

Flash Technique in a Scalable Low-Intensity Group Intervention for COVID-19-Related Stress in Healthcare Providers

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The flash technique (FT) is a low-intensity individual or group intervention that appears to rapidly lessen the distress of disturbing and traumatic memories. This paper reports on the safety and effectiveness of group FT with 77 healthcare providers and 98 psychotherapists impacted by working with COVID-19 patients. One-hour webinars included 30 minutes of psychoeducation and two guided 15-minute FT interventions, focused on participants' most distressing pandemic-related memory. Before and after each 15-minute FT intervention, they rated that memory using the 11-point 0-to-10 subjective units of disturbance (SUD) scale. Results from both interventions were highly significant with large effect sizes ($p < .001$, Hedges' $g = 2.01$, Hedges' $g = 2.39$). No adverse reactions were reported. For 35 participants who processed the same memory in both interventions, the pre-post SUD scores from the beginning of intervention #1 to the end of intervention #2 showed a significant reduction with a large effect size ($p < .001$, Hedges' $g = 3.80$). For this group, both intervention #1 and intervention #2 showed significant reductions with large effect sizes ($p < .001$, Hedges' $g = 2.00$) ($p < .001$, Hedges' $g = 1.18$). Follow-up SUD scores were obtained from 58 participants, with the mean disturbance level showing a significant further decrease. These findings provide preliminary evidence that group FT appears to safely provide rapid relief from disturbing memories. FT merits further research.

Keywords: COVID-19; flash technique (FT); eye movement desensitization and reprocessing (EMDR) therapy; online; healthcare providers; low intensity

The COVID-19 pandemic has engendered psychological distress for many healthcare providers (Greenberg et al., 2020; Que et al., 2020; Spoorthy et al., 2020). Health workers and public service providers who had contact with COVID-19

patients were significantly more likely to suffer from posttraumatic stress disorder (PTSD) symptoms and depression, and those having direct contact with patients had significantly higher levels of these symptoms than those who did not (Johnson et al., 2020).

Treatment of PTSD and Psychological Trauma With High- and Low-Intensity Interventions

High-Intensity Interventions

High-intensity psychotherapeutic interventions, those that utilize more resources, are typically characterized by one-to-one therapy with a mental health professional over extended periods of time, and can yield profound and durable benefit. A recent meta-analysis by Mavranouzouli et al. (2020) found that even eye movement desensitization and reprocessing (EMDR) therapy, which was determined to be the most cost-effective treatment for adult PTSD, requires an average of 9 hours of therapist interaction at a cost of £912 (US\$ 1,267) per patient, making high-intensity interventions unavailable to many people who need them.

Also common to these high-intensity therapies for PTSD is “exposure”—the need for clients to consciously focus on traumatic memories, often for prolonged periods of time. In exposure-based treatments, clients who are highly defended, dissociative, or avoidant of emotional pain will sometimes avoid or refuse treatment, dissociate, drop out of treatment prematurely, or become more symptomatic due to excessive activation of their trauma memories (Kehle-Forbes et al., 2016; Zayfert et al., 2005). Although EMDR treatment requires only brief exposure to the memory, exposure is essential, and activation of the traumatic memory network is required (Shapiro, 2018).

Some therapists use low-intensity interventions, such as meditation or affect regulation training, to prepare their clients for the more challenging high-intensity interventions. In EMDR therapy, various forms of resourcing are commonly used during the preparation phase to give clients more access to adaptive adult perspectives.

Low-Intensity Interventions

With limited resources available for treatment and high numbers of people suffering, there is an increasing need for effective psychological interventions that are “low-intensity,” able to effectively impact substantial numbers of people, while utilizing a minimum of psychotherapist time and involvement. Interventions that could fill these needs include those that can be provided by paraprofessionals, can be provided electronically without ongoing therapist involvement, are effective in a brief amount of time, or can be administered to multiple patients simultaneously. Low-intensity interventions include abbreviated versions of

efficacious high-intensity treatments with the potential of delivering therapeutic effects more efficiently.

Computer-Delivered Interventions. Computer-delivered interventions for PTSD prior to 2020 have been almost entirely based on trauma-focused cognitive behavioral therapy (CBT) and although studies show large effects, the quality is very poor (Lewis et al., 2020). Recently, the use of a computer activity similar to playing the game Tetris (Kanstrup, Kontio et al., 2021; Kanstrup, Singh et al., 2021) reduced the frequency of intrusive memories subsequent to a trauma-related hospital emergency room visit. This appears to be a promising method of disrupting the formation of PTSD flashbacks and merits further research. A computerized version of the flash technique (FT) with some similar features has also shown promising preliminary results in reducing subjective distress associated with disturbing memories (Manfield & Engel, 2019), and is currently the focus of a randomized controlled trial (RCT) in progress at York University (Dang et al., 2021).

The Flash Technique

The FT (Manfield et al., 2017) is a recently developed low-intensity method of relieving distress from traumatic memories that appears to have the benefits of both low-intensity and high-intensity interventions. Like many low-intensity interventions, FT is simple, quick, appears to be well-tolerated, and can be done in individual or group settings. FT can be highly efficient in the use of resources; a recent study included FT groups as large as 500 in one setting with no adverse outcomes or degradation of effect (Manfield et al., 2020). Although future research is needed, preliminary results suggest that FT may reduce or eliminate the distress associated with recalling an upsetting or traumatic memory, and the possibility that these effects may be maintained. FT can also prepare a client for subsequent high-intensity work.

