferable in situations of crisis in which a person experiences multiple traumas, since more people may be able to conduct this form of treatment. This is often the case in resource-poor countries (Neuner et al., 2008). It should be noted, however, that community counselors with no experience in treating anxiety disorders conducted PE treatment in a study by Feske (2008). The population was African American women with low income and with complex psychiatric and traumatic histories. PE was beneficial in reducing both core PTSD symptoms and associated symptoms of depression.

3.6. Number of traumas addressed

As stated earlier, NET addresses all of the client's traumatic memories chronologically, while PE typically addresses a single event or the traumatic memory identified as the worst ("index event") by the client. The client is asked to create a hierarchy of the memories and rank them based on which elicit the greatest distress currently (McLean & Foa, 2011). PE assumes that exposure to one trauma will have generalized benefits to other traumatic memories. However, this is sometimes challenging for clients, who can struggle about which of different horrifying events should be deemed "worst" (thereby seeming to diminish the horror of the others and a client perception of dishonoring others who were injured or killed in those events). In NET, the assumption is that the individuals with trauma histories have likely experienced more than one traumatic event. Processing the hot spots for all significant memories is thought to be important in NET, and restricting the focus to one memory is viewed as unnecessary and inhumane (Schauer et al., 2011).

There are, however, circumstances where PE allows for addressing more than one trauma. If exposure to the worst memory does not alleviate the symptoms sufficiently, it is recommended to proceed to the next traumatic memory. If the client experience uncertainty related to being able to handle the distress related to the exposure to the worst memory, a less distressing memory in the hierarchy might be addressed first. The theoretical foundation of PE does assume that exposure to the worst memory should be sufficient in alleviating the posttraumatic symptoms. If several memories are addressed during treatment, they are done so independently and not necessarily in a chronological and narrative fashion as in NET.

4. Comparison of treatments from published clinical trials

In this section, we provide an overview of results from the review of the published clinical trials that utilized the treatment manuals. We describe and compare the number and length of sessions, number of participants, sample characteristics, study design, drop outs and control conditions if the study was a controlled trial. We also summarize the clinical outcome data for each treatment. The articles included for the review included 19 RCT studies and 13 clinical trials of PE (32 in total) and 12 RCT studies and 3 clinical trials of NET (15 total). Tables 1 and 2 provide an overview of the included studies for PE and NET, respectively.

4.1. Number and length of sessions

The number of sessions in the 32 PE studies ranged from 7 to 21 (both extremes of this range were reported in the Rauch et al. (2009) uncontrolled clinical trial in an outpatient clinic), and the length of sessions ranged from 60 to 120 min. Summarizing across the studies, the typical reported course of PE was approximately 10 sessions of 90 min each. The number of sessions in the 15 NET studies ranged from 4 to 14, and the length of sessions ranged from 60 to 150 min. Summarizing across the studies, the typical reported course of NET was approximately 7 sessions of 90 min each. Thus, the relative mean "dosage" (time

Table 2
Overview of NET studies that Met Inclusion Criteria.

