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Narrative Reconstruction as an Intervention for Posttraumatic Stress Disorder: A Pilot Delayed Intervention Quasi-Randomized Controlled Trial

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Although empirically supported treatments for posttraumatic stress disorder (PTSD) exist, many patients fail to complete therapy, are nonresponsive, or remain symptomatic following treatment. This paper presents the results of a delayed intervention quasi-randomized controlled study that evaluated the efficacy of narrative reconstruction as an integrative intervention for PTSD. During narrative reconstruction, the patient and therapist reconstruct an organized, coherent, and detailed written narrative of the patient's traumatic experience. Additionally, narrative reconstruction focuses on arriving at the subjective meaning of the traumatic experience for the patient as related to their personal history. Thus, the therapist asks the patient about associations between the traumatic event and other memories and life events. In the present study, 30 participants with PTSD were randomly assigned to an immediate ($n = 17$) or delayed ($n = 13$) 15-session narrative reconstruction intervention. Participants in the immediate narrative reconstruction group were evaluated using self-report measures and structured interviews at baseline, posttreatment, and 15-week follow-up. Participants in the delayed narrative reconstruction group were evaluated at baseline, postwaitlist/pretreatment, and posttreatment assessments. Data from the pretreatment evaluation showed no significant differences between groups. Mixed linear models showed significant intervention effects for posttraumatic symptom severity, $d = 1.17$, from pre- to posttreatment. Although preliminary, these promising findings suggest that narrative reconstruction may be an effective standalone therapy or an add-on to current effective treatment strategies.

Several evidence-based treatments for posttraumatic stress disorder (PTSD) are currently available (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013; Bradley, Greene, Russ, Dutra, & Westen, 2005; Cusack et al., 2016; Schnyder et al., 2015; Watts et al., 2013). Effective psychotherapies for Type I (i.e., single incident) trauma exposure include cognitive therapy, exposure therapy, and eye movement desensitization and reprocessing (Watts et al., 2013) and, more recently, narrative-based interventions (Mørkved et al., 2014; Sloan, Marx, Lee, & Resick, 2018). Bradley et al. (2005) concluded that most patients treated with psychotherapy in randomized trials recover or improve. Nevertheless, in a review of outcome research, Schottenbauer, Glass, Arnkoff, Tendick, and Gray (2008) found that nonresponse rates as high as 50% were relatively common. It is unclear whether these positive randomized-trial results can be translated into community settings (Bradley et al., 2005; Najavits, 2015) in which completion rates of only 28% (Zayfert et al., 2005) have been reported. In addition, the definition of dropout varies among studies: Some studies include noninitiators who consent to treatment but never begin therapy, whereas others include only individuals who drop out once treatment has begun or end treatment prior to completion of all sessions that are part of the treatment protocol (Imel, Laska, Jakupcak, & Simpson, 2013; Szafranski, Smith, Gros, & Resick, 2017). This inconsistency complicates the interpretation of dropout rates. Regardless of the precise rate, dropout is a serious problem. Clinicians and researchers have stressed the need for the development of new therapeutic interventions that might enhance patients' motivation to initiate and complete therapy (Schnyder et al., 2015; Yehuda & Hoge, 2016). As a result of these assertions, we developed narrative reconstruction (NR; Peri & Gofman, 2014) as an intervention for PTSD that may be better tolerated, in terms of dropout rate, and easily disseminated.

Narrative reconstruction is a short-term intervention that typically ranges from 12 to 15 sessions, with each session lasting 50 min. The treatment incorporates the most salient ingredient of effective interventions for PTSD (Schnyder et al., 2015); that is, exposure to the traumatic memory. However,

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the exposure is more gradual, with only small segments of the traumatic memory discussed in each session. Narrative reconstruction also includes systematically working with the patient to recall the trauma in detail and reconstruct a complete, organized, and coherent narrative of the trauma. The narrative work resembles other evidence-based interventions, such as cognitive processing therapy (CPT; Resick, Nishith, Weaver, Astin, & Feuer, 2002), narrative exposure therapy (NET; Neuner, Schauer, Klaschik, Karunakara, & Elbert, 2004; Schauer, Schauer, Neuner, & Elbert, 2011), and written exposure therapy (WET; Sloan, Marx, & Resick, 2016). However, in NR, unlike in CPT and WET, working on and writing up the narrative is done exclusively in the presence of the therapist to facilitate the patient's tolerance of the process and make the exposure more bearable. This procedure is in line with preliminary evidence showing that writing trauma narratives during sessions rather than outside of sessions (i.e., without the presence of a therapist) contributes to a reduction in dropout rates (Holmes et al., 2019; Sloan, Marx, Lee, & Resick, 2018). The gradual exposure to trauma memory is also consistent with recent recommendations for gradual in vivo exposure and gradual increases in homework demands during prolonged exposure (Brown, Zandberg, & Foa, 2019) and trauma-focused cognitive behavioral therapy (Cohen, Mannarino, & Deblinger, 2017).

As for NET, NR resembles this intervention in its incorporation of exposure elements through work on writing the trauma narrative and organizing this narrative along a timeline. Yet, NR also differs from NET in several ways. In NR, the reconstruction is done frame by frame and includes the patient's full range of actions, sensations, thoughts, and emotions. The text is read aloud by the therapist during each session, allowing the patient to focus their attention on the narrative and, thereby, allowing the patient to more fully flesh out the narrative each time, the goal being to put into written words the full array of the patient's emotional experience. During the reconstruction, the therapist explores associations to other memories and traumatic experiences, and they attempt, together with the patient, to uncover the personal meaning of the trauma exposure (Ehlers & Clark; Krupnick, 2002; Peri & Gofman, 2014). The result is a significantly more detailed and more contextualized narrative than would otherwise be obtained. In our study, NR produced 13–15 pages of narrative for each patient.

