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Effectiveness of writing interventions for the treatment of trauma: a systematic review

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EFFECTIVENESS OF WRITING INTERVENTIONS FOR THE TREATMENT OF TRAUMA: A SYSTEMATIC REVIEW

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DEDICATION

For mamma (mom) and papá (dad)

Thank you for everything you have given me to help me get to where I am today. Your love knows no limits, and I am forever grateful for your support.

I love you both.

VITA

The author, Melissa Maccarini, was born in Salerno, Italy and moved to the United States with her parents when she was six years old. She received her undergraduate degree in Psychology at the University of California—Los Angeles in 2017. After completing her B.A., she earned her M.A. in Clinical Psychology with an Emphasis in Marriage and Family Therapy at the Pepperdine Graduate School of Education and Psychology. She started working on her doctorate in clinical psychology at Pepperdine in 2021. Melissa is currently certified in cognitive behavioral therapy by the Academy of Cognitive and Behavioral Therapies. She has special interests and training in cognitive processing therapy and cognitive behavioral therapy/third-wave-approaches in the treatment of trauma, anxiety, and depressive disorders. This dissertation completes the requirements for her Psy.D. degree, and she is projected to graduate from Pepperdine University Graduate School of Education and Psychology in May 2023 and complete her pre-doctoral internship at the Long Beach Veteran Affairs Medical Center in July 2023.

ABSTRACT

The effectiveness for writing interventions in the treatment of trauma has been a long-researched topic with research continuing to be conducted. This systematic review with narrative synthesis aimed to examine the effectiveness of writing interventions over the past two decades in reducing trauma or related symptoms in adults diagnosed with PTSD or having experienced a criterion-A event. Researchers searched the following databases: PsycINFO, Scopus, EBSCO, ProQuest (PTSDPubs), and PubMed. The last search yielded 100 manually full-text screened studies, with 18 articles included in the systematic review. The results point to some evidence for statistically significant decreases in trauma or related symptoms when compared to control groups/conditions. These results can be utilized to implement writing interventions for individuals who are on a waitlist for treatment or who do not want to engage in full trauma treatment, especially since instructions do not need to be provided by a psychologist. Future research should focus on qualitative analyses as well as investigating the effectiveness of writing interventions in reducing trauma symptoms in males and more culturally diverse groups.

Keywords: writing interventions, trauma, PTSD, systematic review

Chapter 1: Background and Rationale

Statement of the Problem

According to the National Council for Behavioral Health, 70% of adults in the U.S. have experienced some type of traumatic event at least once in their lives. (National Council for Behavioral Health, 2013). Some experiences of trauma can lead to a diagnosis of Post-Traumatic Stress Disorder (PTSD) and may require specific tools to aid the client in processing their trauma; using writing is one specific intervention that can provide an alleviation of symptoms and the processing of different traumas. Related to this, about 7 or 8 out of every 100 people will develop PTSD at a point in their life. Given these statistics, it is essential to effectively treat individuals that seek out treatment and identify specific tools to aid the client in processing their trauma. There are various treatments that have been developed for trauma, and writing is one specific intervention that can provide an alleviation of symptoms and the processing of different traumas. While therapies that have been developed for trauma have research backing them, the use of writing interventions does not have nearly as much research available. It is important to consolidate the research available on writing interventions for trauma because therapy is not a one size fits all approach and having additional interventions available can be beneficial for a client. For the purpose of this review, writing interventions are defined as interventions where individuals are asked to write about a traumatic experience by including facts of the events and their deepest thoughts and feelings about the event (Pennebaker, 1997).

Written disclosure of emotional reactions to a traumatic event has various beneficial health consequences (Rosenberg et al., 2002; Stanton & Danoff-Burg, 2002). In 2017, the Veterans Health Administration and Department of Defense and the American Psychological association (APA) each published treatment guidelines for PTSD, including Prolonged Exposure

(PE), Cognitive Processing Therapy (CPT) and trauma-focused Cognitive Behavioral Therapy (TF-CBT; Watkins et al., 2018). These guidelines do not provide specific attention to using writing interventions for the treatment of trauma, despite studies that have found health benefits and improvement in PTSD symptoms for participants in writing interventions (Baikie et al., 2012; Krpan, et al., 2013). It is also important to note that trauma can cause distress and impact quality of life, whether an individual meets criteria for PTSD or not. In general, expressive writing can lead to a short-term decrease in distress, negative mood and physical symptoms, and long-term consequences have also been found regarding health benefits in objectively assessed outcomes, self-reported physical health outcomes and self-reported emotional outcomes; these include improved immune system functioning, fewer post-traumatic intrusion and avoidance symptoms, and reduced absenteeism from work, among many others (Baikie & Wilhelm, 2005).

Writing interventions may vary in how they work for different clients, and it is important to continue conducting more research on the effectiveness of these interventions. Some clients might not be prepared to verbally process their trauma and might find writing to be a better outlet for them. At the same time, some clients may receive long-term benefits from writing about their traumas in treatment, making it important to continue to research this to provide clients with the best care possible (Rosenberg et al., 2002; Baikie & Wilhelm, 2005; Pennebaker et al., 1989). Writing about a trauma can also help individuals process their trauma in a safe space while receiving additional support and resources from a therapist. Some literature suggests that writing about a trauma can help survivors gain a sense of control over their own story of what happened to them and a more resilient self-concept (Hemenover, 2003; Park & Blumberg, 2002). Writing interventions may also provide a short-term type of treatment for clients who are looking for more cost-effective solutions. It has been found that writing can facilitate meaning-making for

individuals who have experienced trauma by encouraging cognitive processing that will eventually help with changes in situational and global meaning; continued cognitive processing can help people change their views of the trauma toward less distressing perceptions (Park & Blumberg, 2002).

This proposed systematic review is intended to be useful for therapists who work on processing traumas with their clients, as it can provide more information on the effectiveness of writing interventions. It can also provide therapists with options for writing interventions that they can utilize with their clients that they might have not attempted before. Some clients enjoy writing or are more creatively inclined and might find value in this intervention. This review can also provide information to researchers about what gaps exist in the literature and what kind of research would be useful to further conduct. While there is research on writing interventions for trauma, there is room to conduct more research and collect more information to inform mental health professionals.

Current Theory and Research

Writing as a Therapeutic Process

James W. Pennebaker is considered a pioneer in the therapeutic use of expressive writing (Pennebaker, 2017). Pennebaker ran his first experiment in 1983, where he started to see the first effects of this writing intervention on students that wrote about their traumas. After this experiment, his studies became replicated both successfully and unsuccessfully, but by the mid-1990s literature regarding expressive writing was emerging consistently in various areas of psychology that validated the effectiveness of this intervention (Pennebaker, 2017). This shows the effects that this type of intervention began to have on the field that continues on to this day.

In 1997, Pennebaker reported that when individuals write about experiences that were personally upsetting to them in a laboratory setting, consistent and significant health improvements were found; these effects were seen in subjective and objective markers of health and well-being (Pennebaker, 1997). While research at the time was focused on the effectiveness of writing rather than the discovery of what mechanisms made it work, two models were set forth on how disclosure involved inhibitory and cognitive processes.

According to Pennebaker (1997), the first theory stated that not speaking about important psychological occurrences was considered to be inhibition. The inhibitory work on part of the individual could be seen as a long-term low-level stressor. The theory posited that "letting go and talking about these experiences should, in theory, reduce the stress of inhibition" (Pennebaker, 1997, pp. 164). Contrary to this, Greenberg and Stone (1992) found that individuals were able to benefit from writing about traumas they had disclosed just as much as traumas they had kept secret. Overall, the theory of inhibition had not been proven, and health changes were not always consistent after self-reports of inhibition before and after writing. The second theory looked at cognitive changes that are associated with writing. A study by Krantz and Pennebaker (1996) examining groups of students expressing their trauma through bodily movement and another group that expressed their trauma through bodily movements plus writing found that "the mere expression of trauma is not sufficient" and that "health gains appear to require translating experiences into language" (p. 164). Analyzing data from subjects from six writing studies, three linguistic factors were found to reliably predict improved physical health (Pennebaker et al, 1997). The more individuals made use of positive emotion words, the better their subsequent health. Also, the use of a moderate amount of negative emotion words were found to predict health; very high and very low levels of negative emotion words correlated with poorer health.

Lastly, an increased use of causal and insight words throughout the course of writing was strongly correlated with improved health.

Pennebaker (1997) suggests that psychotherapy in general benefits from a certain level of self-disclosure on part of the patient. Regardless of the theoretical orientation, the patient and the therapist collaborate to form a coherent story that explains the problem and, directly or indirectly, the "cure." The act of disclosing can have valuable therapeutic value in and of itself; the writing paradigm is one of various possible active ingredients that can be part of psychotherapy.

Writing Interventions for Trauma

Various writing interventions for trauma have been widely utilized with different populations as well as with different types of trauma, and various meta-analyses have supported their effectiveness (Baikie & Wilhelm, 2005; Frattaroli, 2006; Frisina et al., 2004; Harris, 2006; Smyth, 1998; Travagin et al., 2015). The writing interventions that have been tested can best be understood by examining their findings within specific groupings to organize the body of research. The research to be presented is organized according to type of trauma, comparative studies, and types of writing interventions.

An important place to begin is to note the effects of negative emotions and expressive writing on PTSD symptoms. It has been found that individuals high in trait negative emotion consistently reported greater PTSD symptoms as well as greater emotional distress versus individuals low in trait negative emotion; further, only the individuals with high trait negative emotion in the expressive writing condition showed a significant decrease in PTSD symptoms (Hoyt & Yeater, 2011). The researchers indicate that the effectiveness of writing tasks in decreasing PTSD symptoms may relate more to personality variables than the writing task itself.

The current research has been divided into relevant sections with not much emphasis on trait negative emotion. Nonetheless, this might present an important consideration in later research.

Interventions for Different Types of Trauma

The use of writing has been studied with a range of traumatic experiences. For example, Duchin & Wiseman (2019) examined the subjective experiences of child survivors of the Holocaust and analyzed the meaning Holocaust survivors placed on writing their memoirs. A narrative analysis from interviews with the survivors revealed three main dialectics: between *wordless space* and *self-narration*, between *aloneness* and *loneliness* and *the quest for connectedness*, and between the *private space* and *public space*, which were all found to be intertwined and to explain various aspects of processing a trauma narrative (Duchin & Wiseman, 2019). This sheds some insight on the processes happening in writing a memoir about a specific kind of traumatic experience, the Holocaust.

Another example is the use of Pennebaker's paradigm to investigate the effects of writing about rape among women. In evaluating his paradigm, Brown & Heimberg (2001) found that rape victims who read their narratives to another person did not experience greater improvement after one month than those who read their narrative alone, rape victims who spoke about the facts and emotions associated with their rape also did not experience greater improvement than those who only wrote facts. This suggests that writing was as effective as talking about the rape trauma. Furthermore, the study found that at the 1-month follow-up period, the number of words used in the disclosure was associated with the likelihood of telling someone about the rape, while a moderate level of written disclosure was associated with a decrease in symptoms of social anxiety.

Comparisons Between Interventions

An important research method is to compare writing interventions to first-line treatments for PTSD. While written exposure therapy (WET) has been shown to alleviate symptoms of PTSD, comparing it to a first-line treatment, such as CPT, is an important research goal. In a study with veteran and nonveteran individuals seeking treatment for PTSD, Sloan, Marx, Lee & Resick (2018) found that improvements in PTSD symptoms due to the WET condition were noninferior to improvements to a CPT condition at different assessment periods of a Clinician-Administered PTSD scale, with the largest difference assessed at a 24-week follow-up (Sloan, Marx, Lee, & Resick, 2018). Moreover, WET utilizes less sessions that CPT, and it was found to be noninferior to CPT in symptom reduction.

Eye movement desensitization and reprocessing (EMD/R) has been used as a treatment intervention in the processing of traumatic experiences. When compared to structured writing therapy, Largo-Mash & Spates (2002) found that both produce significant reductions in symptoms on dependent measures including the Impact of Events Scale (IES) and The Treatment Efficacy Expectancy Scale (TEES).

Finally, a meta-analysis found that five direct comparisons of writing therapy to a waiting-list control condition showed significant and substantial short-term reductions posttraumatic stress (PTS) conditions and comorbid symptoms (Emmerik et al., 2012). It is also of importance to note that, based on two direct comparison studies, no difference in efficacy was found between writing therapy and trauma-focused cognitive behavioral therapy, but this was based on two direct comparisons.

Writing Interventions Within Psychotherapy Treatment Protocols

There are some treatments for trauma that incorporate writing as one of their interventions that are important to mention, considering that not all writing interventions are stand alone. CPT

is considered to be a treatment for PTSD with strong research support (APA, 2017; The US Department of Veterans Affairs and Department of Defense, 2017). A recent meta-analytic review also indicated that CPT is an effective treatment for PTSD with lasting benefits (Asmundson, 2018). In CPT with written accounts, the first written account occurs during the client's fourth session where they are asked to handwrite what happened during their index trauma, from the time they realized they were in danger up until the trauma was over (Resick et al., 2017). The written account is usually about eight pages long but can vary, and the client is instructed to write in past tense. After writing the trauma narrative, the client is asked by the therapist to read it aloud while the therapist listens without commenting in order for the client to experience the natural emotions resulting from the trauma (Resick et al., 2017). When the client is done reading the trauma, the therapist gives space for the client to process any natural emotions before engaging in Socratic questioning to work through stuck points. During the fifth session, the client is asked to write a second written account of the trauma again with any details that may have been left out, and the same structure as session four is implemented (Resick et al., 2017).