Study	Number of sessions	Length of sessions (in minutes)	Population	Number of NET participants (total number of participants)	Study design	Control condition (when applicable)	Drop out rate
Bichescu et al. (2007)	5	120	Adult Romanian survivors of political imprisonment	9 (18)	RCT	Psychoeducation	0/18 (0%)
Catani et al. (2009)	6	60–90	Sri Lankan children displaced by war and natural disaster	16 (31)	RCT	Meditation relaxation	0/31 (0%)
Ertl et al. (2011)	8	90–120	Former Ugandan child soldiers	29 (85)	RCT	An academic catch-up program with elements of supportive counseling or wait list	NET: 4/29 (14%) SC: 5/28 (18%) WL: 0/28 (0%)
Halvorsen and Stenmark (2010)	10	90	Survivors of torture, mainly from Iraq	16	Clinical trial	Not reported	0/16 (0%)
Hensel-Dittmann et al. (2011)	10	90	Adult PTSD patients (mostly asylum seekers) in resettlement in Germany	15 (28)	RCT	Stress Inoculation training	NET: 3/15 (20%) SIT: 2/13 (15%)
Hijazi (2013)	3	60–90	Middle eastern youth refugees of war	53 (53)	Clinical trial	Not reported	0/53 (0%)
Neuner et al. (2010)	9	120	Adult asylum seekers and refugees from Turkey, Balkan Islands and Africa with a history of state-sponsored violence	16 (32)	RCT	Treatment as usual	NET: 2/16 (13%) TAU: 0/16 (0%)
Neuner, Catani, et al. (2008), Neuner, Onyut, et al. (2008)	6	60–120	Adult Rwandan and Somali refugees in a refugee settlement	111 (277)	RCT	Trauma counseling and wait list	NET: 4/111 (4%) TC: 22/111 (20%)
Neuner et al. (2004)	4	90	Adult Sudanese refugees in a refugee settlement	17 (43)	RCT	Supportive counseling or Psychoeducation	NET: 1/17 (6%) SC: 2/14 (14%) PED: 0/12 (0%)
Onyut et al. (2005)	4–6	60–120	Somali refugee children	6	Clinical trial	Not reported	0/6 (0%)
Pabst et al. (2014)	14	90	Patients with borderline personality disorder with comorbid PTSD	11 (22)	RCT	Dialectical Behavior Therapy	NET: 2/11 (18%) DBT: 3/11 (27%)
Ruf et al. (2010)	8	90–120	Children and adolescents survivors of organized violence mainly from Turkey, Balkan Islands and Syria living in resettlement	13 (26)	RCT	Wait list	KIDNET: 1/13 (8%) WL: 0/26 (0%)
Schaal et al. (2009)	3 NET + 1 grief session	120–150	Rwandan adolescent and young adult orphans of genocide	12 (26)	RCT	Interpersonal psychotherapy	0/26 (0%)
Stenmark et al. (2013)	10	90	Middle Eastern and African refugees and asylum seekers	51 (81)	RCT	Treatment as usual	NET: 5/51 (10%) TAU: 4/30 (13%)
Zang et al. (2013)	4	60–90	Chinese adult survivors of natural disaster	11 (22)	RCT	Wait list	0/22 (0%)

commitment by therapist and client) of in-session treatment (sessions by minutes) is 900 min for PE and 630 for NET. The does not include out-of-session homework completed by PE clients. Homework time varies in PE, but it is not unusual for clients to spend about 60 min per day (420 min per week, or 4200 over 10 weeks) on homework. Thus, the total dosage of treatment for PE is approximately 5100 min, about eight times that of NET. In refugee camps and settlements with large numbers of people and limited monetary resources, most psychotherapeutic intervention need to time limited (Schauer et al., 2011). NET demands significantly less time compared to PE, suggesting that NET may be a viable treatment option in those settings.

4.2. Number of participants and sample characteristics

The number of participants in the PE studies who initiated PE ranged from 5 to 1861, with a mean of 104.63 participants and a median of 40.5 participants. Two of the PE trials focused on children/adolescents/young adults, and one focused on older adults, while the rest were mixed ages. Five of the PE trials focused on women, and one focused on men, while the remainder had a mix. All but four of the PE trials were focused on individuals from Western regions, including 12 in the U.S. and 2 in Israel. Two trials were conducted with Japanese participants. Regarding trauma type, 4 PE trials focused on combat, 3 focused on rape/sexual assault, and the rest treated a sample of mixed trauma types. Six of the samples were comprised of military veterans. None of the PE trials focused on asylum seekers, refugees, victims of genocide or other organized violence, displacement by war or natural disaster; survivors of political imprisonment; the experiences of child soldiers; or survivors of torture.