History

The FT began as a strategy for titrating the disturbance of extremely disturbing memories for treatment with EMDR. The originator of FT, the first author, had been trained in the use of EMDR in 1991 by Francine Shapiro, PhD (Shapiro, 2018), to resolve PTSD. Like many of his colleagues, he found EMDR to be extremely powerful and experimented with applying it to increasingly complex cases.

Complex PTSD and extreme dissociation are among the kinds of complex conditions to which EMDR was applied. The difficulty with these applications is that an essential element of EMDR requires that clients must, at least briefly, access the disturbance associated with the incident they are attempting to resolve with EMDR. There is a risk that some clients with complex PTSD will dissociate or flood with emotion when accessing that disturbance, making balanced EMDR processing difficult (Shapiro, 2018).

One common solution to this troublesome issue is to initially titrate the intensity of an extremely disturbing memory by suggesting a modified version of the memory that would be less overwhelming to the client. After the modified memory was successfully treated with EMDR, the original would be likely to be less disturbing, and then that too could be processed with EMDR. Of the many effective strategies for titrating memories, one developed by Krystyna Kinowski (2003) was based on an application to EMDR of Levine and Frederick's (1997) "pendulation" technique. Kinowski helped clients to think of a very positive image, and then guided them to alternate between thinking of the positive image and thinking very

peripherally of the disturbing memory they wanted to resolve.

After using this technique for many years to apply EMDR to complex cases, the first author began to experiment with increasingly brief and peripheral client exposures to the disturbing memory. He found that the reduction in disturbance achieved became more pronounced and rapid as the client's exposure to the disturbance reduced. Eventually, he suggested FT as an extreme titration technique in which almost all conscious contact with the disturbing memory is avoided by instructing the client to think of a positive distraction, engage in alternating bilateral stimulation, and periodically blink rapidly three to five times (Manfield et al., 2017). He found that the initial reduction in disturbance achieved by this technique facilitated the use of EMDR with volatile and fragile clients and with extremely disturbing target memories.

In the original paper, Manfield et al. (2017) introduced FT as a way to reduce the distress level of a memory in preparation for standard EMDR. In that formulation, clients were instructed to think of the memory momentarily—so briefly that the client would not access any images from the memory or feel

TABLE 1. The Current (March 2021) FT Protocol as Used in EMDR Therapy

| Summary of the Flash Technique | |
|--------------------------------|--|
| Choose a disturbing memory | It is recommended that FT be initiated at the end of phase 2 (preparation) of the EMDR protocol. The therapist guides the client to identify or select a disturbing memory or image to address, which is referred to as the "target." The clients are asked to rate the SUD level that the target memory or image would generate if they were to let themselves feel the disturbance, but they are not encouraged to feel the disturbance. Clients are encouraged to "touch on" their disturbing memories without thinking of details or recalling them vividly. |
| Positive engaging focus (PEF) | Clients are asked to focus on imagining an activity, animal, person, memory, or music selection that provides an immediate experience of pleasure and/or is positive and engaging. Examples are provided. If needed, clients are encouraged to listen to a music selection or look at engaging images. |
| Distraction component | Clients are directed to alternately tap one thigh and then the other: "I am going to tap my thighs, and I would like you to copy my movements, tapping your thighs while focusing on the positive engaging activity, memory, or person you have just thought of. Thinking of this will give you an alternative positive focus as a substitute for the disturbing memory. It may be helpful for you to tell me about what you like about it." |
| Flash | While tapping their thighs and focusing on the PEF, clients are periodically prompted by the word "flash" to blink rapidly three to five times. "When I say 'flash,' blink your eyes rapidly three, four, or five times, while maintaining your attention on the PEF." |

(continued)

TABLE 1. The Current (March 2021) FT Protocol as Used in EMDR Therapy (Continued)

| | Summary of the Flash Technique |
|-------------------------------|--|
| Check-in | After six such prompts, participants are asked to stop tapping and blinking, and, without thinking of the target memory directly, “check in lightly” to notice any change that may have occurred in it. No measurement is suggested unless the client’s disturbance appears to have become minimal. The sequence—including tapping, six sets of triple blinks, and checking in for a change in the target memory—is repeated as needed as long as FT is efficiently reducing the SUD level. No measurement of disturbance level is done until the level seems to be substantially reduced. If FT was initiated during phase 2 (preparation) of the EMDR protocol, as is recommended, and disturbance is no longer reducing as a result of FT, proceed to Phases 3 through 8. |
| Instructions during check-ins | During a check-in, clients who are having difficulty describing the change they are experiencing are sometimes told that, for many people, change takes the form of the memory seeming further away. If no change is reported by the second check-in, therapists must consider whether the positive engaging focus (PEF) might be too weak or not sufficiently engaging. If so, it should be strengthened or changed. If the disturbance appears to be gone, the therapist should explore the possibility that one or more disturbing aspects of the target may have been overlooked and remain disturbing. |
| Feeder memories | As is standard in EMDR therapy, if there is an earlier disturbing memory that is being activated by the thought of the target memory, and is causing the target memory to be more disturbing than it would otherwise be, the earlier one should be targeted first. |
| Within standard EMDR | If FT was initiated during the preparation phase (phase 2) of the 8-phase EMDR protocol, phase 3 is initiated after completing the use of FT. |

Note. FT = flash technique.

any of the associated emotion. Analogies were used to convey the brevity of the connection to the disturbing memory, such as passing one’s finger rapidly through a flame or blinking one’s eyes.