Writing is also used in *Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)* is an evidence-based treatment that was developed for children and adolescents who have experienced trauma and their parents/caregivers (The National Child Traumatic Stress Network, n.d.). This type of treatment begins with an assessment of trauma history, followed by psychoeducation about symptoms of trauma and how TF-CBT treatment works (The National Child Traumatic Stress Network, n.d.). The parent is involved in parts of treatment in order to learn how to apply positive parenting at home, learn skills, and identify problem behaviors. Furthermore, the child or adolescent is taught relaxation techniques and how to increase their capacity to identify

feelings, have feelings vocabulary, and link these to the appropriate expression (affective modulation; The National Child Traumatic Stress Network, n.d.). For children that are old enough, a written narrative is assigned, with the first chapter being the facts of the traumatic event and the second draft including the thoughts and feelings about what happened. The final draft includes an emphasis on the worst moments of the identified trauma as well as a closing paragraph about where the client is at currently. TF-CBT also includes in-vivo exposure, the opportunity for the client to share their trauma with their parents/caregivers, and a safety plan. TF-CBT has demonstrated positive outcomes in reducing symptoms of PTSD (de Arellano, et al. 2014; Cary & McMillen, 2012; Lenz & Hollenbaugh, 2015; Scheeringa et al., 2010).

Writing-Focused Interventions

There are various psychotherapies that have been found to be effective in treating PTSD, but it is important to investigate writing-focused interventions for clients who do not respond desirably to currently developed therapies or do not have access to therapists who can deliver them competently (Sloan et al., 2015). Different writing interventions have been studied to determine their efficacy, such as NET, written disclosure (expressive writing), and interapy (structured writing therapy). Various studies have been conducted to examine the efficacy of interapy, but only two studies by Knaevelsrud & Maercker (2007) and van Emmerik et al. (2008) have examined its effects on individuals with confirmed or probable PTSD. Furthermore, these two studies were conducted by utilizing a waitlist comparison condition or a similar comparison group. While findings have seemed promising, active treatment comparisons in studies would provide better support. Findings have also suggested across studies that more than 3 sessions of 20-minute duration are needed to achieve a beneficial outcome for PTSD individuals (Sloan et al., 2015).

There are other kinds of writing interventions that have been used in studies with individuals who have experienced traumatic events. WET is one of these interventions, which is considered to be a modified version of Pennebaker's expressive writing intervention developed by a group of researchers (Sloan & Marx, 2017). WET incorporates two primary changes. The first is the addition of a psychoeducation component to inform patients about core symptoms of PTSD, as well as how it is developed and maintained. This provides a rationale for patients on why writing about a traumatic experience can reduce PTSD. The second addition was to include five, 30-minute writing sessions that instructed individuals to write using a distance perspective (looking back upon the trauma). This writing intervention was used on individuals with PTSD related to motor-vehicle accidents, who experienced significant reductions in PTSD symptoms compared to individuals assigned to a waitlist group (Sloan & Marx, 2017).

Expressive writing has been studied in terms of its effect on PTSD symptoms. Expressive writing appears safe to use with individuals with a diagnosis of PTSD with significant improvements seen in mood and post-traumatic growth as well as greatly attenuating neuroendocrine (cortisol) responses to trauma-related memories (Smyth et al., 2008). Another type of writing intervention, utilizing a future-oriented writing therapy approach on self-regulation topics such as goal setting and personal behaviors has also been evaluated. In this intervention, participants engaged in 8 weekly sessions for 90 minutes by Masters or Ph.D. level psychology students that included psychoeducation, writing tasks, post-writing reflections, and nondirective supportive counseling. Participants were asked to write for 40 minutes during their session, and the topics included goals for therapy, controllability and ability to exercise personal control, goal setting, social support and important people in one's life, interpersonal view, and life goals. These topics targeted core features of PTSD, such as a sense of uncontrollability and

social isolation, and aimed to enhance self-efficacy through self-regulation and goal setting. This type of writing therapy has been found to significantly decrease PTSD severity, depression, and unhelpful trauma-related cognitions (Nixon & Kling, 2009).

Internet-Delivered Writing Interventions Writing interventions can be delivered in various formats, including through the internet. Stockton et al. (2014) focused on Internet-based writing interventions to investigate the impact of expressive writing on posttraumatic growth. Writing about one's thoughts and feelings, when compared to writing about neutral topics, was shown to lead to statistically significant increases in growth reported from baseline to an 8-week follow when growth is assessed using The Psychological Well-Being—Post-Traumatic Changes Questionnaire (PWB-PTCQ) but not the Posttraumatic Growth Inventory—Short Form. Relatedly, using more insight words led to an increase in posttraumatic growth. At the same time, further analyses revealed that using more insight words was associated with a greater increase in avoidance throughout the study while an increased use of causal words from the first writing session to the third was associated with reductions in posttraumatic growth (Stockton et al., 2014). These findings support the suggestion by Owen et al. (2006) that cognitive processing of restricted emotional expression is not sufficient in resolving distress if the individual intellectualizes the experience in order to cope.

Internet-based writing has also been tested on veterans for PTSD. In a study conducted by Krupnick et al. (2017), veterans in a specific study were administered an online intervention of therapist-guided writing utilizing principles of prolonged exposure and cognitive therapy as an adjunct to face-to-face psychotherapy. Findings demonstrated preliminary evidence of the effectiveness of mental health treatment plus online intervention for a population of veterans, which was particularly effective in targeting PTSD symptoms of hyperarousal. This is an

important study, as some veterans diagnosed with PTSD may have difficulty completing a full face-to-face course of therapy.

Veterans have been particularly targeted as a population of interest in various writing intervention studies, specifically ones delivered online (Frankfurt et al. 2019; Sayer et al., 2015; Sloan & Marx, 2017). Expressive writing has been investigated in veterans with reintegration difficulties; reintegrating into society is a fundamental part of treating PTSD, to help the individual regain normal functioning. Non-therapist assisted expressive writing may be best used with veterans who have subclinical PTSD symptoms, as decreased distress after writing was reported for veterans without probable PTSD at baseline but was not as likely reported by veterans with probable PTSD (Frankfurt et al., 2019). Furthermore, in a study where U.S. Afghanistan and Iraq war veterans were randomly assigned to an expressive writing condition, a factual control writing condition, and a no writing condition, it was found that veterans in the expressive writing condition experienced greater reductions in physical pain, anger, distress, and PTSD symptoms (Sayer et al., 2015). Overall, these studies conducted on veterans point to some evidence of benefits of utilizing writing interventions for trauma.

Rationale, Primary Aim, and Key Research Questions

The current research appears to be mixed on the effectiveness of utilizing writing interventions to target trauma and PTSD symptoms. It is clear that many studies could benefit from using an active treatment comparison group instead of a waitlist or similar control condition. At the same time, the studies that have compared writing interventions to other treatments have proved to be promising in the effectiveness of incorporating or using writing as a way to process trauma in psychotherapy. Internet-delivered writing interventions have been a particular point of focus for veterans (Frankfurt et al. 2019; Sayer et al., 2015; Sloan & Marx,

2017). While more research is needed, there is some suggestion that writing can be useful as an adjunctive type of treatment, while less evidence has been found for its usefulness in helping veterans with probable PTSD re-integrate into society. There is also suggestion that different types of writing interventions can be useful for targeting trauma, but more research needs to be done to establish this more soundly.

Overall, this systematic review aims to synthesize the literature for writing interventions that have been utilized for trauma, paying particular attention to effectiveness by answering these questions:

- RQ1: What are the types, characteristics, and qualities of writing interventions for trauma that are available?
- RQ1a: Do these types, characteristics, and qualities vary by the type of trauma?
- RQ2: What is the impact/outcome of utilizing writing interventions for trauma?
- RQ2a: Do these outcomes vary based on characteristics of the population?
- RQ3: What elements influence the effectiveness of writing interventions?

Chapter 2: Methodology

Systematic Review Approach

A systemic review with narrative synthesis approach was utilized to assess the effectiveness of writing interventions in the treatment of trauma. This type of review was deemed most appropriate for the research questions guiding the current study due to the ability to provide a detailed, descriptive summary of the types of writing interventions and their effects and outcomes studied. The Preferred Items for Systematic Review and Meta-Analyses (PRISMA-P) was used to inform the development and implementation of this systematic review.

Eligibility Criteria

All studies that were part of this review were published, peer-reviewed articles written in English between the years of 2000-2021. This range was based on a preliminary review of existing literature that showed that this span of years included important studies that were conducted on the topic. In order to be considered for the review, studies had to have included individuals with PTSD or who have experienced a Criterion A traumatic event, including those who might have a diagnosis different from PTSD or report sub-clinical trauma symptoms. For an event to be considered a traumatic event, it had to meet criteria based on the DSM-IV or DSM-5 Criterion A stressor. Based on the DSM-IV, an individual must experience exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate (4th ed.; DSM–IV; American Psychiatric Association, 1994). Based on DSM-5 criterion, an individual must have been exposed to death,

threatened death, actual or threatened serious injury, or actual or threatened sexual violence by direct exposure, witnessing the trauma, learning that a relative or close friend was exposed to a trauma, or indirect exposure to aversive details of the trauma, usually in the course of professional duties (5th ed.; DSM–5; American Psychiatric Association, 2013). To meet this inclusion criterion, participants in a study could have had scores on relevant measures that indicate trauma.

The next inclusion criterion was that the writing intervention employed for the treatment of trauma could be stand alone or part of psychotherapy that incorporated writing interventions if the writing intervention effects were evaluated by themselves. In the writing instructions, individuals must have been asked to write about a traumatic experience by including facts of the event(s) and their deepest thoughts and feelings about the event. They could be asked to write about additional elements of the traumatic event.

The remaining inclusion criteria were that the intervention did not need to be provided by a licensed mental health professional. The writing intervention could be incorporated in an individual format or in a group format (when applicable) to adults (age 18 and up) in any setting, such as private practices, hospitals, treatment facilities, veteran administration sites, online, research labs or any sites/methods that offer therapy. Finally, only quantitative studies were considered for inclusion.

Exclusion Criteria

The review excluded any studies that included both children and adults if the data from adults was not separated from the children's data. Moreover, any studies that included individuals taking any type of psychiatric medication during the writing intervention (if reported) whose effects cannot be separated from those of the writing intervention were excluded as well.

This was in order to evaluate the effectiveness of writing interventions strictly for adults who were receiving a treatment where writing was included, receiving adjunctive services that included writing interventions, or were in a group utilizing writing interventions.

Search, Screening and Selection Process

The databases that were utilized to carry out the search with the same search strategy were the following: PsycINFO, Scopus, EBSCO, ProQuest (PTSDPubs), and PubMed. The identified keywords were listed in a search terms worksheet based on a preliminary search of the literature, with each term having its own identification (ID) number (Appendix A). The following search terms were selected because they are synonyms for the research variables and were also relevant to how the research variables were operationalized for this study. For "*trauma*," synonym terms included "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress" OR "posttraumatic stress disorder" OR "posttraumatic growth." For "*writing*," synonyms will include "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "journaling" OR "journal therapy" OR "narrative writing" OR "narrative" OR "written disclosure." For "*quantitative study (or research)*," synonyms will include "empirical study/research," "treatment study/research," "outcome study/research", "efficacy study/research" and "effectiveness study/research."

The search plan spreadsheet (Appendix B) includes the search type, databases or sources used, search term ID numbers, search or syntax instructions, fields to search, specifiers, and plan notes. This spreadsheet was used to log articles that were taken under consideration for the systematic review. Different searches were used for the different databases. For PsycInfo and EBSCO (Alt Health Watch) the following search were conducted: "trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress" OR "posttraumatic stress disorder" OR

"posttraumatic growth" AND "writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "journaling" OR "journal therapy" OR "narrative writing" OR "narrative" OR "written disclosure." For Scopus, ProQuest (PTSDPubs), and PubMed, the following search was conducted: "trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress" OR "posttraumatic stress disorder" OR "posttraumatic growth" AND "writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "journaling" OR "journal therapy" OR "narrative writing" OR "narrative" OR "written disclosure" AND "quantitative study/research" OR "empirical study/research" OR "treatment study/research" OR "outcome study/research" OR "efficacy study/research" OR "effectiveness study/research."

The search documentation record (Appendix C) was used to keep track of the syntax and specifiers for each search conducted. It includes the search date, full search ID number, the type of search, the database/source used, search term ID numbers used, the search syntax or other guidelines used in the search, fields searched, search specifiers that include the years and the type of publication, and the number of records generated from the search.

The screening and selection record (Appendix D) was used to track the articles that were being evaluated for being part of the study. This record was used to first screen the title/keywords/abstract of every study. This included an evaluation of the year, title of the article, databases/sources, and keywords, as well as a review of the abstract. Studies that clearly did not meet eligibility criteria based on this information were excluded. This was followed by a full-text review of remaining studies for eligibility applying the specific inclusion and exclusion criteria. Finally, a decision on whether the study was selected for the systematic review was made. Any questionable studies identified by the researcher were settled through a discussion with the

dissertation chair. In addition, a random sample of 10% of the studies was evaluated independently by the chairperson for inclusion as a validity check. The decision, the date of this decision, and any notes that were relevant to the final decision were documented on the spreadsheet. The reason for exclusion of all studies not selected for the systematic review was documented as well. A PRISMA flow diagram contains information regarding the process of identifying, screening, assessing eligibility and final inclusion of studies (see Appendix E).

Data Collection and Extraction

The data collection and extraction form was derived from a template provided by the author's doctoral program that adapted a form developed by Cochrane Effective Practice and Organisation of Care (EPOC; Cochrane Effective Practice and Organisation of Care, 2020). The template was individualized for the proposed study, pilot-tested and modified by this author (MM; Appendix E). Each individual data collection and extraction form contained a document ID number, the name of the author(s) and the year of publication of the article, the full document title, and the research variables of the study. The date of the form completion and initials/ID of the person extracting the data were recorded. General information was extracted, including source/publication type, source name, publication status, and the language the document was written in.

Information regarding design characteristics and methodology was extracted, including the aim of the study, the general method, design or specific research approach, and additional data regarding the type of quantitative study and the overall duration of treatment. Data on the research variables was collected, including symptoms of trauma targeted by the intervention and changes in symptoms of trauma after the intervention. More information was extracted regarding study participant characteristics and recruitment, including population of interest, recruitment

methods, sample size, age, gender, ethnicity, with the addition of severity of trauma. Data for setting characteristics was also extracted and documented, including study location and the data collection setting.