The number of participants in the NET studies who initiated treatment ranged from 6 to 111, with a mean of 25.73 participants and a median of 16 participants. Five of the NET trials focused on children/adolescents/young adults, and none focused on older adults, while the rest were mixed ages. None of the NET trials focused on women or men solely—all were mixed sex samples. All but one of the NET trials were focused on individuals from non-Western regions, including individuals from Africa, the Balkan Islands, China, Iraq, Romania, Rwanda, Somalia, Sri Lanka, Sudan, Syria, Turkey, Uganda, or a mix of regions. Regarding trauma type, 7 trials focused on asylum seekers, refugees (including individuals displaced by war or natural disaster), or victims of genocide or other organized violence; 1 focused on survivors of political imprisonment; 1 focused on experiences of child soldiers; and 1 focused on survivors of torture. None of the NET trials focused on combat by adults, and none focused exclusively on rape/sexual assault. None of the NET samples were comprised of adult military veterans, though one was focused on child soldiers.

4.3. Study designs and control conditions

Eighteen of the thirty-two PE trials (56.25%) were RCTs, one was a nonrandomized controlled clinical trial (Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010), one was a nonrandomized clinical trial with a comparison condition (Thorp, Stein, Jeste, Patterson, & Wetherell, 2012), and twelve were uncontrolled clinical trials. Mean drop out rates across all PE studies was 27.20%. Control conditions in the PE trials included wait list (8), treatment as usual (3), PE plus cognitive restructuring (3), stress inoculation training (3), PE plus stress inoculation training (2), supportive counseling (1), time-limited dynamic therapy (1), cognitive processing therapy (1), Eye Movement Desensitization and Reprocessing (3), present-centered therapy (1), paroxetine vs. placebo (both for PTSD refractory to PE yet with continued PE sessions (1), and in-person PE (as compared to PE via teleconferencing (1)).

Twelve of the fifteen NET trials (80%) were RCTs, and three were uncontrolled clinical trials. Mean drop out rates across all NET studies was 5.06%. Control conditions in the NET trials included wait list (4), supportive counseling (3, including one combined with “academic catch

up”), psychoeducation (2), treatment as usual (2), meditation relaxation (1), interpersonal psychotherapy (1), Dialectical Behavior Therapy (1), and stress inoculation training (1).

4.4. Clinical outcome data

4.4.1. Prolonged Exposure

No studies have directly compared PE and NET, though there is evidence that both treatments are effective in reducing PTSD symptoms. Powers et al. (2010) performed the most recent meta-analysis focused on PE, including 13 studies that required the full PTSD diagnosis, random assignment, an adequate control condition (psychological placebo or wait list control), adult or adolescent participants, and at least two sessions of PE. The authors found that PE was significantly more effective than control conditions on measures of PTSD at post-treatment and follow-up. About 86% of the clients that received PE had better outcomes than clients in the control group. Similarly, PE treatment was associated with significantly improved outcomes on secondary outcome measures such as anxiety and depression, both at post-treatment and at follow-up. These results support PE as a highly effective treatment for PTSD with long-term benefits.

In addition, a multidisciplinary review by Bradley et al. (2005), which included 13 studies on exposure-based therapies for PTSD between 1980 and 2003, concludes that exposure therapies reduce symptoms significantly in 40–70% of those receiving treatment. Amongst the clients who entered treatment, 44% improved at the end of the study, and of those who completed treatment 54% had symptom improvement. The treatment interventions which proved to be the most efficient were exposure (53%) and exposure plus cognitive components (56%).

Multiple studies on survivors of rape, nonsexual assault and childhood abuse (eg., Foa et al., 1999; Rothbaum, Astin, & Marsteller, 2005) and war veterans (e.g., Thorp et al., 2012; Tuerk et al., 2011; Wolf et al., 2012) have lent support to PE as a highly efficient PTSD treatment. Research has shown PE to treat both acute and chronic PTSD, and the treatment gains are generally maintained at short (i.e., one year) and long-term (i.e., 5–10 years) follow up (McLean & Foa, 2011; Resick, Williams, Suvak, Monson, & Gradus, 2012). However, it is uncertain if PE is a significantly better treatment for PTSD compared to other evidence-based treatments.