Since then, FT has evolved. Currently, after initially identifying a memory to be the “target” of EMDR, clients are discouraged from intentionally bringing the memory to mind at all. In this way FT is intended to be minimally upsetting to clients. They are asked to concentrate on a positive, engaging image or memory so they are not consciously aware of disturbance associated with the target memory. A detailed description of the FT protocol is found in Table 1.

Previous Research With the Flash Technique

In addition to the original report of four case examples (Manfield et al., 2017), there are a few small case studies published about FT to date. Two are single case papers (Konuk, 2019; Shebini, 2019) and one (Wong, 2019) involved five residents of a homeless shelter who were extremely dissociative and were treated as

a group. Measures for the group members pre- and post-FT showed significant improvement, and, after completing treatment, two participants were actively looking for jobs.

Manfield et al. (2020) reported the results of data collected from four studies on three continents. The participants were 631 therapists who were enrolled in an FT webinar and three in-person workshops to learn to use FT with their own clients. During the webinar, participants worked on two personal memories. Results showed significant reductions in subjective units of disturbance (SUD) scores with a large effect size posttreatment and persisting at 1-month follow-up: ($M = 7.19, SD = 1.276$) ($M = 1.87, SD = 1.680$) ($M = 1.45, SD = 1.708$) $F(1.762, 378.782) = 1189.835, p < .001, \eta^2 = .846$ Hedges’ $g = 3.27$. While the results were encouraging, that study had the important limitations of having no comparison group, and that participants were therapists seeking training in FT—not treatment-seeking clients. In the present study, participants were medical and mental health providers seeking relief from distressing memories related to treating COVID-19 patients.

Method

The present study reports on a series of webinars initiated at the request of a statewide healthcare providers' union concerned about the impact of COVID-19 on its 40,000 members. The union approached the first and second authors (PM; LE), requesting that they develop a scalable low-intensity group intervention based on FT. The study was approved by the Institutional Review Board of Northampton, Massachusetts, Trauma Institute (approval # 1002-2020).

Participants

One hundred seventy-five volunteers participated in these webinars, including 98 mental health therapists and 77 nontherapist healthcare providers, 55 of whom reported being impacted professionally by COVID-19. Ninety-two percent of participants were women. No other demographic information was collected. Participants completed a registration form, and indicated their willingness to participate in the study and to have their data collected as a condition for participation by checking a box on the form.

Participants were initially recruited through the communication channels of the healthcare providers' union, resulting in only 11 registrations, all healthcare providers. Recruitment was also done through targeted Internet advertisements (Google AdWords, LinkedIn, and Facebook), resulting in 21 responses. Notices on Internet listservs and word of mouth from previous participants brought in the remaining registrations.

Inclusion/Exclusion Criteria

There was no contact between participants and researchers before the webinar. There was no assessment of participants. The only inclusion criterion was completion of the registration form, although the form stated that the webinar was intended for healthcare professionals.

There were no exclusion criteria. None of the attendees were excluded from participating in the research. Attendees were told that the technique was designed to provide some relief from their disturbing memories, especially those related to COVID-19, with minimal experience of distress during the process. They were told that a psychotherapist would be available at the end of the webinar if they thought they needed immediate professional help. Participants who believed they were not psychologically stable or had poor affect-modulation skills were discouraged from participating in the FT intervention. It is likely that

all, or nearly all, participants engaged in the FT intervention; however, engagement was not tracked. Previous webinar participants were permitted to retake the webinar, but their data were excluded.

Design

The study used a case series design, in which participants rated their subjective memory-related distress prior to each of two brief FT experiences and again just after those experiences. Participants were also asked to rate their memory-related distress at least a week after their webinar experience (follow-up periods varied). No control group was included.

Measure: Subjective Units of Disturbance Scale. The SUD scale (Wolpe, 1958, as adapted by Shapiro, 2018) is a simple self-report measure for evaluating the intensity of subjective distress when recalling a traumatic memory. The 11-point scale ranges from 0, which is defined as "not disturbing at all," to 10, which is "the worst you can imagine." This self-report scale is widely used for evaluating the severity of a traumatic memory and has been shown to correlate with other psychological and autonomic measures of distress (Kim et al., 2008; Marx et al., 2012; Pineles et al., 2013; Tanner, 2012; Thyer et al., 1984).

Intervention. Eight free 1-hour webinars were conducted by the first and second authors (PM; LE) between April 2020 and November 2020. The number of participants in each webinar was not limited; group size varied from five to 40. The webinar leaders did not interact with participants until the end of the first intervention, so it is possible that an equivalent result could have been achieved from a prerecorded video presentation.

Specific Application of Flash Technique in Current Study

The webinar began with 30 minutes of psychoeducation and rationale for FT. This was followed by two 15-minute FT sessions. The FT interventions followed as closely as possible the procedures in Table 1 for individual use of FT. There was no interaction between participants, or between participants and presenters, until the end, when several questions could be posed and addressed, time permitting.

Briefly, the webinar instructions were:

1. Identify a trauma memory.
2. Concentrate on a positive engaging focus (PEF), activity, or memory, while also focusing on

adual-attention stimulus such as participants alternately slapping their own thighs slowly.