Furthermore, information that was extracted from the included studies included the addition of characteristics of the writing intervention in the form. Number of sessions, frequency of sessions, setting of the intervention, individual(s) who conducted the intervention, type of intervention, the nature of the writing intervention (stand alone or incorporated as part of a trauma intervention that incorporates writing), and a description of the intervention was included. A section on the analysis conducted in the studies included a modification that included the statistical power, effect size, writing intervention results, and statistical methods used. Additional findings/results were also be recorded in additional results section on the form as well as conclusions and follow-ups, including key conclusions of study authors, study author's recommendations for future research, general takeaways, takeaways regarding implications for practice, and salient study limitations.

Quality Appraisal

Quality appraisal is helpful for judging the trustworthiness, value, and relevance of scientific research carefully. For this review, the McMaster Critical Review Form for Quantitative Studies was used. It was developed by the McMaster University Occupational Therapy Evidence-Based Practice Research Group (Law et al., 1998; Appendix F). The form has questions split into sections: study purpose, literature, design, sample, outcomes, intervention, results, and conclusions and clinical implications. Each section has space for comments as well as the ability to check off "yes" or "no" to whether different elements were present in the study.

Most of the studies included in this review were rated highly in terms of quality appraisal

(see Appendix H, Table H1). Ratings were first made by 3 research assistants, after which the author (MM) rated all included studies without knowledge of the previous rating. Interrater reliability was 100% for the total quality appraisal scores.

Data Management, Synthesis and Analysis Plan

This systematic review utilized a central database where data from included studies was stored and managed. This database was an Excel spreadsheet using the variables included in the Data Extraction form, which contained all extracted data from the quantitative studies. Data for each study from the McMaster Critical Review Form for Quantitative Studies was also input into the Excel database. This allowed the combination of all included studies into one document.

A focused database was developed for the research questions. Data pertaining to each research question was reviewed and key findings related to the research question were identified. Lastly, the author categorized the results to make relevant comparisons, such as by writing intervention type, effect size, or reduction in symptomology. These clusters helped in identifying any relevant patterns, themes, or relationships in the published literature. Once the data for each research question had been analyzed, summaries of what had been found for each research question were populated into Evidence Tables organized by studies, which allowed for the concise organization of the literature. The Evidence Table that was developed to present the results of this systematic review can be seen in the appendix (Appendix H, Table H2). The following pieces of information were reported from each study reviewed: Author(s), Population Characteristics, Type of Trauma, Type of Writing Intervention, Writing Intervention Characteristics, Control/Comparison Groups, Outcome Measures, and Results/Main Findings. Key findings for each study were also be reported.

Chapter 3: Results

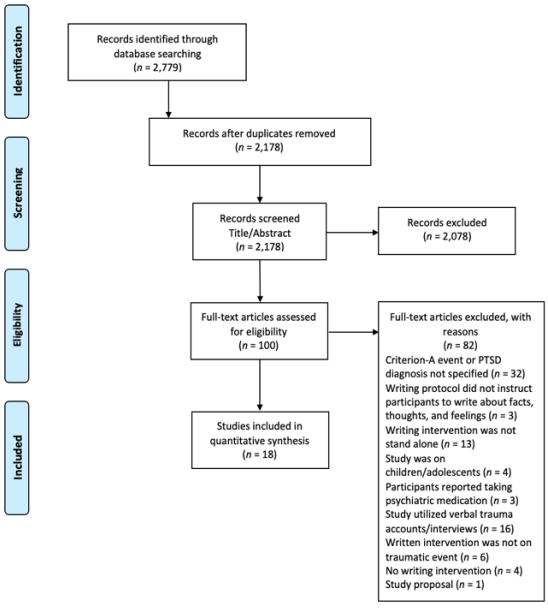
Study Selection

A total of 2,779 articles were yielded from online databases (PsycINFO, Scopus, EBSCO, ProQuest [PTSDPubs], and PubMed). From these records, 603 duplicates were found and removed utilizing an online tool named Rayyan (Ouzzani et al., 2016). After a review of title and abstracts, a further 2,078 records were excluded, resulting in a total of 100 articles for full-text review. Once full-text reviews were conducted, 82 studies were excluded, leaving a total of 18 studies for inclusion in the systematic review. Reasons for exclusion at the full-text screening stage are included within the PRISMA Flow Diagram (Figure 1).

Title and abstract screening were performed by one researcher (MM) and three research assistants (KV, AM, VP). Full-text articles were screened independently by one researcher (MM). A secondary review decision of 10% of the final included studies was conducted by the dissertation chair (NT).

Figure 1

PRISMA Flow Diagram



Characteristics of Included Studies

Participants and Study Characteristics

Sixteen studies were conducted in the United States (89%) and two studies were conducted in Europe (11%): one in the United Kingdom and one in the Netherlands. Altogether, the 18 studies included 2,305 participants with age ranges from 18-84. Two studies did not specify gender in their sample (Aldridge & Range, 2005; Sloan et al., 2011); of the rest of the sample across studies, 89% identified as female. The mean sample size across studies was 128, but the mean sample size was reduced to 67.5 when removing the largest participant sample (Paquin et al., 2021). The largest sample accounted for 47% of participants across the 18 studies. Due to the extreme variability in sample sizes ranging from 24 to 1,090 and the presence of a right skewed distribution, a median sample size of 86 was calculated.

Of the 16 studies that identified gender of the sample size, the majority of participants were female. Only one of the studies had predominantly male participants since the study focused on combat trauma in veterans (Possemato, 2011). The participant sample in seven studies was solely female (Chu et al., 2019; Chu, Wu, & Lu, 2020; Chu, Wu, Tang et al., 2020; Craft et al., 2012; Gallagher et al., 2018; Mosher et al., 2012; Paquin et al., 2021). A range of ethnicities was represented across the studies: Caucasian, Hispanic, Asian, Asian American, Chinese, Chinese American, African American, American Indian, Alaska native, Native Hawaiian/Pacific Islander, other/multiracial. Four of the 18 studies had samples that were predominantly white (>57% of the sample) and three studies included 100% Chinese American individuals (Chu et al., 2019; Chu, Wu, & Lu, 2020; Chu, Wu, Tang et al., 2020). Four of the 18 studies did not provide socioeconomic status information. The rest of the studies identified mean annual incomes ranging from less than $25,000 to more than $100,00 and education level ranged

from a high school diploma to some form of college degree. The participant pool included both single and married individuals as well as unemployed and employed participants (part-time or full-time.)

Writing Interventions and Type of Trauma

The 18 included studies utilized various writing interventions, and the writing instructions given to participants varied between the studies. Detailed informed regarding the characteristics of the writing interventions can be found in the Appendix (Table H2). In four studies the writing intervention was delivered and completed online (Paquin et al., 2021; Possemato et al., 2011; Stockton et al., 2014; Truijens & van Emmerik, 2014). In the rest of the studies the writing intervention was completed either in participants' homes or in a private room on site where the study was being conducted. In terms of the type of trauma being treated, the studies focused on different types of traumatic events (See Appendix H, Table H2).

Measures of Trauma Symptoms in Randomized Control Trials (RCTs)

The 11 RCTs in this systematic review compared different writing interventions to various clinical controls: waitlist, neutral writing, and no writing. All of the measures that were used in the RCTs were reported as valid and reliable (See Appendix H, Table H2).

RQ1: Types, Characteristics, and Qualities of Writing Interventions

All 18 studies addressed RQ1 in terms of providing information on the types, characteristics, and qualities of the different writing interventions that were used (Appendix H, Table H2). The majority of studies (67%) used an expressive writing protocol while the rest of the studies used written emotional disclosure, written exposure therapy, or written imaginal exposure (34%). The writing protocols all instructed participants to write about their deepest thoughts and feelings, but some studies provided additional writing instructions. The length of

time participants spent writing, the number of writing sessions, and the time between writing sessions varied across studies. Time spent writing ranged from 10 minutes to 45 minutes (M = 25.5 minutes). The number of writing sessions varied from one session to five (M = 3.2 sessions). Lastly, the time between writing sessions ranged from 15 minutes to a week (M = 3.5 days).

Expressive Writing

Twelve studies used expressive writing as their intervention, which was developed by James W. Pennebaker (Pennebaker & Beall, 1986). The protocol focuses on expressing one's deepest thoughts and feelings about difficult experiences. All expressive writing paradigms used in these studies instructed participants to write about their thoughts and feelings regarding a traumatic event. While all these studies asked participants to write about their thoughts, feelings, or both regarding a traumatic event, some studies had additional writing instructions given to participants that made the protocols different between studies (See Appendix H, Table H2).

Written Emotional Disclosure

Written emotional disclosure was developed by Pennebaker et al. (1986, 1997) and individuals typically write about their most traumatic experience for a duration of 20 minutes during three writing sessions held on successive days. Participants are asked to include descriptive and emotional information. WED is theorized to have similar mechanisms of action as exposure-based therapy (Sloan et al. 2005, 2007). All three studies followed the 20-minute writing sessions during three consecutive days protocol. Two of the three studies asked individuals to write out their deepest thoughts and feelings. One study only asked individuals to focus on their deepest emotions.

Written Exposure Therapy

Written exposure therapy (WET) was created by Denise M. Sloan and Brian P. Marx, borrowing from Pennebaker's written disclosure in its earliest forms. In WET, the individual confronts the trauma memory through an explicit writing protocol. It is theorized through emotional processing theory that individuals experience fear activation during the initial writing session followed by significant reductions of fear activation by the last session, which creates new learning in between sessions (Sloan & Marx 2004; Sloan et al., 2005, 2007). Studies by Sloan et al. (2012) and Wisco et al. (2016) followed the standard WET protocol with the same instructions, which included delving into deepest emotions and thoughts and providing details about the accident.

Written Imaginal Exposure

In written imaginal exposure, individuals are typically asked to describe a traumatic experience in first person and present tense and focus on the sensory experiences during the traumatic event (Van Emmerik et al., 2008). The idea behind this writing protocol is that the trauma narrative remains visible to the individual while writing and functions as "visual feedback for the reuptake of traumatic content during the production of the trauma narrative" (Van Emmerik et al., 2008, pp. 404). Truijens and van Emmerik (2014) tested the visual feedback hypothesis, which states that the visual feedback component from written trauma narratives contributes to the efficacy of written imaginal exposure.

RQ1a: Types, Characteristics, and Quality Variations by Type of Trauma

The included studies used various types of writing interventions for different types of traumatic events. It does not appear that the types, characteristics, or qualities of writing interventions vary according to the type of trauma. The researchers in all the studies cited

previous research as reasoning as to why they chose to utilize a specific type of writing intervention. The rationale for using a specific writing intervention was not based on the type of trauma reported by participants.

For example, studies utilizing an expressive writing protocol cited various research studies that have found benefits in individuals who utilized expressive writing through improved physical and psychological health (Fivush et al., 2003; Greenberg & Stone, 1992; Pennebaker & Beall, 1986; Pennebaker & Francis, 1996; Pennebaker et al., 1997; Pennebaker, 2004). Aldridge and Range (2005), Honos-Webb et al. (2006), Koopman et al. (2005), and Smyth et al. (2008) wanted to further explore benefits of using expressive writing. Stockton et al. (2014) also cited this same research and provided the rationale for using expressive writing to focus on posttraumatic growth (positive psychology) versus the more traditional focus psychological research has placed on disorder and deficiency. Paquin et al. (2021) stated that expressive writing is a simple intervention that can be remotely delivered without requiring clinician feedback that could aid post-disaster recovery.

It is important to note that all studies that focused on breast cancer-related PTSD utilized expressive writing as an intervention. All studies had a common theme of wanting to further explore how effective expressive writing is in decreasing PTSD in individuals diagnosed with cancer. Craft et al. (2012) and Mosher et al. (2012) indicated wanting to find more evidence for the effectiveness of expressive writing in women with breast cancer. Chu et al. (2019) stated that previous research indicated that the benefits of expressive writing on cancer patients' physical and psychological well-being may vary across cultures. They specifically wanted to look at the role of acculturation in moderating the effect of expressive writing among Chinese American breast cancer survivors. In another study, Chu, Wu, & Lu (2020) wanted to evaluate a culturally

sensitive expressive writing intervention, indicating that there are few intervention studies for cancer-related PTSD among Asian cancer survivors. A last study by Chu, Wu, Tang et al., (2020) cited that there has been literature that has demonstrated the effectiveness of expressive writing interventions in reducing PTSD in breast cancer survivors. In this study they wanted to examine how three PTSD symptom clusters influence each other after an expressive writing intervention. Gallagher et al. (2018) wanted to extend prior work that has been done and determine whether expressive writing is effective in reducing symptoms of PTSD and facilitating posttraumatic growth in Asian American breast cancer survivors.

Studies utilizing the WED protocol also cited research that has shown that this intervention has led to improvements in physical and mental health symptoms (Frattaroli, 2006; Fristina et al., 2004; Sloan et al., 2005, 2007). At the same time, it was noted in the included studies that some of the studies evaluating WED effectiveness with PTSD samples have found mixed results (Schoutrop et al., 2002; Sloan et al., 2004; Smyth et al., 2008). The three included studies in this systematic review by Possemato et al. (2011), Sloan et al. (2011), and Zakowski et al. (2014) all examined different types of traumatic events with the purpose of finding more evidence for the effectiveness of WED in reducing PTSD symptoms.

Sloan et al. (2012) and Wisco et al. (2016) both examined motor-vehicle accident-related trauma. Wisco et al. 2016 followed the WET protocol presented by Sloan et al. (2012) given that this protocol was developed by Denise M. Sloan and Brian P. Marx. In this study like all the ones included in this systematic review, the type, characteristics, and qualities of the writing intervention did not vary by the type of trauma that was being examined. WET was selected as the intervention in these studies to test it as an alternative evidence-based treatment (EBT) for PTSD, given that some PTSD patients do not respond well to EBTs that are available. The only

study examining written imaginal exposure by Truijens and van Emmerik (2014) selected this writing intervention to test the visual feedback hypothesis; the protocol selected was not influenced based on the type of trauma.

RQ2: Effectiveness/Outcome of Utilizing Writing Intervention for Trauma

Eleven RCTs best addressed RQ2 in terms of effectiveness of utilizing writing interventions for treating trauma or related symptoms (Chu, Wu, & Lu, 2020; Gallagher et al., 2018; Mosher et al., 2012; Koopman et al., 2005; Paquin et al., 2021; Sloan et al., 2011, 2012; Smyth et al., 2008; Stockton et al., 2014; Truijens & van Emmerik, 2014; Zakowski et al., 2004).