The theoretical foundation of NR is presented in detail in a previous publication (Peri & Gofman, 2014) and is presented here in a condensed manner. We perceive PTSD as a complicated disorder that involves impairment of both learning and memory systems. To reduce the impact of fear conditioning networks, as elaborated by emotional processing theory (Foa & Kozak, 1986), NR contains an element of repeated exposure to the traumatic memory in a safe therapeutic environment. In addition, NR contains an element of contextualization of the traumatic memory. Memory impairment in PTSD is manifested in the uncontrolled intrusive memories of fragments of the traumatic experience together with gaps and disorganization in the trauma memory, which are expressed in disorganized and incoherent trauma narratives (Brewin, Gregory, Lipton, & Burgess, 2010). Although some researchers have posited that there is a lack of incoherence and disintegration in PTSD patients' memories (Rubin et al., 2016), we follow the less controversial view that in PTSD, traumatic memories are impaired and unintegrated, particularly in the highly emotional, intense parts of the traumatic narratives (Foa et al., 1995; Ehlers & Clark, 2000; Jelinek, 2010; Brewin, 2016). Neurobiological models of PTSD attribute these memory impairments to the highly stressful conditions during the encoding of the traumatic event, which, in turn, lead to a deficit in contextual learning such that trauma exposure seems to result in the individual's enhanced memory of specific sensory aspects as well as their relative inability to locate the event within its temporal and spatial circumstances (Brewin, 2011). Thus, NR aims to put trauma exposure into its context of time and space in a detailed manner through the reconstruction process. Cognitive and psychoanalytic theories argue that discrepancies between the traumatic event and assumptions or beliefs about oneself and the world add to the difficulties of integrating the traumatic memory into the general autobiographical memory (Brewin, 2011; Rathbone, Conway, & Moulin, 2011). Accordingly, in NR, the therapist asks for associations with previous memories. For example, one female patient avoided swimming pools and beaches because of a near-drowning experience in a water park when she was a teenager. During NR, the primary feeling that emerged was one of not being noticed while she was struggling in the water. Upon asking her about similar memories, she talked about feelings of abandonment, which she had experienced as a young child when her parents had gotten divorced. This awareness contextualized her fear of water and helped her to tolerate her fear-based memory.

The basic structure of NR revolves around the systematic reconstruction of the trauma memory along a chronological timeline. The first session is devoted to psychoeducation about PTSD and traumatic memories. The patient is asked to talk about their senses, thoughts, emotions, and actions, frame by frame, as the story unfolds. The NR setting differs from common exposure therapies in that the therapist, sitting face-to-face with the patient, is also typing the narrative on their laptop, word for word. Although there are benefits to the patient writing about the trauma themselves (Pennebaker, 1997; Sloan et al., 2016), the fact that the therapist is doing the writing increases the patient's capacity for self-focus and emotional involvement (Brewin & Lennard, 1999). This unique setup has, in our opinion, several advantages. First, the computer may contribute to the patient's feeling of giving testimony regarding the traumatic event rather than "being exposed" to the traumatic event. The therapist typing the narrative also relays the message to the patient that every word is valuable (Peri, Gofman, Tal, & Tuval-Mashiach, 2015). Furthermore, the pace of the exposure is inevitably slowed down, as the therapist has to type every word; this slower pace naturally provides the patient with more time to process the anxiety-provoking parts of the story. Although these advantages may be similarly achieved by hand-writing the narrative, on a practical level, the laptop also

allows the therapist to easily make additions and/or changes to the narrative given that it is reviewed and potentially amended at each subsequent session.

The therapist begins each session by reading aloud the narrative that was written in the previous session. Work on the narrative begins with a description of the day of the event, before the actual trauma occurrence. At this stage of NR, the emotional responses are still moderate; consequently, it is an opportunity to clarify the working method in detail and orient the patient into the setting. The therapist puts a special emphasis on the period of time before and immediately after the traumatic event so the patient and therapist together can examine the broader framework in which the trauma occurred; in this way, potential connections to the subjective emotional experience are elicited. During the NR, there may be moments or longer periods of time during which it is clear that the memory of the events is impaired and, as a result, there is a lack of information. These gaps are recorded and an effort is made to go back to them during future sessions or when the patient recalls the missing information. The narrative continues until the point during the traumatic event at which the person regained composure and a sense of control. The therapist may also reframe the patient's behaviors or relate them to past experiences in their life to deal with guilt, other feelings, or with what seems like exaggerated emotional responses to details of the trauma. In addition to the integration of the trauma memory, part of the process involves the therapist and patient working together to uncover the personal meaning and significance of the traumatic experience for the patient, as demonstrated in the clinical example of the woman with the fear of water. In most cases, patients' perceptions of the events during the traumatic experience and their emotional responses to them gain new meaning through this process, and dissociated facts and feelings are revealed. In the final session of NR, the patient is handed a printed copy of their narrative.