Preliminary findings from two studies do suggest that PE may be acceptable and effective in clients from non-Western cultures. In these studies, Asukai and colleagues provided PE to clients in Japan (Asukai, Saito, Tsuruta, Kishimoto, & Nishikawa, 2010, Asukai, Saito, Tsuruta, Ogami, & Kishimoto, 2008). Both studies found PE to significantly ameliorate PTSD symptoms in the samples, indicating the efficacy of Western exposure therapy for Japanese culture. In addition, there are studies lending support to PE as an effective treatment for survivors of multiple traumas or more complex interpersonal traumas (McDonagh et al., 2005; Van Minnen et al., 2002). A study by Resick, Nishith, and Griffin (2003) showed that female rape victims with PTSD, whether or not they had histories of childhood sexual abuse, responded well to PE (and CPT). One study by Paunovic and Öst (2001) found that PE (and CBT) resulted in large improvements on all the measures, which were maintained at the follow-up, for refugees with PTSD. So, while much of the extant research on PE is targeted towards single trauma PTSD, there are studies suggesting efficacy in clients with complex traumatization and refugees.

4.4.2. Narrative Exposure Therapy

Several studies on NET have shown that subjects experience significant relief from PTSD symptoms supporting the efficacy of NET. Neuner et al. (2004) found that NET produced better results compared to psychoeducation alone or supportive counseling (SC) alone among Sudanese refugees in Uganda. At the four-month follow-up, all groups had an increase in symptoms, which the authors believed to be due to external stress like reduction in food rations and pressure to return to

the place they had fled (Neuner et al., 2004). At the one year follow-up, the NET group had significantly lower levels of PTSD symptoms compared to psychoeducation or SC. Between treatment completion and follow-up, 93% of all participants had experienced at least one additional trauma. Still, 71% of NET group participants were in remission from PTSD, while only 21% in the SC group and 20% of the psychoeducation group were in remission.

Bichescu, Neuner, Schauer, and Elbert (2007) found NET to be superior to psychoeducation in relieving PTSD symptoms, and it was the only condition that produced a significant reduction in symptoms. In the NET group, 55.5% were in remission at the 6 months follow-up, while only 11.1% in the psychoeducation group were in remission. Other studies have also found NET to be effective in significantly reducing PTSD symptoms (Halvorsen & Stenmark, 2010; Hijazi, 2013; Neuner, Catani, et al., 2008; Onyut et al., 2005; Stenmark, Catani, Neuner, Elbert, & Holen, 2013) and in some cases to be superior to the other treatment conditions (Catani et al., 2009; Ertl, Pfeiffer, Schauer, Elbert, & Neuner, 2011; Hensel-Dittmann et al., 2011; Neuner, Onyut, et al., 2008; Neuner et al., 2010; Pabst et al., 2014; Ruf et al., 2010; Schaal, Elbert, & Neuner, 2009; Stenmark et al., 2013; Zang, Hunt, & Cox, 2013). Compared to Stress inoculation training (SIT), Hensel-Dittmann et al. (2011) found that treatment with NET lead to a significant PTSD symptom reduction even in severely traumatized refugees and asylum seekers. Ertl et al. (2011) examined participants who were former Ugandan child soldiers. They compared NET to an academic catch-up program with elements of SC or a wait list. NET resulted in greater reduction of PTSD symptoms compared to an academic catch-up program including SC or wait list. Ruf et al. (2010) examined the effectiveness of NET compared to a waiting list for children (KIDNET) in treating PTSD in refugee children

living in exile. The KIDNET group, but not the controls, showed a clinically significant improvement in symptoms and functioning after only 8 treatment sessions and remained stable at 12-month follow-up.