Overview of Significant Results from RCTs

The range of *p*-values in the studies was from $p < .001$ (Sloan et al., 2012) to $p = .584$ (Paquin et al., 2021), with four studies reporting a nonsignificant *p*-value (Gallagher et al., 2018; Mosher et al., 2012; Sloan et al., 2011; Smyth et al., 2008). From the 11 RCTS, the mean *p*-value associated with the effectiveness of writing interventions on decreasing symptoms of trauma and related symptoms from pre- to posttest was estimated as $p < 0.16$, suggesting the effect of the intervention did not approach statistical significance ($p = .05$). Only five studies of the 11 provided effect sizes for writing intervention versus control groups (Chu, Wu, & Lu, 2020; Gallagher et al., 2018; Mosher et al., 2012; Paquin et al., 2021; Sloan et al., 2012), and they ranged from 0.05 to 3.49.

To provide more context for the outcomes of effectiveness, findings from the studies are presented by outlining key components of each study's methodology followed by associated quantitative results. Table 1 shows an overview of the studies included in RQ2. Studies are reported and grouped based on the type of writing intervention. Expressive writing studies made up the majority of RCTs (67%, $n = 8$ of 12) so their results are reported first followed by written

emotional exposure, written exposure therapy, and written imaginal exposure studies. Within the writing interventions, studies with significant findings are reported first followed by studies with non-significant findings.

Table 1

P-Values and Effect Sizes Across RCTs

Researchers	*P*-value	Effect size	Strength of effect	Writing Intervention Type
Sloan et al. (2012)	<.001	3.49	*Large*	Written Exposure
Sloan et al. (2011)	Not significant	*Not provided*	*Not provided*	Written Emotional Exposure
Zakowski et al. (2004)	>.1	*Not provided*	*Small*	Written Imaginal Exposure
Truijens & van Emmerik (2014)	.22	*Not provided*	*Not provided*	Written Imaginal Exposure
Smyth et al. (2008)	<.05	*Not provided*	*Not provided*	Expressive Writing
Paquin et al. (2021)	0.584	0.05 (no writing)	*Small*	Expressive Writing
Stockton et al. (2014)	.022	*Not provided*	*Not provided*	Expressive Writing
Gallagher et al. (2018)	Not significant	0.25	*Small*	Expressive Writing
Mosher et al. (2012)	Not significant	0.60	*Moderate*	Expressive Writing

Researchers	*P*-value	Effect size	Strength of effect	Writing Intervention Type
Koopman et al. (2005)	.05	*Not provided*	*Not provided*	Expressive Writing
Chu et al. (2020a)	.027	.45	*Small*	Expressive Writing

Expressive Writing Outcomes

Koopman et al. (2005). This team of researchers examined the effects of expressive writing on depression, posttraumatic stress disorder, and pain symptoms among 47 female (Age range = 21-56 years; mean age = 36.5) survivors of intimate partner violence (IPV). The expressive writing condition was found to significantly interact with depression ($p = .05$). The women who were more depressed at baseline demonstrated significantly greater decreases in depression when they were assigned to expressive writing versus the neutral writing condition.

Smyth et al. (2008). Smyth et al. (2008) recruited participants with a diagnosis of PTSD ($N = 25$). Males had war or combat trauma and females had PTSD from sexual assault. Most of the participants were Caucasian (21; 84%), with the remainder being Native American (4; 16%). No significant group differences in PTSD symptom changes existed. Both groups had (non-significant) decreases in re-experiencing, avoidance, and hyperarousal from baseline to follow-up. Smyth et al. (2008) found that "participants in the experimental group reported significantly greater reductions in tension and anger ($p < .05$) than participants in the control group" (pp. 89).

Stockton et al. (2014). This study compared Internet-based expressive writing to a control writing group in a largely White female sample of adults (*N = 24;* age range = 19-63 years, mean age = 33.18; 96% female; 95.8% white) who had experienced different traumatic events. Significant *p*-values were reported in PWB-PTCQ change scores between expressive writing and control groups ($t = -2.490$, $p = .022$, with control participants reporting a slight increase in PWB-

PTCQ scores over the course of the study period (M = -1.75, SD = 6.27) and expressive writing participants reporting an increase in PWB-PTCQ scores from baseline to 8-week follow-up (M = 5.50, SD = 6.72).

Paquin et al. (2021). This study focused on 1090 perinatal women (age range = 18-45) to improve PTSD symptoms following Hurricane Harvey. The intervention was not found to have significant effects on levels of posttraumatic stress symptoms at 2 months post-intervention (p = 0.584). Expressive writing was associated with non-significantly higher post-traumatic stress levels at 2 months compared to neutral writing [d = 0.10 (95% confidence interval (CI): -0.07, 027)] and compared to no writing [d = 0.05 (95% CI: -0.11, 0.21)]. Neutral writing was associated with non-significantly lower post-traumatic stress levels at 2 months compared to no writing [d = −0.05 (95% CI: −0.21, 0.11)].

Chu et al. (2020a). Chu et al. (2020a) evaluated an expressive writing intervention for PTSD among Chinese American breast cancer survivors recruited in the US (N = 136; age range = 34-84 years; M = 57.75). For reexperiencing, there was a significant group main effect (F = 3.75, p = .027). For hyperarousal, there was a significant group main effect (F = 3.75, p = .027). Specifically, hyperarousal was lower in the enhanced self-regulation group than the cancer-fact group at the 3-month follow-up (t = − 2.49, p = .041). For avoidance, there was a significant group main effect (F = 4.15, p = .019); avoidance was lower in the enhanced self-regulation group than the cancer-fact group at the 3-month follow-up (t = − 2.89, p = .013).

Mosher et al. (2012). Women with metastatic breast cancer (N = 87) were assigned to an expressive writing or neutral writing condition. No effects of the writing group on psychological well-being (general distress, depressive symptoms, and anxiety) and physical well-being (sleep) were found.

Gallagher et al. (2018). This study examined the impact of expressive writing in reducing PTSD symptoms and facilitating posttraumatic growth (PTG) in 96 Chinese American breast cancer survivors (age range = 37-77; mean age = 54.54). All participants in this sample were recruited in the US but were foreign born, the majority in China (62.5%) or Taiwan (20.8%). When participants were last assessed, "there were small and statistically nonsignificant effect size differences such that the cancer facts condition had lower levels of posttraumatic stress symptoms than the self-regulation (d = −.33; 95% CI −.81: .16) and emotional disclosure conditions (d = −.31; 95% CI −.79: .17), and the cancer facts (d = .25; 95% CI −.23: .73) and emotional disclosure (d = −.23; 95% CI −.27: .72) conditions had higher levels of PTG than the self-regulation condition" (Gallagher et al., 2008, pp. 1678).

Written Emotional Exposure Outcomes

Sloan et al. (2011). Sloan et al. (2011) examined the efficacy of written emotional exposure in undergraduate students (N = 42; mean age = 18.9) with PTSD who had experienced different traumatic events. Participants were racially diverse, with the sample consisting of 24 Caucasian, 9 African American, 4 Hispanic, 3 Asian American, and 2 "other" or mixed racial background individuals. For the PSS-I, findings indicated a significant main effect for time (F[1,40] = 25.18, p <.001, $r_{effect\ size}$ = .61), such that all participants reported a decrease in PTSD symptom severity from baseline (M = 24.99, SD = 5.3) to the 1-month follow-up assessment (M = 15.50, SD = 8.7). Examination of the percentage of participants who met PTSD diagnostic criteria at follow-up assessment indicated no significant between-group difference (WED = 67%; control = 78%; x^2 = 0.33).

Zakowski et al. (2004). The researchers set out to examine whether written emotional disclosure would reduce distress among cancer patients (N = 104; age range = 25-84 years; M =

59.75; 51.9% female, 95.2% Caucasian). The main effects for experimental condition were found to be nonsignificant (p >.1).

Written Exposure Therapy Outcomes

Sloan et al. (2012). Sloan et al. (2012) examined the efficacy of a brief, written exposure therapy for PTSD in motor vehicle accident survivors (N = 46; Mean age = 40.65 years; 65% women). Participants' racial backgrounds were diverse with Caucasian, African American, Hispanic, Asian American, and mixed racial background identified individuals. There was a significant Condition x Time interaction (B = -17.96, 95% CI -13.04 to -22.89) on the total CAPS score such that individuals in the WET condition reported significantly greater decreases in PTSD symptom severity across time than individuals in the WL condition. Examination of PTSD diagnostic status indicated that significantly fewer WET participants met diagnostic criteria at the 6-week (x^2 = 37.66, p < 0.001), and 18-week (x^2 = 22.49, p < 0.001) assessment relative to the WL participants (6 week: 5% vs. 88%; 18 week: 0% vs. 67%). Moreover, none of the WET participants met diagnostic criteria for PTSD at the 6-month follow-up assessment.

Written Imaginal Exposure Outcomes

Truijens & van Emmerik (2014). A college sample (N = 61) in Amsterdam with PTSD was randomly assigned to different writing conditions. No significant interaction effect between time and condition was observed for IES total scores, F(2, 58) = 1.569, p = .22. This indicates that the trauma-focused writing assignments did not yield more symptom reduction than non-trauma-focused writing and that trauma-focused writing with visual feedback did not yield more symptom reduction than trauma-focused writing without visual feedback.

RQ2a: Outcome Variation Based on Population Characteristics

Of the 11 studies in this review, two were identified to answer this research question because the demographic data was reported in a way that could be interpreted. Other studies included in this systematic review did not report findings in a way that could be grouped by age, gender, or other variables. Two studies on Chinese American breast cancer survivors best addressed RQ2 in terms of population characteristics that influence outcome variation (Chu et al., 2019; Chu, Wu, & Lu, 2020). Chu et al. (2019) looked at the level of acculturation and its effect on expressive writing. For the lowly acculturated participants, the cancer-fact and self-regulation groups showed less severe PTSD symptoms than the emotional disclosure group at 3-month and 6-month follow-up. The researchers discuss that writing about feelings related to the traumatic cancer experience has improved physical and psychological well-being in European Americans. They state that European culture places value on individualism and self-assertion while Asian culture values collectivism, group congruence, and suppressing emotions to maintain group harmony.

Chu, Wu, & Lu (2020) found that a combination of emotional disclosure and cognitive reappraisal of stressors compared to just writing facts about cancer decreased PTSD symptoms. The researchers once again note that expressive writing interventions that only focus on trauma-related emotions have been found to be more effective for White/European American individuals. Adding a cognitive reappraisal task may be an approach that is more culturally congruent to Asian cultural norms that limit emotional expression or lack of social support to cope with distressing feelings.

RQ3: Elements Influencing the Effectiveness of Writing Interventions

All studies were screened to identify which ones were best suited to answer this research question. Specifically, studies were included if the researchers explicitly stated that they

examined moderators or other predictors of outcome as a result of a writing intervention. This resulted in nine studies (Chu et al., 2019; Chu, Wu, & Lu, 2020; Gallagher et al., 2018; Possemato et al., 2011; Sloan et al. 2012; Smyth et al., 2008; Stockton et al.; 2014; Wisco et al., 2016; Zakowski et al, 2004). Elements that were reported to influence the effectiveness of writing interventions include level of acculturation (1 study), social constraints (2 studies), mood (3 studies), and type of words used (3 studies).

Acculturation

Chu et al. (2019) found that acculturation moderated the effect of expressing writing on PTSD symptoms in Chinese American breast cancer survivors. Among participants that were lowly acculturated, less severe PTSD symptoms were found in the cancer-fact and self-regulation groups versus the emotional disclosure groups at 3-month and 6-month follow-up sessions. More specifically, for the lowly acculturated participants, less severe PTSD symptoms were displayed for avoidance at the 6-month follow-up and for arousal at both the 3-month and 6-month follow-ups in the cancer-fact group versus the emotional disclosure group. No differences were found in PTSD symptoms among the highly acculturated participants. The authors note in their study that both the self-regulation and cancer-fact groups involved cognitive processing, suggesting that expressive writing protocols that involve cognitive processing are more beneficial than emotional disclosure alone for lowly acculturated Chinese American breast cancer survivors. Asian culture values collectivism and group congruence and encourages suppressing emotions while European culture values individualism and self-assertion; this is important to take into account when considering how acculturation can influence the effectiveness of writing interventions.

Social Constraints

Chu, Wu, & Lu (2020) investigated social constraints as a moderating effect. They defined social constraints as "the social conditions when individuals perceive to be misunderstood, denied, or alienated by their social partners when they attempt to disclose" (p. 892). They found that the efficacy of the writing intervention for reducing reexperiencing and hyperarousal symptoms was greater among participants with high levels of social constraints. For reducing avoidance symptoms, the efficacy of the intervention was greater for participants with low levels of social constraints. In this case, the writing intervention decreased PTSD symptoms when it utilized both written emotional disclosure and cognitive reappraisal compared to just writing facts about cancer for Chinese American breast cancer survivors.

Zakowski et al. (2004) also analyzed *social constraint*, defined as "negative social responses to patients' expressions of emotion regarding their cancer" (p. 555). It was found that patients with high levels of constraint at the time of the study's intake exhibited distress levels comparable to patients with low levels of constraint if they were given the chance to expressing their emotions through writing. Meanwhile, participants with high constraint levels who were in the control condition continued to exhibit heightened levels of distress at follow-up. Participants experiencing high levels of constraints also continued to show continued cognitive avoidance of cancer-related thoughts and stimuli at the 6-month follow-up unless they had expressed their emotions through writing.

Mood/Stress Response/Arousal

Participants in the expressive writing condition in a study by Smyth et al. (2008) reported significantly less anger and tension and trends towards less depression. When participants were exposed to trauma memories through imagery at follow-up, the expressive writing condition group showed less of a neuroendocrine stress response. The researchers noted that even though

patients are still struggling with core features of their PTSD, including re-experiencing, avoidance, and hyperarousal, their ability to regulate these responses is facilitated through expressing writing. Since dysphoric mood has been decreased in these participants following the expressive writing intervention, when they are presented with stimuli related to trauma memories, the associated physiological response is attenuated. Smyth et al. (2008) stated that this is in line with the desensitization hypothesis, "suggesting that expressive writing attenuates the positive association between trauma-related intrusive thoughts and both psychological distress and physical symptoms" (p. 92).