The current study took place in light of the promising results that emerged from a proof-of-concept open trial (Peri & Gofman, 2014), in which six consecutive patients showed a significant reduction in PTSD and depressive symptoms (Clinician-Administered PTSD Scale [CAPS]: $d = 1.66$; Beck Depression Inventory–Revised [BDI-R]: $d = 0.99$). Expanding upon the proof-of-concept study, the aim of the present pilot research was to examine the effectiveness of NR as an intervention for individuals with a current primary diagnosis of PTSD in a delayed, quasi-randomized controlled study in which participants were assigned to either an immediate or delayed NR intervention. We expected that participants who were randomly assigned to the immediate NR group would show significant clinical improvement in PTSD symptom severity relative to participants assigned to the delayed NR condition. We also expected that individuals in the delayed NR group would achieve improvement similar to those in the immediate NR group upon receiving treatment (i.e., after the completion of the waiting period). Previous studies have demonstrated the efficacy of exposure-based therapy for PTSD in the reduction of depressive symptoms (Jayawickreme & Blackie, 2014; Schnyder, Moergeli, Trentz, Klaghofer, & Buddeberg, 2001); we expected to find a similar pattern of results for the two groups, as detailed regarding PTSD symptoms, with respect to a reduction in depressive symptoms.

Method

Participants

Inclusion criteria were: having a current chronic PTSD diagnosis with symptom severity of over 45 on the CAPS, agreeing not to receive any other kind of psychotherapy for PTSD during the trial, being between 18 and 70 years of age, and having experienced a Type I trauma. Exclusion criteria were having a brain injury, psychosis, severe depression with suicidal ideation that posed an imminent danger, substance dependence, severe dissociation, and/or Type II/complex PTSD (CPTSD; i.e., stemming from repeated and prolonged trauma exposure). Comorbidity and exclusion criteria were assessed using the Structured Clinical Interview for *DSM-IV* (SCID; Shalev, Freedman, Peri, Brandes, & Sahar, 1997). Between 2012 and 2015, 30 participants ($n = 17$ women) who met the eligibility criteria were included in the study.

Participants presented with a wide range of PTSD-triggering traumatic events, including motor vehicle accidents ($n = 11$, 36.7%), sexual assaults ($n = 8$, 26.7%), terror attacks (, n = 6, 20.0%), and "other" types of traumatic events ($n = 5$, 16.7%), including witnessing the death of a family member, combat-related incidents (e.g., shooting or explosion), and medical trauma. In total, 16 participants (53.0%) had previously received psychotherapy for trauma exposure. Additionally, 18 participants (60.0%) had a comorbid Axis I diagnosis, including major depressive disorder (MDD; $n = 16$), generalized anxiety disorder (GAD; $n = 2$), and agoraphobia ($n = 1$). There were 18 participants who were actively taking psychotropic medications; no changes in medication regimens were made during the study. Pretreatment evaluations showed no significant difference between the groups regarding age (immediate NR: $M = 38.6$, $SD = 12.9$; delayed NR: $M = 41.9$, $SD = 13.9$) $t(28) = 0.30$, $p = .770$, nor concerning other demographic characteristics (i.e., gender, trauma type, comorbidity, psychotropic medication, and previous psychotherapy; see Table 1). There was also no significant difference in the number of years that had elapsed since the traumatic event (immediate NR: $M = 9.7$, $SD = 12.6$; delayed NR: $M = 4.3$, $SD = 4.7$), $t(28) = 1.45$, $p = .1596$

Procedure

The study was conducted in Israel at the Community Clinic of the Psychology Department at Bar Ilan University. The clinic is open to the public and treats children, adolescents, and adults at a subsidized cost. The study was approved by the institutional review board at Bar Ilan University and by the Helsinki Ethics Committee of Mayanei HaYeshua Medical Center. All

Table 1
Demographic Characteristics of the Sample, by Group

	Immediate NR ($n = 17$)			Delayed NR ($n = 13$)				Comparison test ($N = 30$)		
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*df*	χ^2	*t*	*p*
Gender							1	0.42		.519
Female	11			6						
Male	6			7						
Age (years)		38.6	16.9		41.9	13.9	28		0.30	.770
Time since trauma (years)		9.7	12.6		4.3	4.7	28		1.45	.159
Trauma type							3	4.11		.249
MVA	8			3						
Terrorist attack	3			3						
Sexual assault	1			4						
Other	5			3						
Comorbidity							3	3.74		.291
MDD	6			9						
GAD	2			1						
Agoraphobia	1			0						
None	8			3						
Pharmacotherapy						1	0			1.000
Yes	10			8						
No	7			5						
Previous Psychotherapy							1	1.34		.247
Yes	7			9						
No	10			4						

Note. NR = narrative reconstruction; MVA = motor vehicle accident; MDD = major depressive disorder; GAD = generalized anxiety disorder.

participants provided written informed consent. Participants were recruited from applicants seeking treatment at the clinic; data were collected between 2012 and 2015. Applicants deemed potentially eligible for the study after a brief initial phone screening, were invited for a more extensive, in-person clinical assessment (Time 1 [T1]), which included two parts. In the first session, held with the study coordinator, applicants received a detailed explanation of the study's course and gave written consent; they then underwent an unstructured interview regarding the traumatic events they had experienced and completed a general psychiatric assessment via the Hebrew version of the SCID (Shalev, Freedman, Peri, Brandes, & Sahar, 1997). The entire SCID was implemented to assess comorbidity and exclusion criteria. In the second interview, a trained clinical examiner conducted a clinical interview to verify the presence of PTSD based on criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*) via the CAPS (Blake et al., 1990; see Measures section for details). At the end of the interview, applicants were asked to complete a set of questionnaires. Figure 1, presents a CONSORT diagram of participant flow. Of the 66 initial applicants, PTSD was not the primary disorder in 14 cases, and another 14 individuals did not meet the diagnostic criteria for PTSD. In addition, three patients had been referred for rehabilitative therapy due to severe dissociation, and, as such, our clinical judgment was that exposure-based therapy would be potentially harmful (Cloitre et al., 2011); three additional patients declined treatment, and two patients had CPTSD. The remaining 30 participants were assigned either to the immediate NR condition ($n = 17$) or the delayed NR condition ($n = 13$) in a quasi-randomization process in the order in which they had been recruited for the study. Participants assigned to the delayed NR condition were asked not to engage in psychotherapy during the waiting period and, when they began treatment, were asked if they had participated in other treatments during the 15-week waiting period. Participants in the delayed NR group were encouraged to contact the project coordinator if they experienced a substantial worsening of their PTSD symptoms during the waiting period. Participants were unaware of the study hypotheses and were instructed not to reveal their condition assignment or study assessment period to the independent evaluators before each assessment. Two participants who had been originally randomized to the delayed NR condition experienced a significant worsening of PTSD symptoms and asked for help immediately after the initial assessment. For ethical reasons, they were transferred to the immediate NR condition so they could receive treatment immediately. A