NET, explicitly developed for multiple traumas, has shown effectiveness with refugees with PTSD. As we have noted, much of the NET research has focused on refugees in and out of their home countries, in refugee camps, in their own homes, or in asylums (Robjant & Fazel, 2010). Robjant and Fazel (2010) found a decline in PTSD symptoms following NET that was maintained at post-treatment and follow-up assessments. The authors also note the low drop out rate in NET. However, while NET was developed for refugees and victims of war related crimes, Zang et al. (2013) recently found NET to be effective with Chinese survivors of a natural disaster, lending support to NET being effective on populations and traumas not related to refugees and victims of organized violence.

Table 3 provides a summary comparison of PE and NET in several domains.

5. Discussion

PE and NET share many features. Both are individual exposure therapies provided weekly (or twice weekly), that include psychoeducation and imaginal exposure, and both are based on Emotional Processing Theory and Learning Theory. Both typically have sessions that last 90 min, and neither requires the use of formal strategies of cognitive change (such as cognitive restructuring). Both require about the same amount of training for therapists. Both treatments have demonstrated effectiveness empirically through RCTs (18 in PE and 12 in NET) and other clinical trials that explicitly utilized the respective treatment

Table 3
Overall comparison of PE and NET.

Domain	Prolonged exposure	Narrative Exposure Therapy
Format	Individual (one-on-one) sessions, once or twice per week	Individual (one-on-one) sessions, once or twice per week
Theoretical Foundation	Emotional Processing Theory, Learning Theory	Emotional Processing Theory, Learning Theory, Testimony Therapy
Psychoeducation	X	X
Breathing Retraining	X	
In Vivo Exposure	X	
Imaginal Exposure	X	X
Recording of Each Session	X (Audio recording)	X (Written summary)
Assessment	Index trauma	Encourages full trauma history
Homework	X	
Narration (Beyond Traumatic Memory)		X
Lifeline (Physical Representation of Life Events)		X
Therapist Training	Four day workshop plus individual supervision on at least two cases	Three day workshop plus individual supervision (not specified)
Number of Randomized Controlled Studies (RCT) Conducted	18	12
Range (Mean) Subjects Per Trial in Identified Treatment	5 to 1816 (Mean = 104.63, Median = 40.5)	6 to 111 (Mean = 25.73, Median = 16)
Reported Length of Sessions	60 to 120 min (typical was 90 min)	60 to 150 min (typical was 90 min)
Reported Number of Sessions	7 to 21 (typical was 10 sessions)	4 to 14 (typical was 7 sessions)
“Dosage” (Time in Treatment, Including Estimated Homework Time)	Approximately 5100 min	Approximately 630 min
Average Drop Out Rate Across All Studies in Identified Treatment	27.20%	5.06%
Number of Studies with Majority of Non-Western Subjects	2 of 32 (6.67%)	14 of 15 (93.33%)
Number of Studies on Patients with Multiple Traumas vs. Single Traumas	19 not reported 1 multiple traumas 3 single traumas 9 multiple and single traumas	5 not reported 10 multiple traumas
Number of Traumas Typically Addressed in Treatment	One (index trauma)	All
Typical Resources Used	Therapist checklist and recording sheets to monitor exposures; writing implements, handouts and tracking sheets for clients, audio recorder, video medium and video player	Minimal paperwork (including paper for written narrative document), writing implement, materials for lifeline (often rope, sticks, and stones)

Note. For drop out analyses, only studies of the identified treatment were included (not treatments that combined the identified treatment with another treatment).

manuals (some of these using lay therapists). Many of the controlled trials for both treatments utilized active treatment control conditions.