Sloan et al. (2012) found in a study of written exposure therapy that significant reductions in self-reported negative affect and self-reported arousal were found and facilitated by the intervention. Wisco et al. (2016) also looked at written exposure therapy and found there was an activation of the physiological fear response during the first exposure session, which was associated with treatment gains. Those individuals who showed more physiological arousal in this first exposure session also showed the largest treatment response.

Types of Words

For Chinese American breast cancer survivors in a study by Gallagher et al. (2008), the self-regulation and emotional disclosure conditions resulted in an increase in PTSD symptoms compared to the cancer facts condition. The researchers used the Linguistic Inquiry and Word Count (LIWC) software and found that women in the cancer fact condition used significantly more insight and causation words than those in the emotional disclosure condition. For this population, it was possible that focusing on negative emotions was not helpful and could have caused worse outcomes.

Meanwhile, a study by Stockton et al. (2014) found that participants who used a greater percentage of insight words experienced increases in avoidant thinking. Participants who showed an increase in use of causal words over the writing sessions experienced a reduction in the extent of posttraumatic growth reported over time. On the other hand, a declining use of causal words was associated with improvements in posttraumatic growth. The participants who used more negative emotion words in their essays experienced increases in posttraumatic growth, and participants who used a higher proportion of words reflecting insight experienced greater improvements in growth over the course of the study. Analyses utilizing the LIWC showed that using more insight words was associated with increases in posttraumatic growth. Lastly, an increased use of causal words from the first writing session to the third was associated with reductions in posttraumatic growth.

Possemato et al. (2011) utilized the Narrative Coding Systems to classify utterances and found that the total number of emotions within written emotional disclosure narratives was associated with more positive PTSD symptom change. The total number of emotions, thoughts, and physical sensations was also associated with more positive PTSD symptom change. Relatedly, participants who expressed more emotion and cognitions were significantly more likely to experience decrease PTSD symptoms. In another study on written emotional disclosure by Sloan et al. (2011), the LIWC found that participants who were assigned to WED used significantly more negative words and cognitive insight words compared to individuals in the control condition.

Chapter 4: Discussion

Overall Findings

In the 18 studies, the represented writing interventions were expressive writing, written emotional disclosure, written exposure therapy, and written imaginal exposure. Based on the studies included in this systematic review (SR), the types, characteristics, and qualities of writing interventions did not vary according to the type of trauma. Writing interventions appeared to be effective in reducing some trauma or related symptomology, with level of acculturation, social constraints, mood, and type of words used influencing their effectiveness.

All of writing protocols included in this SR focused on writing about deepest thoughts and feelings. The length of time participants spent writing, the number of writing sessions, and the time between writing sessions varied across studies. While the studies followed writing instructions previously established by these different protocols, additional instructions were also provided depending on the study and researchers. The heterogenous nature of the additional instructions provided for the writing interventions could have potentially related to differences in outcome, but this was not addressed by the studies. In all the studies, the researchers cited previous research in providing rationales for why they utilized a particular writing intervention. None of the studies reported selecting a specific writing intervention because of the type of trauma that they were studying, and not all studies had predetermined traumatic events they were interested in studying.

The main finding of this systematic review is that writing interventions are effective in decreasing some trauma and related symptoms, which is consistent with findings from past meta-analyses (i.e., Dawson et al., 2020; Gerger et al., 2021; Frisina et al., 2004; Smyth, 1998; Smyth & Pennebaker, 2008). The mean *p*-value associated with the effectiveness of writing

interventions on decreasing symptoms of trauma and related symptoms across RCTs included in RQ2 was $p < 0.16$, but this may not be meaningful as an indicator of the effectiveness of these interventions given the heterogeneity across studies in terms of population characteristics, number of writing sessions/time spent writing, severity of trauma, and types of trauma being evaluated. Furthermore, while sample sizes in the studies were determined to be justified by the author of this SR given the authors' explanations for their sample sizes, only five of 18 studies had a sample size larger than 100 participants. This presents a challenge in the detection of differences between intervention conditions in some of the studies due to resulting differences in statistical power. Compared to first-line treatments for PTSD (i.e., CPT, prolonged exposure, EMDR) the writing interventions examined in this review did not provide as many sessions and did not involve the clinician in the facilitation of processing traumatic experiences. The Department of Veterans Affairs and the Department of Defense guidelines for treating PTSD consider trauma-focused psychotherapy as "any therapy that uses cognitive, emotional, or behavioral techniques" to process a traumatic event (Department of Veterans Affairs, 2017, p. 46). While all the writing interventions in this review included instructions to engage in a form of cognitive or emotional technique for processing the trauma, therapist guidance might be needed for individuals to learn and use these techniques more effectively. Given the current evidence base on the effectiveness of writing interventions, these interventions should also be considered as adjunctive interventions rather than stand alone.

In the 11 RCTs included to answer RQ2, the method of calculating *p*-values varied across the studies, with the possibility that the effectiveness of writing interventions in decreasing trauma and other related symptoms was overestimated or underestimated. Three of the studies did not offer *p*-values related to effectiveness (Gallagher et al., 2018; Mosher et al., 2012; Sloan

et al., 2011), and in all three studies the writing intervention was not effective when compared to controls, with the control groups either reporting the same decrease in PTSD symptoms or higher decreases in PTSD symptoms. For Gallagher et al. (2018) the superior outcomes for both posttraumatic stress symptoms and posttraumatic growth in the cancer-facts condition appear to be related to values tied to emotional expression in Chinese American individuals; these are findings that were corroborated by two other studies included in this SR (Chu et al., 2019; Chu, Wu, & Lu (2020). Sloan et al. (2011) found both written emotional exposure and neutral writing to decrease PTSD symptoms from baseline to the one-month follow-up assessment. Thus, the *p*-value in this study indicates that the effectiveness of the writing intervention in reducing PTSD symptoms was not significant compared to control, but the intervention did still lead to PTSD symptom reduction. Given these findings, first-line treatments for PTSD should be utilized when available as these treatments have been tested in numerous clinical trials. Narrative Exposure Therapy (NET) and written narrative exposure are also recommended due to having sufficient evidence (Department of Veterans Affairs, 2017, pp. 46). Other writing interventions should continue to be evaluated through clinical trials and might be beneficial to use with individuals who are unable to engage in first-line trauma-focused psychotherapy as a first option.

Generalizing the results of the presented RCTs is difficult given that the writing interventions were administered to samples that disproportionately self-identified as female and White. Seven out of the 11 identified RCTs focused on the effectiveness of expressive writing, making it difficult to generalize the effectiveness of writing interventions given the lack of writing intervention variability. The results from the RCTs also derived from a great deal of heterogeneity: large ranges of sample sizes, a variety of different measures, and inconsistent reporting of *p*-values and effect sizes. Only five of 18 studies had a sample size larger than 100

participants. Of 13 studies with a sample smaller than 100 participants, two studies did not report statistical power (Aldridge & Range, 2005; Mosher et al., 2012), seven studies had sufficient power to detect differences of small magnitude (Chu et al., 2019; Gallagher at al., 2018; Mosher at al., 2012; Sloan et al., 2011, 2012; Stockton et al., 2014; Truijens & van Emmerik, 2014), and four studies had low/inadequate statistical power (Honos-Webb et al., 2006; Koopman et al., 2005; Possemato et al., 2011; Wisco et al., 2016). The small sample size and low power in these four studies makes it challenging to detect statistically significant findings and can explain limitations in finding effectiveness for some of the writing interventions. Three of the studies also did not report information on whether the measures used were reliable and valid.

Only two studies focused on population characteristics that could influence outcome variation of writing interventions, and both studies were on Chinese American breast cancer survivors (Chu et al., 2019; Chu, Wu, Lu, 2020). While both studies indicated that there are differences in values of White/European American cultures/populations versus Asian cultures, which affected the effectiveness of the writing intervention, the rest of the studies included in this SR did not focus on whether culture affected writing interventions effectiveness. The studies provide a compelling argument that is backed by the findings for the importance of cultural adaption in psychosocial interventions specifically for individuals who come from Asian cultures. Both studies commented on how Asian culture values collectivism, group congruence, and suppressing emotions to maintain group harmony. The existing research on writing interventions that focus only on trauma-related emotions have been found to be more effective for White/European American individuals. It is important to note that Hispanic/Latino individuals also come from a collectivistic culture (Centers for Disease Control and Prevention, n.d.). This population was part of many samples from the included studies, and it is possible that

differences in culture could have also affected the benefits this group gained from engaging in writing about trauma-related emotions.

Given the findings of Chu et al. (2019) that acculturation moderates the effect of expressive writing and the findings of Chu, Wu, & Lu (2020) that a combination of written emotional disclosure and cognitive reappraisal of stressors decreased PTSD symptoms in Chinese American breast cancer survivors, the field could focus more on research on how to make writing interventions culturally informed. While these are considerations that need to be made in treatment by a therapist based on APA's Multicultural guidelines, all the writing interventions reviewed are stand alone and do not require a therapist. Writing interventions have the potential to be useful if they can be implemented with individuals when treatment isn't readily available due to wait times or due to hesitancy on part of the individual to initiate treatment. To make these writing protocols useful, more information is needed on how to make them culturally informed, as the current evidence base is limited.

Different elements that may impact the effectiveness of writing interventions for trauma were found through the studies, including level of acculturation, social constraints, mood, and type of words used. Not all included studies examined and reported moderators and other elements that influenced intervention effectiveness and therefore there are likely additional elements that are not examined in this review. Three of the studies focused on acculturation and social constraints as moderators. It was found that acculturation moderates the effect of expressive writing among lowly acculturated Chinese American breast cancer survivors (Chu et al., 2019). Chu, Wu, and Lu (2020) found that the intervention efficacy for reducing reexperiencing and hyperarousal symptoms was greater among those with high levels of social constraints while the intervention efficacy for reducing avoidance symptoms was greater among

those with low levels of social constraints. Lastly, results by Zakowski et al. (2004) showed that written disclosure buffered the effects of social constraints on distress such that patients with high levels of constraint at study intake exhibited distress levels comparable to patients with low levels of constraint if they were given the opportunity to express their emotions in writing. For these moderators to be better understood with confidence, multiple studies would need to replicate the same significant findings, which was not observed in this SR. Gaining a better understanding of the mechanisms that influence the effectiveness of various writing interventions can help make these interventions more helpful.

These results relating to the different elements that were found to impact the effectiveness of writing interventions provide a potential explanation as to why writing interventions may not be effective for everyone. While protocols like CPT and PE also provide processing of thoughts and feelings related to a traumatic event, a therapist guides clients through this protocol to ensure that clients are engaging in the processing of the traumatic event instead of avoiding. It has been found that individuals who are highly reliant on avoidant coping strategies may be at greatest risk of maintaining or increasing their PTSD symptoms (Pineles et al., 2011). When individuals are engaging in writing interventions as a stand-alone intervention, it might not be entirely clear if they are fully engaging in the processing of the trauma through cognitive, emotional, or behavioral techniques. On the other hand, a therapist can clearly monitor for avoidant coping strategies during treatment utilizing trauma-focused psychotherapy. For example, individuals using the writing intervention may not be exposing themselves to the traumatic memory enough to decrease neuroendocrine stress response, activate the physiological fear response, and utilize insight/causal words.

For cultural groups who value group congruence, the nature of the writing intervention itself and engaging in the processing of thoughts and emotions may be incongruent with their view on suppressing emotions to maintain harmony (Chu et al., 2019). In this case, it may be more appropriate to focus on exploring thoughts related to the trauma versus only focusing on emotions. The elements that were found to influence writing intervention effectiveness can be closely monitored, targeted, and modified in treatment with a therapist; this is not possible when individuals are simply given instructions to write about their trauma without feedback or follow-up.

Strengths and Limitations

One strength of this review is the inclusion of various writing interventions and quantitative research designs, which resulted in a diverse sample of studies. The studies included in this SR had a range of sample sizes, treatment modalities, and demographic characteristics, which increased the generalizability of findings. Concurrently, a limitation of generalizability of findings presented itself in relatively few participants in the studies being male. This might partially be due to some of the studies focusing on issues related to being female (breast cancer, pregnancy) and because PTSD is more common in women than men (National Institute of Mental Health, n.d.). Men are also less inclined to seek treatment for psychological issues compared to women (Liddon et al., 2018). Research also suggests that while women express more internalizing symptoms (e.g., withdrawing, depression) men tend to express more externalizing symptoms (e.g., substance use). This could potentially affect the diagnosis given and problems determined to be more significant to target first. These are some factors that could account for the disproportionate representation of women in the studies. Moreover, there is a limitation of generalizability when it comes to combat veterans. The lack of studies on combat

PTSD included in this review may in part be due to the eligibility criteria. Given that the U.S. Department of Veterans Affairs is a large healthcare system in the U.S., it is important to note that there is a limitation in this SR providing sufficient information on the effectiveness of writing interventions for this population.

Another limitation of this SR is related to the difficulty of replicating the narrative synthesis process. Part of this difficulty has to do with the need for guidance to inform the development of clear and concise reporting guidelines for narrative synthesis (Campbell et al., 2019). Campbell et al. (2019) have also found that a lack of transparency when reporting narrative synthesis can potentially lead to bias, which can threaten the replicability of the method.