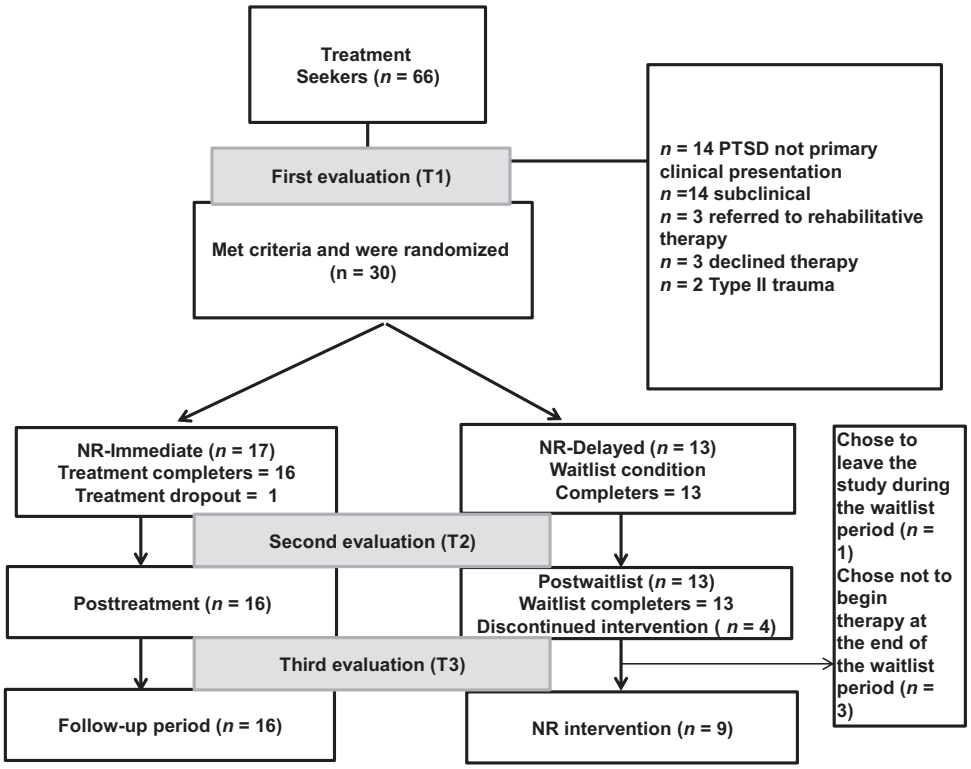

Figure 1. Recruitment and retention flowchart based on CONSORT guidelines (Schulz, Altman, & Moher, 2010). PTSD = posttraumatic stress disorder; NR = narrative reconstruction.

sensitivity analysis showed that including these two participants in the immediate NR group rather than the delayed NR group did not significantly affect the study findings. Independent assessments were conducted for all participants at baseline (T1), 15 weeks postbaseline (Time 2 [T2]; i.e., posttreatment for immediate NR, pretreatment for delayed NR); and 30 weeks postbaseline (Time 3 [T3]; i.e., follow-up for immediate NR, posttreatment for delayed NR).

The evaluators who performed the assessments were masters-level clinical psychology students who had been individually trained and supervised by highly experienced trainers in the use of the CAPS and SCID and were blind to the group allocation of the participants. Initial assessments were performed together with a senior clinician to verify fidelity. Treatment was provided by predoctoral clinical psychology interns. Study therapists worked with a written protocol and received weekly group supervision and individual supervision, by authors Tuvia Peri and Ilanit Hasson Ohayon, for their first cases. The group supervision included the discussion of transcripts and case materials to ensure adherence to the treatment protocol, and a sample of treatment sessions was recorded and videotaped to ascertain fidelity to the therapy manual. Participants assigned to the immediate NR group began 15 weekly, 50 min sessions, and participants assigned to the delayed NR group waited an equal period of time without any intervention.

At the end of the NR treatment, the immediate NR group participated in the posttreatment assessment (i.e., T2). Participants assigned to the delayed NR condition also participated in the second assessment at the end of their 15-week waiting period, after which they received 15 weekly therapy sessions identical to those received by those in the immediate NR group. In the delayed NR group, one participant chose to leave the study during the waiting period, and although three additional participants completed the post–delayed NR evaluation at T2, they chose not to begin therapy at the end of the waiting period, saying that they were no longer interested in receiving treatment. The four people who discontinued the study did not differ from the rest of the group in terms of demographic characteristics, trauma type, or symptom severity. By the end of the study, a total of 25 of the original 30 participants had received treatment.