3. Blink rapidly multiple times every 5 or 6 seconds at the leader's prompt of "Flash!" while continuing to focus on the engaging focus and not intentionally thinking of the disturbing memory.
4. Periodically, when instructed to, check for change in the disturbing memory without thinking of the details of it.
5. At each of the second through fifth check-in there was an additional comment. At the second check-in, participants were told if they had not noticed any change at that point, there was probably a problem with the PEF—that it was not sufficiently engaging. In that case they should try to strengthen the PEF or choose a different one. At the third check-in, participants were told to notice if there might be some disturbing aspect of the memory that they may have overlooked. At the fourth check-in, participants were told to notice if there might be an earlier disturbing memory that was related to the one they started with and may have been contributing to the disturbance level of the more recent memory. After the fifth check-in, the participant was asked to again evaluate the level of SUD currently associated with the target memory and to enter that information into an on-screen poll, where it is displayed in aggregate and recorded for the purposes of research.

In the FT intervention, participants were encouraged to select their worst COVID-related memory. If not COVID-related, they were encouraged to focus on an event that was not within the past 2 years. This restriction arose from our experience with recent events that are not highly charged. We have noticed that they can require direct therapist intervention to help find an earlier related incident, if it exists, so we asked that participants in our webinars select highly charged recent memories or older memories. The data was collected pre and post for each FT intervention in the following manner: Before the procedure, participants were asked to rate the SUD level that the target memory or image would generate if they were to let themselves feel the disturbance. They indicated that rating in an on-screen poll, and their responses were electronically recorded.

After the procedure, participants were asked to determine the current SUD level of their target memory and indicate it in a second on-screen poll, which recorded their information and displayed the group data as an aggregate.

Results

The participants (77 healthcare providers, 98 psychotherapists) worked on 175 memories in the first intervention. In the second intervention, 35 did additional processing of their first memory, 29 did not report participating, and the remaining 111 processed new memories. In total, 286 memories were processed in this study.

Pre–Post Analysis of First Flash Technique Intervention

Pre-post scores for the first intervention were provided by all 175 participants. A general linear model (GLM) repeated measures analysis found a significant reduction in SUD levels with a large effect size for the entire group from before to after treatment: ($M = 7.34, SD = 1.507$) ($M = 3.19, SD = 1.937$) $F(1, 174) = 864,597, p < .001, \eta^2 = .832$ Hedges' $g = 2.39$. All participants reported a reduction in SUD score of at least one point with the exception of five participants, who reported no change. No participants reported an increase. A one-way analysis of variance (ANOVA) was performed to see if there was a difference in the pre- to post-FT disturbance reduction reported by psychotherapists and healthcare providers in intervention #1 and again in intervention #2. No relationship was found, suggesting that the responses of the two groups to the interventions were not significantly different. Since the outcomes were the same for these two groups, the statistical results from these two groups were combined in our analysis rather than considered separately.

Distribution of the SUD Scores. Notably, 45% of the participants (79 out of 175) reported a SUD level of 0, 1, or 2 at the end of the 15-minute intervention. SUD ratings of 2 or less indicate that a disturbing memory is minimally disturbing or not disturbing at all (see Figure 1).

Results of Second Intervention

Of the 175 participants who participated in the first intervention, 35 chose to focus on the same memory in the second intervention as they had in the first one. One hundred eleven chose to focus on a different memory in the second intervention. No data are available for the remaining 29 who either did not participate or did not turn in their post-treatment results from the second intervention (see Figure 2).

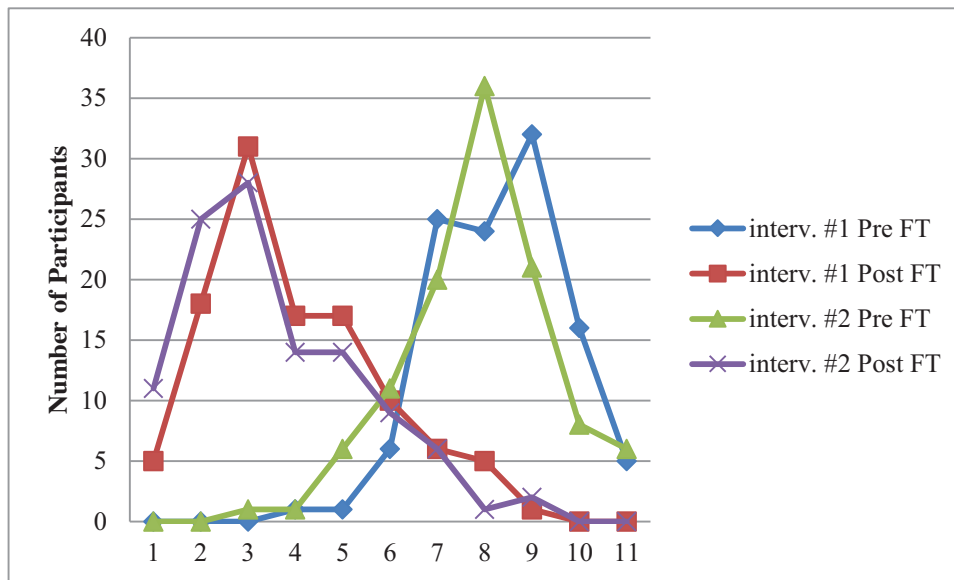


Figure 1. Distribution of subjective units of disturbance (SUD) scores comparing intervention #1 & #2 (N = 111).