Directions for Future Research

In the initial preliminary search of the literature to determine the best methodology for the topic of interest in this SR, it became evident that there is a lack of qualitative studies done on writing interventions for treating trauma. Future studies could examine more qualitatively what individuals report about writing interventions and its effectiveness. More specifically, research should concentrate on what elements of writing interventions individuals find useful and determine whether any patterns emerge on the reported qualitative experiences. Since quantitative studies point to some effectiveness of stand-alone writing interventions, it can be helpful to understand which elements are helpful based on this participant self-report. Qualitative analyses of narratives could also provide additional information on emerging themes that can describe the kind of content that contributes to significant PTSD symptom reduction. This would also provide information on whether participants are following instructions they are given for the written assignment and how to potentially modify given instructions. Research should also focus

on evaluating the effectiveness of writing interventions in more diverse cultural groups. It would be interesting to see research continued to be conducted with Chinese American individuals as well as with other cultural groups that value group congruence and harmony. This would provide valuable information on how writing interventions may need to be modified to be more culturally sensitive and effective. Lastly, future research should focus on recruiting more male participants given that the included studies included predominantly self-identified female participants. In a study, it was found that male patients had better outcome in interpretive therapy than in supportive therapy, while female patients had better outcome in supportive therapy (Ogrodniczuk et al., 2001). Interpretive therapies place emphasis on insight into repetitive conflicts and traumas underlying a patient's problems. This suggests that male responses to writing interventions could be different from those of females.

Clinical Implications and Conclusions

Based on the data examined in this SR, stand-alone writing interventions may provide an alternative that could be effective for individuals that cannot engage in longer-term treatment and/or have reservations about starting therapy.

Using writing interventions to treat trauma could make trauma treatment more widely available as these interventions do not necessarily have to be administered by psychologists. The writing intervention protocols that were part of this SR do not include any specific interventions that require a psychologist. Psychoeducation about PTSD symptoms in protocols like written exposure therapy can also be provided by non-psychologists as it could include reading psychoeducational information from handouts. This allows delivery of the intervention with minimal to no training. This could help with providing more widespread treatment and possibly also providing early intervention given that individuals might not have to be placed on a waitlist

to receive treatment or could start processing their trauma(s) while waiting for a psychologist. Some of the studies administered these interventions online and even at the comfort of the individuals' home so this can make it easy to administer the assessments and the writing intervention itself. It is possible that the opportunity to complete the writing assignment online and/or at home could increase desirability and commitment to engaging in the intervention. The flexibility in the implementation of writing interventions can make this treatment something that is more widely available to individuals who need it and might benefit from it.

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APPENDIX A

List of Search Terms

List of Search Terms

LIST OF SEARCH TERMS

*Each Primary Search Term can have synonyms or alternate forms to use with the "OR" operator in your searches

Search Term ID#	Primary Term	Synonyms/ Alternate Forms	Notes
01	Trauma	"stress," "traumatic stress," "PTSD," "posttraumatic stress," "posttraumatic stress disorder," "postraumatic growth"	
02	Writing	"writing intervention," "expressive writing," "emotional disclosure," "writing therapy," "narrative writing," "narrative," "written discloure "	
03	Quantitative Study/Research	empirical study" OR "empirical research" OR "treatment study" OR "treatment research" OR "outcome study" OR "outcome research" OR "efficacy study" OR "efficacy research" OR "effectiveness study" OR "effectiveness research"	

APPENDIX B

Search Plan

Search Plan

COMPREHENSIVE SEARCH PLAN

*Includes Electronic databases, registries, journal TOCs, Reference lists from articles/books, resource lists from organizations, etc. etc. etc.

Search Type	Databases or Sources	Search Term ID(s)	Search Syntax or Instructions	Fields to Search	Specifiers
Electronic Database	PsycINFO	01, 02	("trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress OR "posttraumatic stress disorder" OR "posttraumatic growth") AND ("writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "narrative writing" OR "narrative" OR "writing disclouре"	Title, Keywords, Abstract	*Years: 2000-2020 *Type: Peer-reviewed articles only, Quantitative studies only
Electronic Database	Scopus	01, 02, 03	("trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress OR "posttraumatic stress disorder" OR "posttraumatic growth") AND ("writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "narrative writing" OR "narrative" OR "writing disclosure" AND "study" OR "quantitative study," OR " empirical study" OR "empirical research" OR "treatment study" OR "treatment research" OR "outcome study" OR "outcome research" OR "efficacy study" OR "efficacy research" OR "effectiveness study" OR "effectiveness research"	Title, Keywords, Abstract	*Years: 2000-2020
Electronic Database	EBSCO (Alt Health Watch)	01, 02	("trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress OR "posttraumatic stress disorder" OR "posttraumatic growth") AND ("writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "narrative writing" OR "narrative" OR "writing disclosure"	Title, Keywords, Abstract	*Years: 2000-2020 *Type: Peer-reviewed articles only, Academic Journal
Electronic Database	ProQuest (PTSDpubs)	01, 02, 03	("trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress OR "posttraumatic stress disorder" OR "posttraumatic growth") AND ("writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "narrative writing" OR "narrative" OR "writing disclosure" AND "study" OR "quantitative study," OR " empirical study" OR "empirical research" OR "treatment study" OR "treatment research" OR "outcome study" OR "outcome research" OR "efficacy study" OR "efficacy research" OR "effectiveness study" OR "effectiveness research"	Title, Keywords, Abstract	*Years: 2000-2020 *Type: Peer-reviewed articles only, Journal Articles only, English language only
Electronic Database	PubMed	01, 02, 03	("trauma" OR "stress" OR "traumatic stress" OR "PTSD" OR "posttraumatic stress OR "posttraumatic stress disorder" OR "posttraumatic growth") AND ("writing" OR "writing intervention" OR "expressive writing" OR "emotional disclosure" OR "writing therapy" OR "narrative writing" OR "narrative" OR "writing disclosure" AND "study" OR "quantitative study," OR " empirical study" OR "empirical research" OR "treatment study" OR "treatment research" OR "outcome study" OR "outcome research" OR "efficacy study" OR "efficacy research" OR "effectiveness study" OR "effectiveness research"	Title, Keywords, Abstract	Years: 2000-2020 *Type: Journal Articles only, English language only, Adults only

APPENDIX C

Search Documentation Record

Search Documentation Record

TYPE OF SEARCH	DATABASE/SOURCE	SEARCH TERM ID#s	SEARCH SYNTAX OR OTHER GUIDELINES FOR THE SEARCH	FIELDS SEARCHED	SEARCH SPECIFIER: Years	SEARCH SPECIFIER: Publication Type	(Columns for Other Specifiers as Needed)	# of Records	NOTES
Electronic Database	PsycINFO	01, 02	"trauma" or "stress" or "traumatic stress" or "PTSD" or "posttraumatic stress" or "posttraumatic stress disorder" or "posttraumatic growth" AND "writing" or "writing intervention" or "expressive writing" or "emotional disclosure" or "writing therapy" or "narrative writing" or "narrative" or "writing disclosure"	Title, Keywords, Abstract	2000-2021	Peer reviewed, quantitative studies		1,548	10 duplicates detected, 4 duplicates found (1
Electronic Database	Scopus	01, 02, 03	(trauma) OR (stress) OR (traumatic stress) OR (PTSD) OR (posttraumatic stress) OR (posttraumatic stress disorder) OR (posttraumatic growth) AND (writing) OR (writing intervention) OR (expressive writing) OR (emotional disclosure) OR (writing therapy) OR (narrative writing) OR (narrative) OR (writing disclosure) AND "study*" OR "quantitative study*" OR "empirical study*" OR "empirical research*" OR "treatment study*" OR "treatment research*" OR "outcome study*" OR "outcome research*" OR "efficacy study*" OR "efficacy research*" OR "effectiveness study*" OR "effectiveness research*"	Title, Keywords, Abstract	2000-2021	Limit to: Article	Limit to: Psychology; Limit to: English; Limit t	533	Tried quotations (for approximate loose phra
Electronic Database	EBSCO (Alt Health Wa	01, 02, 03	"trauma" or "stress" or "traumatic stress" or "PTSD" or "posttraumatic stress" or "posttraumatic stress disorder" or "posttraumatic growth" AND "writing" or "writing intervention" or "expressive writing" or "emotional disclosure" or "writing therapy" or "narrative writing" or "narrative" or "writing disclosure" AND "study" OR "quantitative study" OR "empirical study" OR "empirical research" OR "treatment study" OR "treatment research" OR "outcome study" OR "outcome research" OR "efficacy study" OR "efficacy research" OR "effectiveness study" OR "effectiveness research"	Abstract	2000-2021	Peer-reviews articles, Publication type: Academic Journal, Document type: Article,		7	Searched "all text" but too many results (1,2
Electronic Database	ProQuest (PTSDpubs)	01, 02, 03	trauma or stress or traumatic stress or PTSD or posttraumatic stress or posttraumatic stress disorder or posttraumatic growth AND writing or writing intervention or expressive writing or emotional disclosure or writing therapy or narrative writing or narrative or writing disclosure AND study OR quantitative study OR empirical study OR empirical research OR treatment study OR treatment research OR outcome study OR outcome research OR efficacy study OR efficacy research OR effectiveness study OR effectiveness research	Anywhere	2000-2021	Peer-reviewed; Source type: Journal Articles; Language: English		603	Searched "anywhere" and without any quota
Electronic Database	PubMed	01, 02, 03	"trauma"[Title/Abstract] OR "stress"[Title/Abstract] OR "traumatic stress"[Title/Abstract] OR "PTSD"[Title/Abstract] OR "posttraumatic stress"[Title/Abstract] OR "posttraumatic stress disorder"[Title/Abstract] OR "posttraumatic growth"[Title/Abstract]) AND ("writing"[Title/Abstract] OR "writing intervention"[Title/Abstract] OR "expressive writing"[Title/Abstract] OR "emotional disclosure"[Title/Abstract] OR "writing therapy"[Title/Abstract])) AND (study[Title/Abstract] OR quantitative study[Title/Abstract] OR empirical study[Title/Abstract] OR empirical research[Title/Abstract] OR treatment study[Title/Abstract] OR treatment research[Title/Abstract] OR outcome study[Title/Abstract] OR outcome research[Title/Abstract] OR efficacy study[Title/Abstract] OR efficacy research[Title/Abstract] OR effectiveness study[Title/Abstract] OR effectiveness research[Title/Abstract]	Title/Abstract	2000-2021	Article Type: Clinical Trial, Randomize	Language: English; Age: Adult 19+ Years	83	Searching for the key terms in "all fields" res

APPENDIX D

Screening and Selection Record

Screening and Selection Record

SCREENING AND SELECTION RECORD

PHASE 1: Title/Keywords/Abstract (Screening) PHASE 2: Full-Text Review (Eligibility) PHASE 3: Final Decision (Selection)

DECISION CODES: INCLUDE/CONTINUE TO ABSTRACT/CONTINUE TO FULL TEXT/UNDECIDED/EXCLUDE (IN/CAB/CFT/UN/EX)

CRITERIA CODES: (IS THE CRITERIA MET?) YES/UNCLEAR/NO (Y/UC/N)

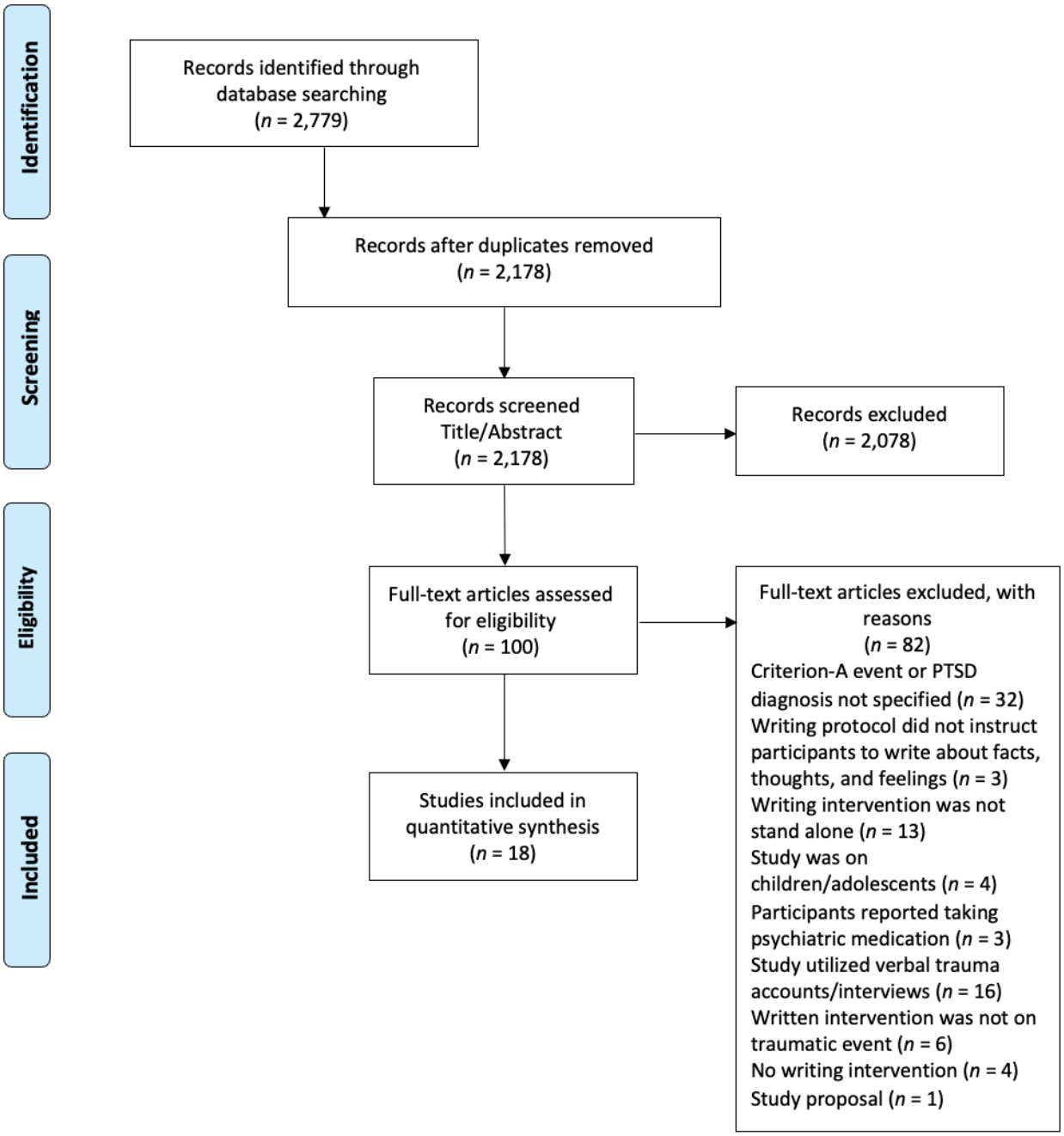
	YEAR	ABBREVIATED TITLE	DATABASES/ SOURCES	TITLE AND/OR KEYWORD SCREEN: DECISION - DATE	ABSTRACT SCREEN: DECISION - DATE	FULL-TEXT SCREEN?	INCL (SO): *Published Study*	INCL(RV): *Writing Interventions (stand alone, written by patient, about trauma)*	INCL(RV): Criterion-A event trauma or PTSD diagnosis
Krupnick et al.	2017	An internet-based writing intervention for PTSD in veterans	PsycInfo	IN 10/2/2022 -VP		Y	Y	N - not stand alone	
Chaput et al.	2008	Glycemic instability and spontaneous energy intake	PsycInfo	EX 10/02/2022 -MM					
Toyoshima et al.	2011	Piano playing reduces stress more than other creative art acticities	PsycInfo	EX 10/02/2022 -VP					
Ames et al.	2005	Expressive Writing interventions for yougn adult cigerette smokers	PsycInfo	CAB 10/2/2022 -VP	EX 10/2/2022 -VP				
Kelly et al.	2012	Encouraging acceptabce of ambivalence using the expressive wriring paradig	PsycInfo	CAB 10/2/2022 -VP	EX 10/2/2022 -VP				