Measures

Psychiatric disorders. (SCID; Shalev, Freedman, Peri, Brandes, & Sahar, 1997) The SCID is a semi-structured interview used to assess 33 of the more commonly occurring psychiatric disorders described in the *DSM-IV-TR* (American Psychiatric Association, 1994). The measure allows experienced clinicians to phrase questions in ways that will be most comprehensible for and tailored to the individual patient; it also allows clinicians to ask additional questions that clarify ambiguities, challenge inconsistencies, and aid in making clinical judgments about the seriousness of symptoms. The Hebrew

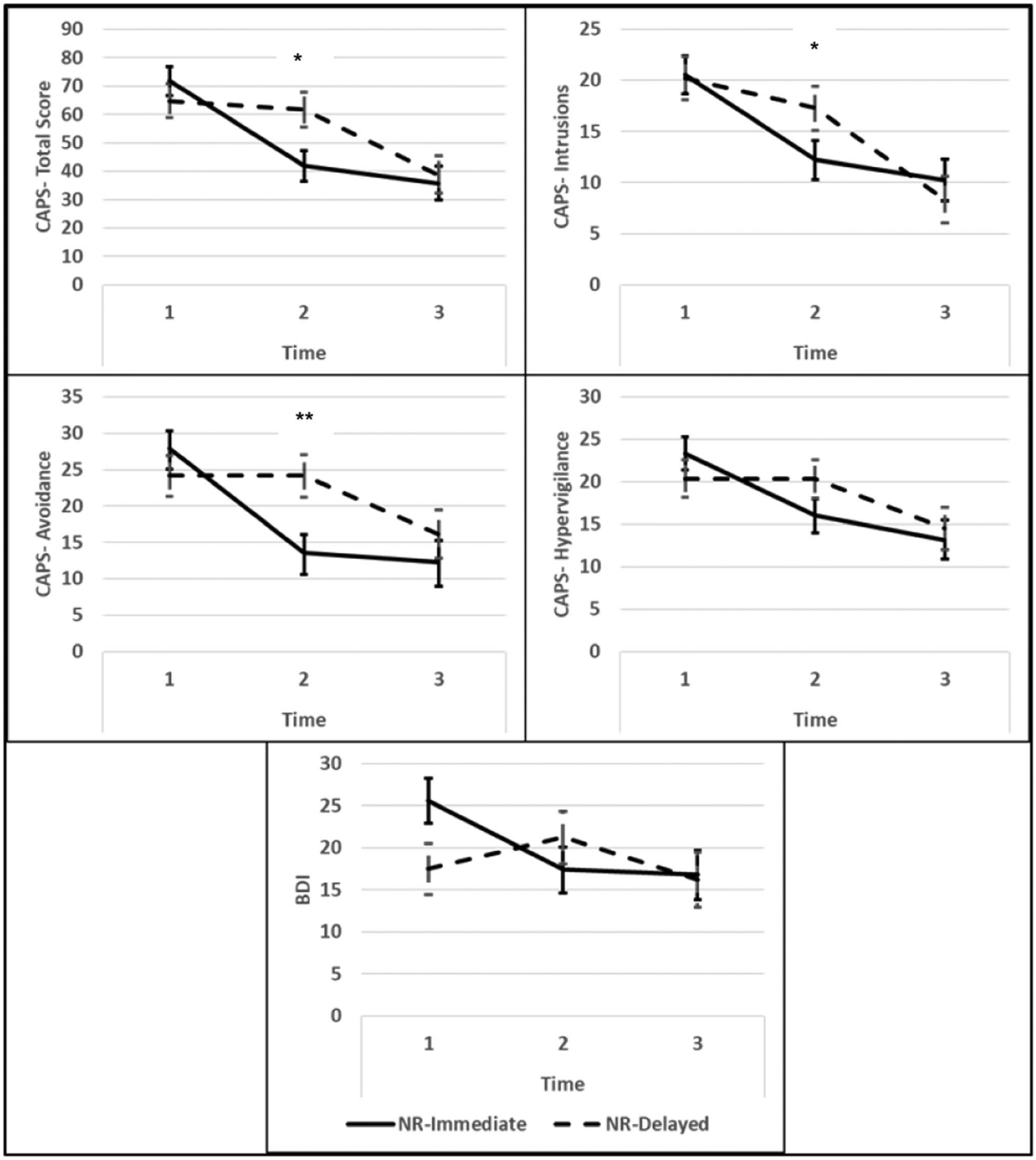

Figure 2. Mean symptom scores as a function of condition and time. CAPS = Clinician-Administered PTSD Scale; BDI-R = Beck Depression Inventory–Revised; NR = narrative reconstruction. $*p < .05$. $**p < .01$.

version of the SCID (Shalev et al., 1997) was used as a tool for diagnostic evaluation and clinical comorbidity.

PTSD diagnosis and symptoms. The CAPS (Blake et al., 1990) is used to assess the 17 core symptoms of PTSD, as defined by the *DSM-IV*, and to evaluate associated affective features. The CAPS yields both a total score and scores for three different subscales: Intrusions, Avoidance, and Hyperarousal. The CAPS has demonstrated a sensitivity of .81 and a specificity of .95, and test–retest reliability has been reported to be between .90 and .96 over a 1-week period (Weathers et al., 2001). The CAPS has shown excellent convergent and

discriminant validity, diagnostic utility, and sensitivity to clinical change (Weathers et al., 2001). The CAPS has demonstrated high internal consistency (Cronbach's αs = .87–.95; Hyer, Summers, Boyd, Litaker, & Boudewyns, 1996). The Hebrew translation (Shalev et al., 1997) has been used extensively in previous studies in Israel. In the present study, CAPS subscale scores were highly correlated with total scores, *r*s = .82–.89, and, to a lesser extent, with one another, *r*s = .55–.65, at baseline. The reliability was high for the total PTSD scale, Cronbach's α = .90, and good for the subscales, Cronbach's αs = .72–.79.