PE and NET also have demonstrated differences. NET includes Testimony Therapy in its theoretical foundation, and it offers the creation of a physical lifeline (e.g., rope with markers) to represent the focus on a lifespan narrative. This lifespan approach includes all potential traumatic events as well as other significant events, whereas PE typically focuses on one traumatic event (identified as the “worst” event). During imaginal exposure, PE therapists encourage clients to use the present tense when describing the memory to help the client emotionally engage with that experience, whereas in NET therapists encourage the past tense when engaged in the narrative to foster a sense of history in a larger context. PE includes breathing retraining, in vivo exposure, and homework, whereas NET does not. Both treatments generate recordings of the traumatic events, but in PE these recordings are audio recorded and designed to be used only for the duration of treatment. In NET, the recordings are written by the therapist and used throughout treatment, but also to produce a document that is given to the client at the end of treatment (for therapeutic and potentially legal uses). PE has typically involved more sessions (typically 10, compared to 7 in NET) and about eight times the total time for treatment (typically about 5100 min, including homework, compared to 630 in NET).

Only two of the PE studies (6.67%) focused on participants from non-Western regions. About half of the PE trials were focused on individuals who had experienced combat or sexual assault, and nearly half of the trials had samples of military veterans. In NET, all but one of the studies (93.33%) focused on participants from non-Western regions. Over half of the NET trials focused on asylum seekers, refugees (including individuals displaced by war or natural disaster), or victims of genocide or other organized violence. None of the NET trials focused on combat by adults, and none focused exclusively on rape/sexual assault. None of the NET samples were comprised of adult military veterans, though one was focused on child soldiers.

Palic and Elklit (2010) suggested that exposure procedures aimed at a single trauma might be problematic for treating PTSD in refugees, and Nicholl and Thompson (2004) expressed concern that the results obtained with PE may not generalize to survivors of complex trauma. Moreover, multiple traumatization, rather than single traumatization, is typical. Kessler, Sonnega, Bromet, Hughes, and Nelson (1995) found that 64% of the trauma-exposed individuals who participated in the National Comorbidity Study reported more than one trauma exposure.

Indeed, many studies of PE have included participants who have experienced multiple traumatic events such as childhood sexual abuse or combat (e.g. McDonagh et al., 2005; Resick et al., 2003), but that information is not always detailed in the published reports. There are data that suggest that multiple exposures can increase individuals' chances of developing PTSD, and more comparative outcome data based on numbers of traumatic events could potentially aid in the process of treatment matching or treatment preparation. Paunovic and Öst (2001) found that an exposure program effectively reduced anxiety and depression in sample of refugees living within Stockholm (see also d' Ardenne, Ruaro, Cestari, Fakhoury, & Priebe, 2007; Otto et al., 2003). However, this study did not utilize the manualized PE protocol (and was thus excluded from inclusion in the present analysis). Thus, although promising, further research is needed to investigate if PE is an effective treatment for multiple and/or complex traumas in general, and refugees specifically.

Relatively few randomized controlled studies have investigated the effectiveness of PTSD treatments on non-western populations compared to western populations (Nickerson, Bryant, Silove, & Steel, 2011). Foa et al. (2000) point to the fact that little is known about treating PTSD in non-industrialized countries, and Crumlish and O'Rourke (2010) state that there is a lack of high quality research on refugees and PTSD. Indeed, all but three of the PE studies included in our analyses focused on participants in Western regions (mostly the U.S.). However, all but one of the NET studies have been conducted

with non-Western participants, and studies by e.g. Neuner et al. (2004) and Neuner, Catani, et al., (2008) lend support to NET being a treatment of choice for this population. Most NET studies have been conducted in low- to middle-income countries (Bichescu et al., 2007; Neuner, Catani, et al., 2008; Neuner, Onyut, et al., 2008; Neuner et al., 2004; Schaal et al., 2009), while some have been in high-income countries (e.g., Halvorsen & Stenmark, 2010; Neuner et al., 2010; Stenmark et al., 2013). NET's effectiveness in heterogeneous populations points to a possible cultural flexibility in the treatment, and augments evidence about the importance of exposure therapies in treating PTSD. As we noted, non-therapists have learned and applied both PE (Feske, 2008; Foa et al., 2013) and NET (Gwozdziwycz & Mehl-Madrona, 2013; Robjant & Fazel, 2010) successfully. This also grants flexibility in applying both treatments, as many regions (in industrialized and non-industrialized nations) face a shortage of psychotherapists.