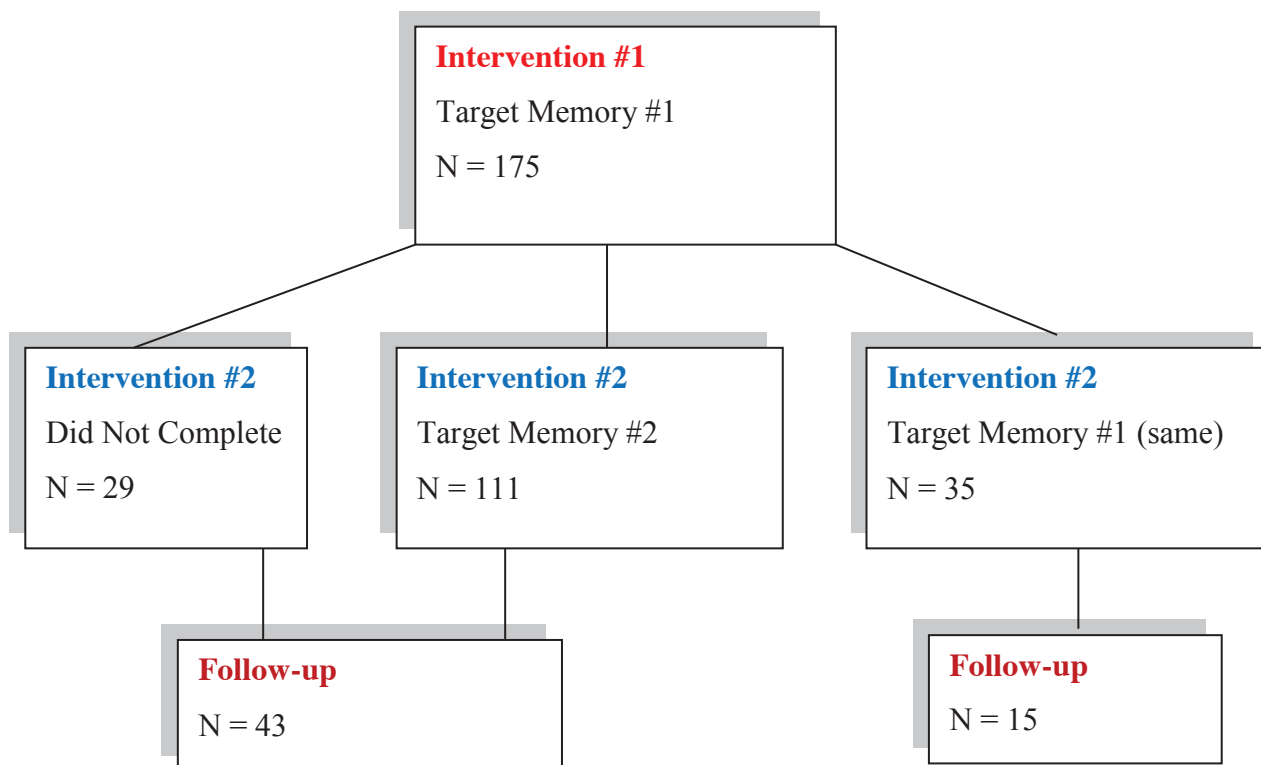


Figure 2. Participant flow chart (N = 175).

The results for the second intervention from 111 participants who chose to use a different memory for the first and second interventions were calculated. They showed a 62% reduction in SUD with a large effect size: ($M = 6.86$, $SD = 1.552$) ($M = 2.59$, $SD = 1.865$) $F(1, 110) = 510.796$, $p < .001$, $\eta^2 = .823$ Hedges'

$g = 2.49$ (see Figure 1). Results from this same subset of participants for the first intervention were similar, revealing a 59% reduction in SUD: ($M = 7.21$, $SD = 1.413$) ($M = 2.93$, $SD = 1.880$) $F(1, 139) = 750.000$, $p < .001$, $\eta^2 = .844$, Hedges' $g = 2.90$. Because of a concern that displaying the aggregate results of the first

intervention before conducting the second intervention might have influenced the results from the second intervention, a GLM comparing the reductions in disturbance resulting from the two interventions was performed for the 110 participants who chose a new target memory for the second intervention. It did not reveal a significant difference, suggesting that any influence on the second intervention caused by displaying the results of the first intervention was not found: ($M = 4.35, SD = 1.827$) ($M = 4.14, SD = 1.944$) $F(1, 110) = 1.015, p = .316, \eta^2 = .009$ (see Figure 1).

Follow-Up

Fifty-six participants provided follow-up on the first intervention. Forty-four gave follow-up on the second. This lower number may be because they did not participate in the second intervention, or did not remember what memory they had focused on in their second intervention. See Table 2.

Sixty-six participants out of 175 provided follow-up, eight of whom could not remember either of the disturbing memories they had processed. The follow-up comment of one of these eight might be representative of others. She wrote, "It must have worked if I don't remember what my memory was." If this is true, follow-up mean scores may underrate the actual reductions in mean SUD levels.