Depressive symptoms. The BDI-R (Beck, Steer, & Brown, 1996). The BDI-R is a 21-item, self-report measure that is used to assess the severity of depression in adolescents and adults. The BDI-R has shown high validity and reliability scores and high internal consistency (Cronbach's αs = .81–.86; Beck, Steer, & Carbin, 1988). The Hebrew version of the BDI-R has been used extensively in studies in Israel and has shown good-to-excellent internal reliability (Levav, 2009). In the present study, the reliability of the total BDI-R depression scale was high, Cronbach's α = .90.

Data Analysis

G*Power (Version 3.1 software) was used to approximate the statistical power of the analyses given the sample size. The power of analyses that examined group differences in symptom change (i.e., Group × Time interaction term) was approximated using formulas for repeated-measures designs with two groups and three repeated assessments (pretreatment, posttreatment, and follow-up). These analyses showed that a total sample size of 28 would be needed to detect a medium effect (i.e., Cohen's $d = 0.50$) at a power of .80. A medium effect size was chosen as an estimate of the effect of active treatment compared to a waitlist control, which is relatively conservative compared to the average effect (i.e., $d = 1.11$) reported in a meta-analysis of psychotherapies for PTSD (Bradley et al., 2005). Thus, these results suggested that the statistical power was adequate for our analyses.

The data were analyzed using multilevel models (MLM) using SAS PROC MIXED, which takes into account the non-independence of the repeated assessments and accommodates missing data, resulting in a full intent-to-treat analysis (Bolger, Stadler, & Laurenceau, 2012; Hoffman, 2015). Specifically, the following models were estimated for each outcome (i.e., CAPS total score, three CAPS subscales, and BDI-R):

$$\text{Outcometi} = \beta 0 + \beta 1 * \text{Timeti} + \beta 2 * \text{Groupi} + \beta 3 * \text{Timeti} * \text{Groupi} + \text{U0i} + \text{eti}$$

whereby the outcome for client i at time t was predicted by the sample's intercept (β0), the effect of Time (β1), Group (β2), and their two-way interaction (β3), as well as by two residual terms (i.e., random effects), one expressing between-subject variance (U0i) and the other expressing within-subject variance (eti). For all models, we expected significant group differences at T2 (i.e., after the immediate NR group completed treatment but before the delayed NR group began treatment) but not at T1 and T3 (i.e., before and after both groups completed treatment, respectively). Effect sizes were estimated using the R (R Core Team, 2015) package "effect size" (Torchiano, 2015). In total, 15.7% and 12.8% of the observations were missing in the immediate NR and delayed NR groups, respectively. Missing data were handled by using multilevel models with restricted maximum likelihood estimation, which uses all available data and provides intent-to-treat analyses that are relatively robust to missing data. Differences in the groups' marginal means were estimated with the least-squares means (LSMEANS) statement of PROC MIXED (See Hoffman, 2015). The pseudo R^2 value for the model was calculated according to the recommendations outlined by Hoffman (2015).

Results

The results of the multilevel models and the estimated marginal means, with standard errors, based on these models are presented in Tables 2 and 3, respectively. As shown, in the model predicting participants' CAPS total score, the predicted Group × Time interaction was significant. As shown in Figure 2, the groups' CAPS total scores did not differ significantly at T1 (i.e., before both groups underwent treatment), Est. = 7.00, $SE = 7.81$, $p = .375$, $d = 0.32$, 95% CI [−0.44, 1.08]; however, at T2 (i.e., posttreatment for immediate NR; postwaitlist for delayed NR) the total CAPS scores for the immediate NR group were significantly lower compared to the total CAPS scores for the delayed NR group, Est. = −19.82, $SE = 8.08$, $p = .018$, $d = -1.17$, 95% C1 [−2.03, −0.31]. At T3 (i.e., after both groups underwent treatment), the total CAPS scores did not differ significantly between groups, Est. = −2.99, $SE = 8.87$, $p = .738$, $d = -0.16$, 95% CI [−1.11, 0.78].

Similarly, in the models predicting participant scores on the CAPS Intrusion and Avoidance subscales, the predicted Group × Time interaction was significant. As shown in Figure 2, the CAPS Intrusion and Avoidance subscale scores did not differ significantly between groups at the T1, Est. = 0.30, $SE = 2.81$, $p = .916$, $d = 0.04$, 95% CI [−0.72, 0.79], for Intrusions; Est. = 3.73, $SE = 3.75$, $p = .326$, $d = 0.39$, 95% CI [−0.37, 1.15], for Avoidance. The scores also did not differ at T3 between groups: Est. = 1.89, $SE = 3.08$, $p = .542$, $d = 0.31$, 95% CI [−0.64, 1.26], for Intrusions; Est. = −3.84, $SE = 4.45$, $p = .393$, $d = -0.33$, 95% CI [−1.28, 0.62], for Avoidance. However, at T2, CAPS Intrusion and Avoidance subscale scores were lower—significantly for avoidance and marginally for intrusions—among participants in the immediate NR group, Est. = −5.05, $SE = 2.88$, $p = .087$, $d = -0.83$. 95% CI [−1.66, 0.00], for Intrusions; Est. = −10.64, $SE = 3.92$, $p = .010$, $d = -1.26$, 95% CI [−2.14, −0.39], for Avoidance. In the model predicting scores on the CAPS Hypervigilance subscale, the predicted Group × Time interaction was not significant. Although the interaction for the Intrusions and Hypervigilance