PE and NET offer competing approaches to managing PTSD, and the differences invite theoretical clarifications and empirical testing. There have been no RCTs that directly compare PE and NET. Such a comparison, conducted within a relatively homogeneous sample (e.g., refugees or combat veterans) could help to elucidate any potential differences in outcomes (PTSD severity, PTSD diagnostic status, severity of comorbid anxiety and depressive symptoms, drop-out rates, rate of change, etc.). NET is generally briefer, with no homework assigned to participants, and it requires fewer physical resources. If outcomes are comparable, NET may offer a more streamlined approach. In the absence of a direct comparison between the treatments, it would be informative to test the effectiveness of PE in samples of refugees and to test NET in samples of sexual assault survivors or combat veterans to note any differential outcomes. Component analyses could also investigate the relative effects of producing a written document at the end of treatment, of focusing on one versus multiple events, or of using the past or present tense in narratives. Studies could potentially investigate differential outcomes for individuals with complex trauma as well. NET strongly emphasizes the construction of the autobiographical narrative while PE typically focuses on one primary index trauma. Although it has been suggested that creating a complete narrative may not be necessary in order to achieve a therapeutic effect (Brewin, 2001), this remains an empirical question. If data suggest that the narrative provides a significant independent contribution to change in anxiety, perhaps via mechanisms other than the habituation mechanism of exposure, this may potentially impact conceptualizations of PTSD treatment. It is also possible that elements of treatment present in PE, such as breathing retraining and in vivo exposure exercises, are crucial components of treatment that are not fully accounted for in the model of NET.

6. Future directions

PTSD is often described as a chronic disorder, with up to one third of clients experiencing PTSD many years after the traumatic incident (Cukor et al., 2010). In reviewing treatments for PTSD, Bradley et al. (2005) highlight how clients often suffer from residual symptoms after treatment. In treating chronic PTSD, exposure sometimes leads to improvement but not complete recovery, based on the 25–45% that still meet the criteria for PTSD (Van Minnen et al., 2002).

There is evidence that both PE and NET can be effective in alleviating PTSD symptoms, although extant research has focused on different populations and traumas. As we have suggested, given that both interventions were developed and thus far conducted on fairly specific populations, one avenue for future research is researching each intervention's effect on diverse populations. That is, PE could be evaluated in populations such as refugees or asylum seekers suffering from multiple and complex traumatization, including individuals living in insecure and high-risk environments. This could reinforce PE as a first line treatment for a broader range of trauma victims. NET may benefit from more research on populations in Western countries. While NET has been tested in the specific population of refugees, several questions

pertaining to efficacy remain. It is important to determine how well this intervention works in individuals with other types of trauma exposure, including single event exposures. In addition, given that researchers affiliated with VIVO have conducted most NET studies, replication by other independent research groups is needed. This increase in the methodological rigor of the body of literature on NET would increase confidence in effectiveness of this intervention as a whole. This information would also indicate whether or not each intervention could present a viable alternative treatment option. For example, if NET is effective across populations, it could be a good treatment for individuals currently at heightened risk (such as those who remain in relationships with intimate partner violence), who might otherwise not complete interventions like PE.

It is possible that complex traumatization leads to severe symptoms associated with other types of pathology than PTSD, such as dissociative disorders or personality disorders such as borderline personality disorder (Vermetten & Spiegel, 2014). Future research investigating NET on these populations might expand NET as an evidence-based treatment for a broader range of disorders associated with complex traumatization. Instruments used in the studies included in this paper are primarily targeted towards PTSD symptomatology, such as the Clinician Administered PTSD Scale. According to Palic and Elklit (2014), refugees often experience symptoms beyond the diagnostic criteria associated with the current PTSD diagnosis in the DSM and the ICD, and some symptoms might be better described by personality disorders. Comparing NET and PE on such complex traumatization might expand our current knowledge on effective psychotherapies for a broader range of survivors of complex trauma.