Fifty-six participants provided follow-up information for intervention #1 and 44 provided follow-up information for intervention #2, with 42 providing information for both. To assess whether the 56 providing intervention #1 data were representative of the group of 109 who had not, the change in the SUD score of participants pre- to post-FT for the two groups was compared using a one-way ANOVA. The null hypothesis for this comparison was that the two

factors interacted with each other. No significant interaction was found between the two groups in pre- to post-FT SUD changes: ($M = 3.95, SD = 1.871$) ($M = 4.49, SD = 1.812$), $F(1, 173) = 3.571, p = .06, \eta^2 = .016$. In addition, no significant interaction was found in pre- to post- SUD change between participants who followed up from intervention #2 and those who did not: ($M = 3.87, SD = 2.012$) ($M = 3.70, SD = 1.999$), $F(1, 144) = .248, p = .619, \eta^2 = .002$. These results support the representativeness of the data obtained from the follow-up.

Main Effect for Both Interventions for Participants With Follow-Up Scores

Follow-up scores were provided by 58 participants at 1 week or more after the intervention. A GLM repeated measures ANOVA performed to test the main treatment result's significance and effect size showed a significant reduction in mean SUD levels in both interventions from pre- to post-intervention. There was a large effect size for pre-post SUD change in intervention #1: ($M = 7.41, SD = 1.660$), ($M = 2.91, SD = 1.761$), $F(1.723, 94.792) = 196.800, p < .001, \eta^2 = .894$ Hedges' $g = 2.63$. The pre-post scores for intervention #2 included 35 participants who continued with the same target used in the first intervention: ($M = 6.05, SD = 2.372$), ($M = 2.82, SD = 2.116$), $F(1.707, 73.383) = 80.602, p < .001, \eta^2 = .652$ Hedges' $g = 1.44$ (see Figure 1). A further significant decrease in mean SUD levels was observed in both interventions from immediately post-FT to follow-up: ($M = 2.91, SD = 1.761$) ($M = 2.07, SD = 1.898$) $F(1, 55) = 7.584, p = .008, \eta^2 = .121$ Hedges' $g = .46$. ($M = 2.82, SD = 1.841$) ($M = 1.84, SD = 1.714$) $F(1, 43) = 12.507, p = .001, \eta^2 = .225$ Hedges' $g = .55$. Although the effect sizes

TABLE 2. SUD Score Means (SD) at Pre, Post, and Follow-Up for 58 Participants With Follow-Up

| | First FT Intervention | | | Second FT Intervention | | |
|-------------------------|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | Pre | Post | Follow-up | Pre | Post | Follow-up |
| Healthcare providers | $N = 23$ SUD = 8.13 $SD = 1.687$ | 23 3.48 $SD = 1.780$ | 23 2.33 $SD = 2.054$ | 18 5.5 $SD = 2.595$ | 18 2.5 $SD = 2.036$ | 18 1.75 $SD = 1.784$ |
| Mental health providers | $N = 33$ SUD = 6.91 $SD = 1.466$ | 33 2.52 $SD = 1.661$ | 33 1.89 $SD = 1.793$ | 26 6.42 $SD = 2.176$ | 26 3.04 $SD = 2.181$ | 26 1.90 $SD = 1.697$ |
| All providers | $N = 56$ SUD = 7.41 $SD = 1.660$ | 56 2.91 $SD = 1.761$ | 56 2.07 $SD = 1.898$ | 44 6.05 $SD = 2.372$ | 44 2.82 $SD = 2.116$ | 44 1.84 $SD = 1.714$ |
| Total | 56 | 56 | 56 | 44 | 44 | 44 |

were small and moderate, these significant additional decreases indicate that, not only did the reduction in disturbance hold, but the disturbance level decreased over time. They suggest that the processing effect of the interventions continued beyond attendance in the webinar.

Performance of Various Subgroups of Participants

Variations in Recruitment Modality. Nineteen of the 77 nontherapist participants were recruited through targeted Internet advertisements. These were the “purest” participants in the sample as they were not responding to a recommendation or endorsement from someone familiar to them who might have influenced their results in the study. A one-way ANOVA revealed no significant difference in mean pre- to post-FT disturbance reduction in intervention #1 between those participants recruited through targeted advertising: ($M = 3.95, SD = 1.649$) and those recruited in other ways: ($M = 4.47, SD = 1.921$) $F(1, 76) = 1.111, p = .295, \eta^2 = .015$. Results for intervention #2 showed a significant relationship, with those recruited through advertisements showing a significantly lower reduction in SUD levels ($M = 2.79, SD = 1.626$) than those recruited in other ways ($M = 4.34, SD = 1.914$) $F(1, 109) = 8.345, p = .005, \eta^2 = .071$.

Participants Reporting High Distress. Twelve participants chose memories for the FT intervention #1 that they rated 10 (the most disturbing), and 28 others chose memories that they rated as 9 (nearly the

most disturbing.) To further evaluate FT’s safety and effectiveness for participants with extremely high disturbance levels, a separate GLM repeated measures ANOVA was performed on the data from these 40 participants. The mean reduction in SUD scores pre- to post- FT was 51% and highly significant: ($M = 9.30, SD = .464$) ($M = 4.60, SD = 1.985$) $F(1, 39) = 241.997, p < .001, \eta^2 = .861$ Hedges’ $g = 3.26$. The effect size was large. Of these participants, all experienced a reduction in disturbance of at least two points.