Table 2
Mixed-Model Regression Analyses for Testing the Effects of Group and Time on Measures of Posttraumatic Stress Disorder (PTSD) and Depression, with Pseudo R^2 Effect Size Metrics in Mixed-Effects Models

	Time		Group		Time × Group		
Variable	$F(2, 43)$	p	$F(1, 28)$	p	$F(2, 43)$	p	Pseudo R^2
CAPS total	28.65	< .001	0.60	.446	6.55	.003	.34
CAPS Intrusion	42.46	< .001	0.14	.716	4.9	.012	.33
CAPS Avoidance	12.43	< .001	1.45	.228	5.30	.005	.28
CAPS Hypervigilance	11.46	< .001	0.13	.723	2.91	.065	.18
BDI-R	4.53	< .001	0.19	.669	8.13	.001	.12

Note. CAPS = Clinician-Administered PTSD Scale; BDI-R = Beck Depression Inventory–Revised.

subscales was not significant, the general decline in symptoms between pre- and posttreatment for all participants who received NR was significant for all subscales: $t(23) = 7.2$, $p < .001$, $d = 1.05$, 95% CI [0.68, 1.41] for Intrusions; $t(23) = 4.41$, $p < .001$, $d = 1.16$, 95% CI [0.48, 1.48] for Avoidance; and $t(23) = 4.13$, $p < .001$, $d = 0.76$, 95% CI [0.24, 1.19] for Hypervigilance.

Finally, in the model predicting BDI-R scores, the Group × Time interaction was significant but not in the predicted direction. Specifically, at T1, BDI-R scores for participants in the immediate NR group were marginally higher than those for participants in the delayed NR group (Figure 2), Est. = 8.13, $SE = 4.05$, $p = .051$, $d = 0.76$, 95% CI [−0.03, 1.54]. However, BDI-R scores did not differ significantly between groups at T2, Est. = −3.82, $SE = 4.\ 15$, $p = .362$, $d = -0.52$, 95% CI [−1.33, 0.29]; or at T3, Est. = 0.59, $SE = 4.41$, $p = .895$, $d = -0.21$, 95% CI [−1.16, 0.74]. It is interesting to note that, for both participants in both groups, a significant reduction in BDI-R scores occurred from pre- to posttreatment: Est. = 8.21, $SE = 1.99$, $p < .001$, $d = 0.99$, 95% CI [0.19, 1.78], for the immediate NR group; Est. = 4.97, $SE = 2.50$, $p = .052$, $d = 1.10$, 95% CI [0.02, 2.17], for the delayed NR group. There were no differences in outcome regarding individuals who had received treatment in the past versus those who had not, CAPS total score: $B = 7.38$, $SE = 8.94$, $\beta = .16$, $p = .418$; BDI, $B = -1.05$, $SE = 2.86$, $p = .718$, $\beta = -.05$. Controlling for participant age, gender, and time since trauma did not affect the results of the analysis.

To facilitate a clinical interpretation of the results, we applied three additional levels of improvement regarding PTSD (Schnyder, Müller, Maercker, & Wittmann, 2011)): (a) treatment response, as measured by a CAPS total score decline of at least 22 points, or 1 standard deviation, relative to the mean pretreatment score; (b) loss of diagnosis, whereby an individual no longer meets symptom criteria and or reports a CAPS total score of at least 45; and (c) complete remission, as demonstrated by a CAPS total score of 20 or lower. At posttreatment, the immediate NR group included three patients who were in total remission, seven who were subclinical, and three who were classified as treatment responders. Of the three participants in this group who were nonresponders at the end of treatment, another two patients were subclinical at the 3-month follow-up assessment. In the delayed NR group, at posttreatment, four patients were in total remission, one was subclinical, one was a treatment responder, and three were nonresponders posttreatment.

Discussion

In this first pilot quasi-randomized controlled study of NR for PTSD, we found that NR was an effective treatment. At T2, at which point the immediate NR group had received treatment and the delayed NR group had not, the level of PTSD symptoms among participants in the immediate NR group had decreased significantly, whereas symptom levels in the delayed NR group remained stable. In addition, at T3—that is, after the delayed NR participants completed their NR treatment—PTSD symptom severity among participants in the delayed NR group was comparable to the T2 levels reported by the immediate NR group. For individuals in the immediate NR group, symptom levels remained low at T3. The present results show a large effect size regarding PTSD symptoms. The between-groups effect size, $d = 1.17$, was comparable to the average effect size for active versus control treatment comparisons, $d = 1.11$, as reported in a meta-analysis by Bradley et al. (2005). Regarding depressive symptoms, the between-groups effect size, $d = 0.52$, was medium, whereas the pre- versus posttreatment reduction was large, $d = 1.01$. It should be noted that the T1 between-group differences concerning depressive symptoms make the between-groups effect hard to interpret. Nevertheless, these results are encouraging considering the chronic nature of the participants' symptoms (i.e., the average time since the traumatic event was 9.7 years). Furthermore, nearly 60% of participants had previously been nonresponsive to psychotherapy.