Understanding the impact of the intervention components might allow for greater personalization of care. For example, if a client has suffered from a single trauma, is it still necessary to construct a narrative from birth to present? Given the heavy emphasis on narration and memory, is NET a superior alternative for an individual who shows particularly fragmented memory related to the trauma(s)? Is PE a better choice than NET for an individual who relies heavily on avoidant coping given the greater dose of exposure? Future data carefully examining the critical pieces of these interventions and the potential prediction of response based on theorized mechanisms may begin to answer these types of questions.

An additional consideration to guide future research is the consideration of client preference and pragmatic barriers to treatment, as well as related issues of treatment compliance and drop out. It is proposed in the NET literature that this type of intervention may be more culturally adaptable and acceptable to individuals in refugee countries in part due to the oral tradition that is tapped in creating the lifeline and personal narrative. However, the acceptability and ability to practically execute NET versus PE in specific populations has not yet been directly examined. This information may be important for determining the general acceptability of an intervention and willingness to complete the intervention (insofar as beliefs about treatment impact individuals' interest in completing a specific intervention), as well as the client's actual completion of the therapy components presented by the therapist. There is a paucity of evidence exploring preference factors that influence whether or not the client completes sessions and assignments within treatment in both NET and PE. However, given preliminary evidence that treatment dose is important for outcomes (Ready, Sylvers, Worley, Butt, & Mascora, 2012), exploring the relationship between treatment acceptability, completion, and compliance appears to be critical for both interventions. Interventions that are more palatable to the individual may be more likely to be completed as intended.

7. Conclusions

The goal of the present review was to explore the differences and commonalities between PE and NET, and also investigate their approach to multiple and complex traumas. The differences between NET and PE

may be essential mechanisms of action in the treatments. PE and NET could mutually inform one another, and that this may increase our general knowledge on both posttraumatic reactions and the treatment of PTSD.

Reviewing the available research on PTSD, it seems evident that PE's status as a first line treatment for the populations studied is warranted. Nonetheless, it is important to take into account the role of emerging treatments for PTSD, such as NET, in contributing to the growing knowledge on treating the disorder and its comorbid features. NET has made great strides in integrating components of therapy that are known to be efficacious (e.g., imaginal exposure) and novel components, and has made an especially strong mark by testing the treatment empirically in relatively disadvantaged populations.

Since most research on the efficacy of PE is conducted on victims who have experienced several traumatic incidents, it is reasonable to assume that much of the knowledge base on treating PTSD has included complex traumatization. However, the limitations on the current PE research, such as limited or non-existent research outside the US and studies on refugees and asylum seekers, limits knowledge of PE's efficacy for a broader range of PTSD clients. In reviewing the literature as a whole, some preliminary recommendations for therapists emerge. First, a substantial body of literature supports the use of PE for individuals who experience single index traumas, such as sexual assault and motor vehicle accidents, as well as more complex events like abuse and combat. Exposure-based interventions are considered the first-line intervention for many of these individuals given the strong empirical support for this treatment's efficacy. However, there are also specific circumstances under which it may be more advantageous to use NET. Specifically, for individuals who are refugees or have experienced traumatization as civilians in a war zone, culturally adapted CBT treatments such as NET have relatively more backing in the empirical literature (Nickerson et al., 2011). NET was designed specifically for use in these settings, and the pragmatic execution of the intervention is may be better suited for this type of population. For asylum seekers and refugees, NET has a strong evidence base, and for this population NET should be a recommended treatment. However, there is still a relative paucity of data on treatment in refugees. Thus, future research is needed to more comprehensively establish best practices for treatment of PTSD in these individuals.

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