Participants Who Focused on the Same Highly Disturbing Memory in Both Interventions. Of the 40 people who focused on extremely disturbing memories (SUD of 9 or 10), it was expected that some would choose to address the same memory in the second intervention, producing a further reduction in disturbance. Fifteen out of 40 did so. As would be expected, the mean reduction in SUD scores for these participants, from beginning the first intervention to completing the second, was higher (72%) than from the first intervention alone. Additionally, the SUD reduction was highly significant with a large effect size: ($M = 9.47, SD = .516$) ($M = 5.00, SD = 1.852$) ($M = 2.67, SD = 1.839$) $F(1.949, 27.283) = 118.019, p < .001, \eta^2 = .952$ Hedges’ $g = 5.03$.

All Participants Who Focused on the Same Memory in Both Interventions. Of the entire group of 175 participants, 20 participants who began with less disturbing memories also chose to focus in the second intervention on the same memory, for a total of 35. An analysis of the scores of all 35 showed that they obtained

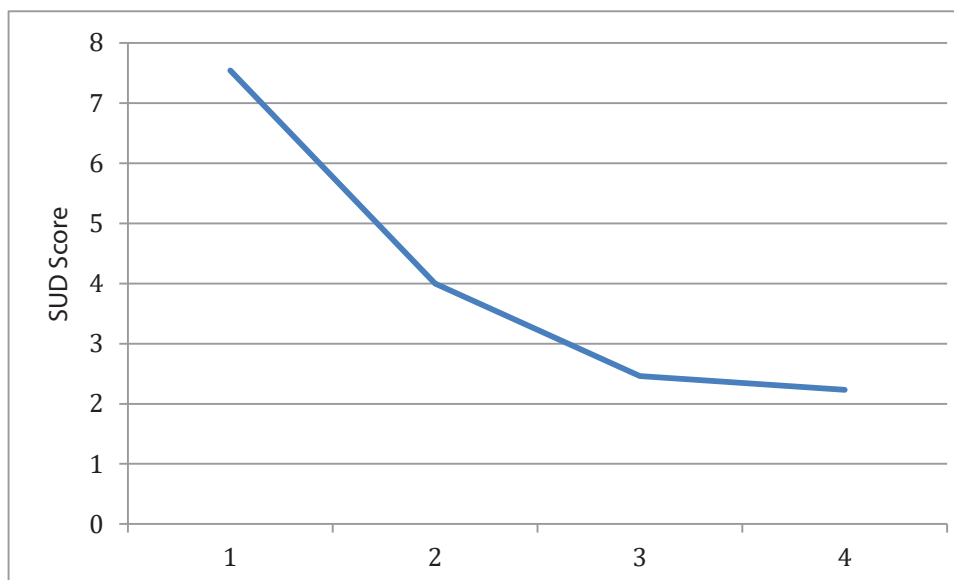


Figure 3. SUD scores at four measurements for 15 participants using the same memory for both interventions and providing follow-up.

Note. 1 = Initial SUD; 2 = Post 1st FT; 3 = Post 2nd FT; 4 = Follow-Up SUD

a significantly greater reduction of disturbance with a large effect size as a result of the second intervention: ($M = 7.83, SD = 1.774$) ($M = 4.23, SD = 1.832$) ($M = 2.43, SD = 1.737$) $F(1.853, 63.010) = 138.264, p < .001, \eta^2 = .866$ Hedges' $g = 3.08$. Of these, 15 also provided follow-up data. ($M = 7.67, SD = 2.024$) ($M = 3.47, SD = 1.922$) ($M = 2.33, SD = 2.093$) ($M = 2.20, SD = 2.086$) $F(2.043, 28.599) = 40.962, p < .001, \eta^2 = .745$ Hedges' $g = 2.54$ (see Figure 3).

No Adverse Outcomes

Although participants were informed that a therapist would be available after the webinar to assist anyone who was having difficulty, none of the 175 participants availed themselves of this resource. In the first flash intervention, no participant reported an increase in the SUD rating; in the second intervention, one participant reported a 1-point increase. The lack of adverse outcomes reflects positively on the apparent safety of FT.

Discussion

In the present study, 175 professionals experienced FT twice in a scalable webinar setting. Significant reductions in disturbance were reported at post-treatment and follow-up with no adverse outcomes reported. Those participants who used the same memory in both interventions achieved a further significant reduction in mean disturbance levels in the second intervention.

Analysis of participants reporting the highest initial memory-related distress indicates the apparent effectiveness of FT with severely disturbing memories, consistent with other case reports (Konuk, 2019; Manfield et al., 2017; Shebini, 2019; Wong, 2019) as well as the prior study done with therapists in FT training webinars (Manfield et al., 2020). Because the intervention was applied in groups for set time periods rather than individualized, the present findings may underestimate FT's possible benefit when done with an individual client. Finally, the analysis of outcomes of those participants who focused on the same target in the second intervention indicates the potential value of continuing with FT as long as a given client is making continued progress, rather than (as we did in these groups) stopping at an arbitrary point.

Safety of Flash Technique

The observed safety of FT is indicated by the absence of reported adverse outcomes by any of the

participants in this study. No participant reported an increase in the SUD level pre- to post-FT in the first intervention and one reported an increase of 1 point in the second. Ninety-seven percent reported reductions. These reductions are consistent with published cases in which FT was safely used with clinical populations (Konuk, 2019; Manfield et al., 2017; Shebini, 2019; Wong, 2019) as well as with therapists in FT webinars (Manfield et al., 2020).