INCL (RV): Traumatic Event/Trauma Symptoms/Related symptoms measured	INCL (M): Quantitative	EXCL: Studies with children and adults, adult data cannot be extracted by itself	EXCL: Subjects taking psychiatric medication (if reported)	REVIEWER DECISION - DATE	SECONDARY/ CONFIRMATORY DECISION	FINAL DECISION	FINAL DECISION DATE	
Y	Y	N/A	Y - 8 subjects rep	10/02/2022	EXCLUDE-MM	EXCLUDE-MM	12/19/2022	Article content relevant to dissertation topic; writing intervention
				10/02/2022		EXCLUDE	10/02/2022	Article content irrelevant to dissertation topic
				10/02/2022		EXCLUDE	10/02/2022	Article content irrelevant to dissertation topic
				10/02/2022		EXCLUDE	10/2/2022	Article content irrelevant to dissertation topic - includes writing in
				10/02/2022		EXCLUDE	10/2/2022	Article content irrelevant to dissertation topic - includes writing in

APPENDIX E

PRISMA Flow Diagram

PRISMA Flow Diagram



APPENDIX F

Data Extraction Form

Data Extraction Form

Document ID#

Authors and Year *(last names of authors and year of publication, e.g., Johnson, Jones, and*

Full Document Title

Research Variables

Notes:

1. General Information

1. **Date form completed** ***(dd/mm/yyyy)***	
2. **Initials/ID of person extracting data**	
3. **Source/Publication Type** *(journal, book, conference, report, dissertation, abstract, etc.)*	
4. **Source Name** *(Title of Journal, Book, Organization, etc.)*	
5. **Publication Status** *(Published, Unpublished)*	
6. **Document Language**	
7. **OTHER:**	
8. **Notes:**	

2. Design Characteristics and Methodological Features

	Descriptions as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
9. **Aim of study**		
10. **General Method** (Quant, Qual, Mixed)		
11. **Type of Quantitative Design or Study**		
12. **Type of Quantitative Study**		
13. **Notes:**		

3. Assessment of Research Variables

RESEARCH VARIABLES	**Operationalized Variable**	**How Assessed** *(Measure, Observation, Interview Question, Archival, etc.)*	**Reliability/Validity/Utility**	**Location in text** *(pg & ¶/fig/table)*
14. **Trauma Exposure**				
15. **Symptoms of trauma**				
16. **Measure of other outcomes**				
17. **Notes:**				

4. Study Participant Characteristics and Recruitment

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
18. **Population of Interest**		
19. **Other Participant Characteristics**		
20. **Recruitment Methods**		
21. **Sample Size**		
22. **Age**		
23. **Gender**		
24. **Race/Ethnicity**		
25. **Severity of Trauma**		
26. **Notes:**		

5. Setting Characteristics

	Descriptions as as stated in report/paper	Location in text *(pg & ¶/fig/table)*
27. **Study Geographic Location**		
28. **Data Collection Setting(s)**		
29. **Study Setting**		
30. **Notes:**		

6. Characteristics of the Writing Intervention

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
31. **Number of sessions**		
32. **Frequency of sessions**		
33. **Setting of intervention**		
34. **Individual(s) conducting intervention**		
35. **Focus of Intervention (Group, Individual)**		
36. **Type of intervention (EWP, journaling, etc.)**		
37. **Nature of writing intervention (stand alone writing or as part of therapy or adjunctive to therapy)**		
38. **Description of intervention**		
39. **Notes:**		

7. Analyses Conducted

	Description as stated in report/paper	Location in text (pg & ¶/fig/table)
40. **Power size**		
41. **Effect size**		

	Description as stated in report/paper	Location in text (pg & ¶/fig/table)
42. **Writing intervention results**		
43. **Statistical methods used**		
44. **Notes:**		

8. Results

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
45. **Key Result #1**		
46. **Key Result #2**		
47. **Key Result #3**		
48. **Key Result #4**		
49. **Key Result #5**		
50. **Key Result #6**		
51. **Key Result #7**		
52. **Key Result #8**		
53. **Notes:**		

9. Conclusions and Follow-up

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
54. **Key conclusions of study authors**		
55. **Study Author's Recommendations for Future Research**		
56. **Your Take-Aways: General**		
57. **Your Take-Aways: Implications for Practice**		
58. **Salient Study Limitations (to inform Quality Appraisal**		
59. **Notes:**		

APPENDIX G

Quality Appraisal Form

Quality Appraisal Form

Critical Review Form – Quantitative Studies
©Law, M., Stewart, D., Pollock, N., Letts, L. Bosch, J., & Westmorland, M.
McMaster University
- Adapted Word Version Used with Permission –

The EB Group would like to thank Dr. Craig Scanlan, University of Medicine and Dentistry of NJ, for providing this Word version of the quantitative review form.

Instructions: Use tab or arrow keys to move between fields, mouse or spacebar to check/uncheck boxes.

CITATION	Provide the full citation for this article in APA format:
STUDY PURPOSE Was the purpose stated clearly? ☐ Yes ☐ No	Outline the purpose of the study. How does the study apply to your research question?
LITERATURE Was relevant background literature reviewed? ☐ Yes ☐ No	Describe the justification of the need for this study:
DESIGN ☐ Randomized (RCT) ☐ cohort ☐ single case design ☐ before and after ☐ case-control ☐ cross-sectional ☐ case study	Describe the study design. Was the design appropriate for the study question? (e.g., for knowledge level about this issue, outcomes, ethical issues, etc.): Specify any biases that may have been operating and the direction of their influence on the results:
SAMPLE N = Was the sample described in detail? ☐ Yes ☐ No Was sample size justified? ☐ Yes ☐ No ☐ N/A	Sampling (who; characteristics; how many; how was sampling done?) If more than one group, was there similarity between the groups?: Describe ethics procedures. Was informed consent obtained?:

<table>
<tr><td rowspan="2">OUTCOMES

Were the outcome measures reliable?
☐ Yes
☐ No
☐ Not addressed

Were the outcome measures valid?
☐ Yes
☐ No
☐ Not addressed</td><td colspan="2">Specify the frequency of outcome measurement (i.e., pre, post, follow-up):</td></tr>
<tr><td>Outcome areas:</td><td>List measures used.:</td></tr>
<tr><td>INTERVENTION

Intervention was described in detail?
☐ Yes
☐ No
☐ Not addressed

Contamination was avoided?
☐ Yes
☐ No
☐ Not addressed
☐ N/A

Cointervention was avoided?
☐ Yes
☐ No
☐ Not addressed
☐ N/A</td><td colspan="2">Provide a short description of the intervention (focus, who delivered it, how often, setting). Could the intervention be replicated in practice?</td></tr>
<tr><td>RESULTS

Results were reported in terms of statistical significance?
☐ Yes
☐ No
☐ N/A
☐ Not addressed

Were the analysis method(s) appropriate?
☐ Yes
☐ No
☐ Not addressed</td><td colspan="2">What were the results? Were they statistically significant (i.e., $p < 0.05$)? If not statistically significant, was study big enough to show an important difference if it should occur? If there were multiple outcomes, was that taken into account for the statistical analysis?</td></tr>
</table>

Clinical importance was reported? ☐ Yes ☐ No ☐ Not addressed	What was the clinical importance of the results? Were differences between groups clinically meaningful? (if applicable)
Drop-outs were reported? ☐ Yes ☐ No	Did any participants drop out from the study? Why? (Were reasons given and were drop-outs handled appropriately?)
CONCLUSIONS AND IMPLICATIONS Conclusions were appropriate given study methods and results ☐ Yes ☐ No	What did the study conclude? What are the implications of these results for practice? What were the main limitations or biases in the study?

APPENDIX H

Tables

Table H1

Quality Appraisal

Study	Study Purpose (clearly stated?)	Relevant Literature Reviewed	Appropriate Design (for study question)	Sample size described/justified	Outcome measures reliable and valid?	Intervention (described in detail, contamination/cointervention avoided)	Results: (appropriate analysis?)	Statistical significance/clinical importance reported	Drop-outs reported?	Appropriate Conclusions
Paquin et al. (2021)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Stockton et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sloan et al. (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Possemato et al. (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wisco et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Chu et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Chu et al. (2020a)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Chu et al. (2020b)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Zakowski et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Honos-Webb et al. (2006)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Truijens & van Emmerik (2014)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sloan et al. (2011)	Y	Y	Y	Y	Not addressed	Y	Y	Y	Y	Y
Aldridge & Range (2005)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Smyth et al. (2008)	Y	Y	Y	Y	Not addressed	Y	Y	Y	Y	Y
Gallagher et al. (2018)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Mosher et al. (2012)	Y	Y	Y	Y	Not addressed	Y	Y	Y	Y	Y
Koopman et al. (2005)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Craft et al. (2012)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table H2

Characteristics of Included Studies – Writing Intervention and Participant Information (Chronological Order)

Authors	Population Characteristics	Type of Trauma	Type of Writing Intervention	Writing Intervention Characteristics	Control/Comparison Groups	Outcome Measures	Results/Main Findings
Aldridge & Range (2005)	85 undergraduate students (72 women, 13 men)	Childhood sexual abuse/physical abuse	Expressive writing	4 consecutive sessions, 20 minutes each Participants were asked to write about their deepest thoughts and feelings about a time in their childhood that they were harmed physically or sexually by a parent, guardian, or family member over 18 years of age	Positive condition and trivial condition	Positive and Negative Affect Scale; Self-Rating Depression Scale; State-Trait Anxiety Inventory, State Form	Participants reported more depression, $F(2, 71) = 8.13$, $p < .000$ at pretest compared to posttest and follow-up. Participants reported more anxiety at pretest and follow-up test, compared to posttest, $F(2,70) = 4.12$, $p = .02$.
Chu, Wong, & Lu (2019)	96 female Chinese American breast cancer survivors (from local communities in the USA) Mean Age = 54.54	Serious illness or injury (breast cancer)	Expressive writing	Once a week for three consecutive weeks, writing continuously for up to 30 minutes or until one page of essay completed Emotional disclosure group: deepest thoughts and feelings related to their cancer for 3 weeks; Self-regulation group: deepest thoughts and feelings in Week 1, their most stressful experience and coping strategies in Week 2, and the positive thoughts and feelings they experienced since cancer diagnoses in Week 3; Cancer-fact group: wrote about the details of their cancer diagnosis and treatment experience objectively for 3 weeks	Self-regulation group, emotional disclosure group, cancer-facts group	PTSD Symptom Scale—Self report (three subscales: re-experiencing, avoidance, and arousal); The Stephenson Multigroup Acculturation Scale—Dominant Society Immersion Scale	Among lowly acculturated participants, the cancer-fact and self-regulation groups showed less severe PTSD symptoms than the emotional disclosure group at the 3-month and 6-month follow-up sessions.

Authors	Population Characteristics	Type of Trauma	Type of Writing Intervention	Writing Intervention Characteristics	Control/Comparison Groups	Outcome Measures	Results/Main Findings
Chu, Wu, & Lu (2020a)	136 Chinese American breast cancer survivors (recruited from communities in the Los Angeles, New York, and Houston metropolitan areas Between 34 and 84 years old (M = 57.75)	Medical trauma (breast cancer)	Expressive writing	Once a week for three consecutive weeks, writing continuously for up to 30 minutes or until one page of essay was completed Self-regulation group: write about their innermost thoughts and feelings about cancer (week 1), the positive and negative consequences of the stressful cancer experience and an evaluation of their coping strategies (week 2), and positive thoughts about cancer (week 3); Enhanced self-regulation group: received the same instructions, except that the order was switched between week 1 and week 2; Cancer-fact group: write about their cancer diagnosis and treatment experience objectively for 3 weeks.	Self-regulation group, enhanced self-regulation group, and cancer-facts group	Social constraints scale; 17-item PTSD symptom scale—self-report (three subscales: reexperiencing, avoidance, and hyperarousal	After the intervention, PTSD symptoms were less severe in both the self-regulation and the enhanced self-regulation groups than in the cancer-fact group, and the intervention efficacy for reducing reexperiencing and hyperarousal symptoms was greater among those with high levels of social constraints. In contrast, the intervention efficacy for reducing avoidance symptoms was greater among those with low levels of social constraints.
Chu, Wu, Tang, Tsoh, & Lu (2020b)	136 Chinese American breast cancer survivors (recruited from communities in the Los Angeles, New York, and Houston metropolitan areas Between 34 and 84 years old (M = 57.75)	Serious illness or injury (breast cancer)	Expressive writing	See above study (Chu et al., 2020a) for description	Self-regulation group, enhanced self-regulation group, and cancer-facts group	PTSD Symptom Scale—Self Report	Hyperarousal predicted the subsequent severity of reexperiencing and avoidance symptoms from baseline to 1-month, 1-month to 3-month, and 3-month to 6-month follow-ups.