The results of the study also suggest that NR was well-received by participants. The dropout rate (4.3%, $n = 1$) for NR was much lower than the 18% average dropout rate reported in a meta-analysis by Imel et al. (2013) and the even higher dropout rates that have been associated with evidence-supported PTSD treatments (Foa et al., 2005; Najavits, 2015; Resick et al., 2002). Dropout percentages can be misleading

Table 3
Estimated Marginal Means and Standard Errors of Fitted Models by Mixed Model Regression Analysis and Cohen's d values

	Immediate NR		Delayed NR		
Variable	*M*	*SD*	*M*	*SD*	Cohen's *d*
CAPS total					
T1	71.77_a	5.14	64.77	5.88	
T2	41.81_b**	5.36	61.63_a	6.04	
T3	35.76	5.92	38.75_b	6.61	
T1–T2 between-group effect size[a]					1.17
CAPS Intrusion					
T1	20.53	1.85	20.23	2.11	
T2	12.22_a*	1.91	17.27_a	2.16	
T3	10.24_b	2.05	8.35_b	2.30	
T1–T2 between-group effect size[a]					0.83
CAPS Avoidance					
T1	27.88_a	2.47	24.15	2.82	
T2	13.52_b**	2.61	24.16_a	2.92	
T3	12.31	2.98	16.15_b	3.30	
T1–T2 between-group effect size[a]					1.26
CAPS Hypervigilance					
T1	23.25_a	1.93	20.39	2.20	
T2	16.02_b	2.02	20.32_a	2.27	
T3	13.18	2.26	14.49_b	2.51	
T1–T2 between-group effect size[a]					0.65
BDI-R					
T1	25.29_a	2.67	17.46	3.05	
T2	17.38_b	2.75	21.20_a	3.11	
T3	16.79	2.93	16.20_a	3.29	
T1–T2 between-group effect size[a]					0.52

Note. Asterisks denote significant between-group differences. Within each group and measure, pre- and post–narrative reconstruction (NR) cells with different subscript letters denote significant change at the $p < .05$ level from pre- to post-NR. T1 = Time 1; T2 = Time 2; T3 Time 3; CAPS = Clinician-Administered PTSD Scale; BDI-R = Beck Depression Inventory-Revised

[a]The between-group effect size reported is the active versus control treatment comparison.

*$p < .05$.

**$p < .01$.

in small samples, and, therefore, may be a limitation of the conclusions we can draw from the present study. Furthermore, non-initiators were not included in our definition of dropout, as the most probable reason could have been their inability to tolerate the waiting period without treatment. Importantly, these low dropout rates and significant clinical gains were obtained in the context of therapy being delivered by psychology residents who had had only modest experience in the treatment of posttraumatic symptoms.

If the present findings are replicated, NR may emerge as a promising intervention, given the positive outcome and low dropout rates. The gradual nature of exposure, integrative approach, and lack of homework assignments may provide a less-taxing form of trauma-focused work and make NR easy to disseminate. Yet, the good outcomes reported concerning intensive exposure (Sherrill et al., 2020) indicate that further study of the effect of gradual exposure is needed. For cases of complex trauma exposure, in which there may be less access to detailed memories, NR would be contraindicated in its present form. However, if a patient with CPTSD has distinct and prominent memories, NR might be a possible intervention for processing those memories (Courtois, 2008). The results of the current study provide support for the notion that organizing a coherent narrative of the trauma memory, integrating the traumatic memory into autobiographical memory, and incorporating new, personal meaning to the trauma are therapeutic. This is in line with findings that have shown the efficacy of narrative interventions that rely on the writing and elaborating of the trauma memory, such as NET (Elbert, Schauer, & Neuner, 2015) and WET (Sloan et al., 2016).

An additional underlying mechanism of change in NR regarding neurobiological memory research may be the

reconsolidation of the trauma memory each time the memories are brought to mind (Lane, Ryan, Nadel, & Greenberg, 2015). The work done in NR may help patients gradually overcome their avoidance of painful parts of the experience, particularly those parts that are loaded with fear, shame, and guilt, and may help override the original memory (Nader, Schafe, & Le Doux, 2000), or may help create an alternative competing memory (Craske et al., 2008). These hypotheses would require further research. As NR includes several different ingredients, the efficacy of specific NR elements should be dismantled and examined. These elements include the writing of the trauma narrative during sessions, assigning versus not assigning homework, the active integration of the trauma memory into the patient's life story, and the elaboration of personal meaning.

It is interesting to note that we did not find a significant improvement in the Group × Time interaction for the Hypervigilance subscale. This is in line with research (Schnurr & Lunney, 2015) that demonstrated that PE was less effective for hypervigilance symptoms as compared to other symptoms, and it is compatible with the findings of an older review of the outcomes of CBT interventions in PTSD patients in which the authors found that insomnia and other hypervigilance symptoms, such as irritability and exaggerated startle, were less affected compared to other symptoms (Zayfert & DeViva, 2004). Although our results demonstrated associations in the expected direction, as seen in Figure 2, they may indicate that individuals with chronic PTSD may require additional intervention that focuses on hypervigilance symptoms, such as relaxation or biofeedback training.

When considering the findings of the current study, several limitations should be noted. To examine the initial efficacy of NR, we used a waitlist as a control group, which is consistent with Schnurr's (2007) suggestion. Comparing NR to other active treatments would be an important next step. In addition, demographic characteristics regarding educational attainment, race, ethnicity, and cultural and religious background were not collected, thus possibly limiting the generalization of the findings. Although the heterogeneous nature of the participants' traumatic events may point to the generalizability of the findings and to the possible application of NR across a broad PTSD population, it would be important, due to the present study's small sample size, to test the efficacy of NR within larger samples and more specific trauma groups. In addition, the CAPS-5 (Weathers et al., 2013) was not yet published when the present data collection began; nevertheless, the use of an older version is a present limitation. Finally, the current study only included individuals with chronic PTSD, which precludes generalization to other traumatic reactions and complex trauma exposure, both of which are important directions for future research.

In summary, our findings suggest that NR may be a short-term, well-tolerated, and effective treatment for PTSD. Practitioners can be trained in the model relatively easily, enabling broad dissemination. Although the present study was conducted with a small sample in a community setting, there is clear support for additional outcome and process research to further establish treatment efficacy.

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