Proposed Mechanism of Action

A series of seven papers by Paul Siegel and associates between 2009 and 2020 describes a phenomenon that also seems to explain the mechanism of action of FT. Siegel and Weinberger (2009) used exposure therapy to reduce symptoms of spider phobia (arachnophobia), using repeated exposure to an image of a tarantula on a video screen. They compared the responses of one group that saw and recognized the spider to a second group that did not know they had seen it because it was flashed too rapidly on the screen to be recognized. Siegel et al. (2011) referred to those exposures as "unreportable." Both groups received the benefit of this repeated exposure experience and became less severely phobic. The group that had the unreportable exposure received a significantly greater benefit. The improvements continued to be evident when measured a year later. Functional magnetic resonance imaging (*fMRI*) studies suggested that the probable explanation for this difference is that the conscious recognition of the spider image caused the subject's amygdala to become active and both the ventromedial and dorsolateral portions of the prefrontal cortex to become relatively inactive (Siegel et al., 2020, 2017). The role of these two parts of the prefrontal cortex is to stabilize emotions and evaluate fear responses. When these structures are less active, the desensitization effect of the exposure is reduced.

The opposite was true of the group that received unreportable exposures; the amygdala remained inactive while these two parts of the prefrontal cortex became extremely active, resulting in a more effective processing of the phobia. Siegel et al. speculated that a similar mechanism would be involved with emotions other than fear. We believe that FT accomplishes a similar result by distracting participants from consciously thinking about their disturbance, thus keeping the amygdala from becoming active and allowing the prefrontal cortex to be more effective. The blinking and check-ins, however, keep the target memory in focus, although the details and disturbance remain outside of conscious awareness. A more elaborate explanation of the role of the blinking will

appear in the August issue of the *Journal of EMDR Practice and Research* in an article by Sik-Lam Wong (2021).

Limitations and Strengths

Limitations of this study include the lack of a control group, the relatively short follow-up interval, and the low follow-up response rate in this study. Several factors may have accounted for this, but we suspect that the primary one was the lack of relationship between the participants and the study team. The participants were presumably interested in relief from trauma stress rather than in participating in research. Some of the follow-up requests were made several months after the webinar in which participants took part, which may have further reduced response rate. Eight out of the 66 responders, however, responded to indicate that they could not remember what they had focused on with FT.

An additional limitation in this study is that it only tracked participants' memory-related distress, and did not assess whether that translated to broader symptom relief. Such symptom relief has been found in several FT published case studies (Konuk, 2019; Manfield et al., 2017; Shebini, 2019; Wong, 2019). Further study is needed to confirm that FT not only reduces memory-related distress, but also related symptoms.

Finally, several sources of expectancy could have influenced the results reported by participants. The results of the first intervention were displayed to participants as an aggregate before the second intervention, raising the question of whether seeing so many people having success with FT would result in a distortion in the way the second set of results were reported. Analysis comparing the reductions of disturbance reported in the two interventions, however, did not reveal a significant difference.

At all the check-ins we asked participants whether they noticed "any change" in the memory, which would suggest that change was likely. At various check-ins, participants were asked to see if an insufficiently engaging PEF might be contributing to any lack of change; check to see if there might be a disturbing aspect of the memory that was being overlooked; and check to see if there might be an earlier memory that might be contributing to the disturbance associated with the memory being processed. Although the expectancy effects of these comments would likely be minor compared to showing participants evidence of obvious positive changes produced by FT in the

initial intervention—which did not result in any apparent change in results—the degree to which these factors influenced the outcome is nevertheless unknown. A delayed treatment control would not shed light on this question. A second RCT, currently in progress at York University, with a sham control that closely mimics the protocol being studied, will help to resolve this question (Babaei et al., 2021)

Strengths of the study include the use of a good-sized sample of help-seeking participants. Additional strengths include the use of a valid and reliable outcome measure; the use of a scripted, replicable intervention; the highly significant outcome results; and the large effect sizes. This study's follow-up findings support the stability of the reduction in disturbance, indicating a lasting effect as opposed to a temporary relaxation or distraction response. Furthermore, the additional reduction in disturbance reported at follow-up supports the conclusion that the FT intervention achieved substantial change.

Conclusions

This study found FT to be safe and effective as a scalable, brief, low-intensity intervention to help health-care providers and psychotherapists to reduce their suffering from moderately and severely disturbing memories. FT appeared to be safe, rapid, effective, and well-tolerated by clients. The findings support the view of FT as requiring the minimal resources and minimal demands of low-intensity interventions and possibly yielding the benefit of lasting reductions in memory-related distress. To resolve questions raised by the present findings, future FT research should include a comparison group that mimics the demand effects, an extended follow-up period, and assessment of other related symptoms beyond reactivity to the treated memory. The present study suggests that additional experiences of FT focused on the same disturbing memory may result in further benefits; repeated applications of FT and extended periods of time performing FT should be studied.

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Disclosure. The first author owns the U.S. patent on the computerized version of the flash technique referenced in this paper. The first, second, and third authors derive income from teaching the use of the flash technique to clinicians. The first author receives royalties from four books about trauma therapy and conducts trainings for clinicians in EMDR from which he derives income. The third author receives a salary in part from teaching EMDR and also receives royalties from two books on EMDR. The fourth author derives income from teaching trauma treatment to clinicians, including a modification of the flash technique. No other potential conflicts of interest were reported by the authors. This work was unfunded.

Funding. The authors received no specific grant or financial support for the research, authorship, and/or publication of this article.

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