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Craft, Davis, & Paulson (2012)	120 early breast cancer survivors	Serious illness or injury (breast cancer)	Expressive writing	20 minutes a day for 4 consecutive days Breast cancer trauma group: write about deepest thoughts and feelings regarding breast cancer; Self-selected trauma group: write about deepest thoughts and feelings regarding any trauma; Facts related to breast cancer group: write about facts only, no feelings (e.g. diet, exercise, sleep, and medication) about breast cancer experience	Control group (no writing) or one of three expressive writing groups: breast cancer trauma, any self-selected trauma, and facts related to breast cancer	Functional Assessment of Cancer Therapy-Breast Cancer Version (quality-of-life)	Expressive writing about one's breast cancer, breast cancer trauma and facts related to breast cancer, significantly improved the quality-of-life outcome.

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Gallagher, Long, Tsai, Stanton, & Lu (2018)	96 female Chinese American breast cancer survivors (recruited from communities in the Los Angeles, New York, and Houston metropolitan areas) Age range = 37 to 77 years old; Mean Age = 54.54, all foreign born	Serious illness or injury (breast cancer)	Expressive writing	Once a week for three consecutive weeks, writing continuously for up to 30 minutes or until one page of essay was completed Cancer facts condition: objectively write about their cancer diagnosis and treatment in a detailed manner; Emotional disclosure condition: write about deepest thoughts and feelings about their cancer experiences; Self-regulation condition: write about their deepest thoughts and feelings related to their cancer experience during week one, the coping strategies they used to deal with stressors caused by their cancer experience during week two, and positive thoughts and feelings regarding their cancer experience during week three	Self-regulation group, emotional disclosure group, cancer-facts group	The Posttraumatic Growth Inventory; The PTSD Symptom Scale—Self-Report	Results indicated that there was generally a small increase in PTSS (ESsg = .16) and a small decrease in PTG (ESsg = −.16) from baseline to the 6-month follow-up. Effect size comparisons and latent growth curve models also indicated that the cancer facts condition was generally associated with superior out-comes for both PTSS and PTG.

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Honos-Webb, Suwolf, Hart, & Scalise (2006)	69 participants; 58 were female (84) and the average age was 18.9 (*SD* = 2.3) Sixty-three percent of participants were Caucasian, 15% Asian American, 12% Hispanic, 3% African American, and 7% other	Terrorist attacks (9/11)	Expressive writing	Same time for 4 consecutive days, 20 minutes Writing condition: write about feelings regarding the terrorist attacks against the United States on September 11, 2001 and the United States' attacks against Afghanistan that started on October 7, 2001; Story listening condition: three separate stories (one 12 minutes long, the other two about 4-5 min) told by the same teller	Expressive writing or story listening condition	PTSD Checklist; Impact of Events Scale	Participants in both conditions reported significant improvements in trauma symptoms on the final day of each condition. Therefore, there were no significant differential treatment effects.
Koopman, Ismailji, Holmes, Classen, Palesh, & Wales (2005)	47 women in the San Francisco Bay Area of California Ages ranged from 21-56 years (mean = 36.5) Participants' ethnic backgrounds: White/European American (68%), Latina/Hispanic (13%), Middle Eastern (6%), African American (6%), Asian American (2%) and other (4%)	Intimate partner violence	Expressive writing	4 writing sessions scheduled at weekly intervals, 20 minutes each Expressive writing: explore deepest emotions and feelings about the most traumatic experience of their life; Neutral writing: write about how they used their time, with no interest in emotions or opinions	Expressive writing or neutral writing	Bodily Pain Scale of the SF-36 Health Survey; Beck Depression Inventory; PTSD Checklist—Specific Version	Main effects were not significant for changes in depression, pain or PTSD symptoms. However, among Depressed women, those assigned to expressive writing showed a significantly greater drop in depression.

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Mosher, DuHamel, Lam, Dickler, Li, Massie, & Norton (2012)	87 women with metastatic breast cancer	Serious illness or injury (breast cancer)	Expressive writing	Four writing sessions over 4-7 weeks, 20 minutes each Expressive writing: deepest thoughts and feelings regarding their cancer; Neutral writing: describe yesterday's activities in a factual manner	Expressive writing or neutral writing	The Meaning/Peace subscale of the Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being scale; Center for Epidemiologic Studies – Depression scale; anxiety subscale of the Hospital Anxiety and Depression Scale; The Pittsburgh Sleep Quality Index; The Functional Assessment of Chronic Illness Therapy Fatigue subscale	No statistically significant group differences in existential and psychological well-being, fatigue and sleep quality were found at 8-weeks post-writing. However, the expressive writing group reported significantly greater use of mental health services during the study than the neutral writing group (55% vs. 26%, respectively; p5 0.05).
Paquin, Bick, Lipschutz, Elgbeili, Laplante, Biekman, King, & Olson (2021)	1090 women, ages 18-45 residing in the greater Houston area, and who were pregnant at the time of, or who conceived within 6 months of, Hurricane Harvey's landfall	Natural disaster (Hurricane Harvey)	Expressive writing	Four daily sessions, 15 minutes each Expressive writing group: write about their worst fears related to the flood (day 1), about whether the flood had caused any change in their personal relationships (day 2), about the most traumatic experience of their lifetime (day 3), and about their lifetime or current worst conflicts or problems (day 4); Neutral writing group: write about exercising habits and goals (day 1), eating habits day 2), general health and health history (day 3), and work (day 4)	Expressive writing, neutral writing, or no writing	Impact of Event Scale—Revised; Inventory of Depression and Anxiety scales	Expressive writing produced greater feelings of anxiety and sadness during the intervention compared to neutral writing; further, overall experiences from the intervention mediated associations between expressive writing and greater post-traumatic stress at 2 months post-intervention.

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Possemato, Ouimette, & Knowlton (2011)	31 veterans, primary care patients at two VA facilities The participants were predominately male (n = 25, 81%) and Caucasian (n = 27, 86%), with an average age of 34 years (SD = 11)	Combat exposure (in Iraq or Afghanistan)	Written emotional disclosure	Three 20 minute sessions WED: writing about one traumatic combat experience by exploring deepest emotions and thoughts (session 1), 'about how this event has affected your life' for session 2 and 'about how you currently feel about the event' for session; Control group: write about how they used their time: (1) today, (2) yesterday and (3) tomorrow	Control group	The Clinician Administered PTSD Scale; Patient Health Questionnaire—Depressive Symptoms; PTSD Checklist-Military; Patient Health Questionnaire-15; Short-Form-12	Although follow-up assessments did not reveal significant group differences in PTSD symptoms, half of the WED participants reported symptom reductions. Content analyses revealed that participants who expressed more emotion and cognitions were significantly more likely to experience decreased PTSD symptoms.
Sloan, Marx, & Greenberg (2011)	42 participants Mean age = 18.9 years 24 Caucasian, 9 African-American, 4 Hispanic, 3 Asian-American, and 2 "other" or mixed racial back-ground individuals.	Index traumatic events included sexual assault (n = 17), physical assault by stranger (n = 13), motor vehicle accident (n = 6), witness to a murder (n = 3) and warzone experience (n = 3)	Written emotional disclosure	3 consecutive days; 20 minutes each WED condition: write about the most traumatic experience of their lives with as much emotion and feeling as possible. Participants were also instructed to write about the same traumatic experience at each session; Control writing condition: write about how they spent their time each day without describing any emotion or opinions	Control condition	PTSD Symptom Scale—Interview; Beck Depression Inventory (second version); heart rate (using a Polar S810 HR monitor)	No significant group differences for PTSD and depression symptom severity at follow-up assessment. Relative to control participants, WED participants displayed significantly greater heart rate activity and reported greater emotional responding during the first writing session; however, no reduction in emotional responding occurred for either condition from the first to the last writing session.

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Sloan, Marx, Bovin, Feinstein, & Gallagher (2012)	46 participants from the greater Boston, MA area Average age = 40.65 years; 65% of participants were women Racial background was diverse with 37% Caucasian, 37% African-American, 8% Hispanic, 4% Asian-American, and, 14% identified as mixed racial background	Motor vehicle accident	Written exposure therapy	5 weekly sessions, first session lasting 1 hour and each subsequent session lasting 40 minutes WET condition: In the first session, participants were given PTSD psychoeducation and treatment rationale. The importance of delving into their deepest emotions and thoughts at the time of the accident was emphasized, as well as the importance of providing detailed information (e.g., what he/she saw, heard, smelled). For the remaining sessions, participants were instructed to focus on providing a detailed description of the part of the event that was most distressing to them and to describe how the event had affected their lives (e.g., how the event changed the way the person interacts with others, how the event has changed the way in which the person views his/her life). Sessions ended with the therapist instructing the participant to allow the experience of any trauma-related memories, images, thoughts or feelings in the week between sessions.	Waitlist condition	The Clinician-Administered PTSD Scale; Self-Assessment Manikin (self-reported emotion)	Participants assigned to WET showed significant reductions in PTSD symptom severity at 6- and 18-week post-baseline, relative to WL participants, with large between-group effect sizes. In addition, significantly fewer WET participants met diagnostic criteria for PTSD at both the 6- and 18-week post-baseline assessments, relative to WL participants. Treatment gains were maintained for the WET participants at the 30-week post baseline assessment.

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Smyth, Hockemeyer, & Tulloch (2008)	25 participants; 11 males and 14 females; Most participants (21; 84%) were Caucasian, with the remainder (4; 16%) being Native American. Recruited from two trauma care agencies: Veteran Affairs (VA) hospital or a community rape and trauma centre	War/combat (males), sexual assault (females)	Expressive writing	3 writing sessions in one day, 20 minutes each, with 15 minute breaks in between Expressive writing: Session 1 instructions focused on having participants identify and label the traumatic event, as well as associated thoughts, feelings, and sensations. Session 2 instructed participants to tell a story about the event, paying particular attention to how the traumatic event may have impacted them. Session 3 asked participants to examine through writing the rationality of their negative beliefs, and to re-tell their story incorporating any insight and/or benefit they found over the 3 sessions; Control group: focused on time management writing related to their daily plans	Control group	PTSD Symptom Scale Interview; The Profile of Mood States; Post-Traumatic Growth Inventory; saliva sample by sterile cotton wad	Writing did not decrease PTSD-related symptom severity. Although patients continue to exhibit the core features of PTSD, their capacity to regulate those responses appears improved following expressive writing. Dysphoric mood decreased after writing and when exposed to traumatic memories, participants' physiological response is reduced and their recovery enhanced.

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Stockton, Joseph, & Hunt (2014)	24 participants; (one male and 23 females; age range: 19-63 years; *M* = 33.18) Participants in this sample were predominantly white (*n* = 23; 95.8%)	Range of traumatic events, including childhood sexual abuse (*n* = 4), rape (*n* = 3), sudden or traumatic death of a friend or family member (*n* = 2), and diagnosis of a serious illness or injury (*n* =3)	Expressive writing	Three separate occasions, 15 minutes each Expressive writing: write about the most traumatic or distressing experience of their life with as much emotion and feeling as possible (same or different experience at each writing session); Control condition: write continuously about how they spent their time, their daily routine, and their plans for the following week	Control writing	Impact of Event Scale—Revised; Posttraumatic Growth Inventory—Short Form; Psychological Well-Being—Posttraumatic Changes Questionnaire	No changes in PTSD diagnosis or symptoms were observed, but significant improvements in mood and post-traumatic growth were observed in the expressive writing group. Expressive writing greatly attenuated neuroendocrine (cortisol) responses to trauma-related memories.
Truijens & van Emmerik (2014)	61 college students at the University of Amsterdamn	Traumatic events reported by the participants included having experienced or witnessed an accident (n = 10; 16.4%); physical, mental, or sexual abuse (n = 21; 34.5%); severe illness or death of a loved one (n = 21; 34.5%); and natural disaster or war (n = 9; 14.6%)	Written imaginal exposure	One session, 45 minutes Writing with visual feedback: describe most intense moment of their traumatic experience in first person and present tense and focus on sensory and emotional experiences. Wrote in a regular essay text box that remained visible on their computer screen; Writing without visual feedback condition: identical instructions but wrote in an essay text box that was reduced to the size of one character; Control condition: wrote in a regular text box, described their first day in their current and previous educational institutions	Writing with visual feedback condition, writing without visual feedback condition, control condition	Dutch version of the Impact of Events Scale; Dutch Screening Device for Psychotic Disorder; Dutch Suicidal Risk Taxation List	Writing with and without visual feedback equally reduced intrusion and avoidance symptoms. Exploratory analyses, however, showed increased intrusion symptoms immediately after writing with visual feedback, which was in contrast with decreased symptom levels in the other conditions.

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Wisco, Baker, & Sloan (2016)	46 individuals Participants randomized to the treatment condition had an average age of 39.45 (SD = 14.84), 16 (73%) were women, and racial background was diverse (40.9% White, 27.4% African-American, 13.5% Hispanic, 18.2% "other")	Motor-vehicle accident	Written exposure therapy	See Sloan et al. (2012) above for description	Waitlist condition	Clinician-Administered PTSD Scale; Self-Assessment Manikin; cardiac activity (using Polar S810 HR monitor)	Treatment gains were significantly associated with initial physiological activation, but not with within- or between-session changes in physiological arousal. Treatment gains were associated with larger between-session reductions in self-reported arousal.
Zakowski, Ramati, Morton, Johnson, & Flanigan (2014)	104 cancer patients Patients were between 25 and 84 years of age (M = 59.75, SD = 11.09); 51.9% were female, 95.2% were Caucasian	Serious illness or injury (prostate or gynecological cancer)	Written emotional disclosure	3 days for 20 minutes a day Emotional disclosure condition: write about deepest thoughts and feelings regarding their cancer experience; Control condition: describe in detail daily activities in a nonemotional manner	Control condition	Social constraints scale; Brief Symptoms Inventory; Impact of Events Scale	Results showed that written disclosure buffered the effects of social constraints on stress at the 6-month follow-up and that avoidance partly mediated these effects.