Theoretical Exploration of Expressive Writing Applied to Psychological Rescue During Social Disasters

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Abstract

During periods of social disasters such as pandemics, the number of trauma survivors increases dramatically; coupled with transportation disruptions, traditional psychological rescue efforts struggle to respond promptly to large-scale psychological crises among disaster victims. Expressive writing, however, can be implemented on a large scale by psychology practitioners and guided through remote communication tools such as telephone and internet to treat psychological trauma such as PTSD and improve physical and mental health. The mechanisms of expressive writing during social disaster periods are complex, involving exposure desensitization, meaning reconstruction, self-distancing–self-regulation, working memory optimization, and normalization of cognitive neural mechanisms; its therapeutic efficacy is influenced by potential factors such as author characteristics, intervention timing, and writing format. Accordingly, future research should incorporate local sociocultural factors, emphasize online intervention studies, explore the cognitive neural mechanisms related to expressive writing, and comprehensively evaluate the therapeutic efficacy of expressive writing using different physical and mental health indicators.

Full Text

A Theoretical Study on the Application of Expressive Writing to Psychological Rescue in Social Disasters

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Abstract

During social disasters such as epidemics, the number of individuals with traumatic experiences increases dramatically. Coupled with transportation disruptions, traditional psychological rescue efforts struggle to respond promptly to widespread mental health crises among disaster victims. Expressive writing, however, can be implemented on a large scale by psychology professionals and guided remotely via telephone, internet, and other telecommunication tools to treat psychological trauma such as PTSD and improve both physical and mental health. The mechanisms of expressive writing during social disasters are complex, involving exposure desensitization, meaning reconstruction, self-distancing-self-regulation, working memory optimization, and normalization of cognitive-neural mechanisms. Its therapeutic efficacy is influenced by potential factors including author characteristics, intervention timing, and writing format. Accordingly, future research should integrate local sociocultural factors, emphasize online intervention studies, explore the cognitive-neural mechanisms underlying expressive writing, and comprehensively evaluate its efficacy using diverse physical and mental health indicators.

Keywords: expressive writing, writing therapy, emotional expression, mental health, Chinese culture

Introduction

The COVID-19 pandemic that swept across China in early 2020 inflicted tremendous harm on society, with many people experiencing isolation or even losing their lives. Wang et al. (2020) surveyed 1,210 respondents across 194 Chinese cities and found that 53.8% reported moderate to severe psychological impacts from the pandemic, including 16.5% with moderate to severe depressive symptoms, 28.8% with moderate to severe anxiety symptoms, and 8.1% experiencing moderate to severe stress. This sharp increase in psychological problems placed enormous burdens on families and society, creating an urgent need for more convenient and efficient psychological interventions to improve national mental health. While verbal emotional expression has long been widely used in counseling and therapeutic practices, "writing therapy" —or "expressive writing" (EW), also known as "emotional disclosure" —has demonstrated positive effects on physical and mental well-being (Tarragona, 2019). Compared to traditional psychotherapy based on clients' verbal expression, EW offers several advantages: (1) it maximizes privacy protection; (2) authors have greater sense of self-control, as they determine the depth and level of their own disclosure; (3) it is more economical, requiring less therapist involvement and allowing for group guidance via telephone or internet; and (4) it facilitates therapists' ability to track and study its mechanisms of action based on the content and characteristics of the

text. In summary, EW is highly adaptable and can serve either as a standalone treatment or be integrated into traditional psychotherapy. This paper explores the feasibility and influencing factors of applying EW to Chinese social disaster contexts.

1. The History of Indigenous EW in China

Indigenous Chinese writing therapy has a long history embedded in religious, literary, and artistic activities, but its history as an empirical psychological research paradigm is relatively brief.

1.1. History of Writing Therapy in China

The history of writing therapy in China can be traced back to ancient times. In prehistoric society, shamans and witch doctors performed magical rituals as therapeutic interventions during various crises. The *Chu Ci* documents the pacifying effects of ancient Chinese mystical rituals on individuals and society, with wizards using chants or lyric songs to meet people' s psychological healing needs during witchcraft activities. This form evolved over time into more sophisticated literary language forms. Ancient texts contain numerous records of the concept of "using literature for healing." For instance, *Guanzi· Neiye* states "nothing is better than poetry for expressing anger," Tao Yuanming wrote that "literature is the best way to channel one' s will," and Zhong Rong noted in *Shi Pin Xu* that "for the poor to find peace and the reclusive to dispel melancholy, nothing surpasses poetry." These exemplify the healing function of literary creation. In 1988, Chinese anthropologist Ye Shuxian published two articles— "The Principles and Practice of Literary Therapy" and "Literature and Therapy: An Anthropological Study of Literary Functions" —marking the formal introduction of the concept of "literary therapy."

1.2. The Contemporary Relevance of Writing Therapy Research in China

Over the past half-century, China' s rapid economic and social development has provided opportunities for in-depth empirical psychological research on indigenous writing therapy. Since the reform and opening-up, Chinese people' s emotions have changed significantly: negative emotions have increased markedly while positive emotions have not changed substantially, with anxiety, depression, and other negative emotions among adolescents continuing to rise (Cai et al., 2020). In response, domestic scholars have conducted a series of EW intervention studies. Research on student populations (Wang & Wang, 2011; Qian & Zhou, 2012; Xu & Wen, 2014; Zhang et al., 2015; Zhang & Luo, 2016, etc.) found that EW positively impacts students' emotional improvement, well-being enhancement, reduction of test anxiety, and academic performance. Studies on populations with physical illnesses include breast cancer patients (Zhang et al., 2016; Liu et al., 2017; Ke & Ouyang, 2017), gestational diabetes patients (Shi et

al., 2016), infertile patients with depression (Shi et al., 2017), and thyroid cancer patients (Gao et al., 2020), with results showing that EW improved patients' physical and mental health to some extent.

Zang Yinbin applied writing exposure therapy (WET) and mindfulness therapy to Chinese PTSD patients to develop treatment plans suitable for Eastern cultures (Li et al., 2021). However, these studies had relatively small sample sizes, and future research should conduct large-sample experiments with sufficient statistical power for replication validation to address the reproducibility crisis in current psychological empirical research and further test the application of EW and other writing therapy forms in social disaster contexts and contemporary Chinese cultural environments. Cai et al. (2020) reviewed research on psychological and behavioral changes in Chinese people over the past half-century, outlining trends in Chinese cultural values: individualistic values adapted to modern society are increasingly prevalent, while traditional collectivist values are gradually weakening. However, major natural and social disaster events may affect group values. Xu et al. (2008) found that after the Wenchuan earthquake, practical values among college students in Beijing and Sichuan were somewhat weakened while social values became dominant. Therefore, during social disasters such as epidemics, further exploration of changes in sociocultural values in disaster areas is needed to develop the most suitable EW paradigms for local victims.

2. The Origins of the EW Paradigm

Although Chinese writing therapy has a long history, EW first emerged as an empirical psychological research paradigm in the United States. In the 1980s, Pennebaker discovered that many students had experienced sexual trauma, and those who had never discussed it were most likely to experience various health problems. This led him to develop the EW paradigm to help these secret-keepers expose their traumatic experiences and intervene in their psychological problems (Pennebaker, 2018). In Pennebaker and Beall' s (1986) first empirical study, college students were randomly assigned to four groups: the "trauma-emotion group"wrote about their feelings regarding a painful experience without mentioning any details of the traumatic event; the "trauma-fact group" wrote about the facts of the traumatic experience without mentioning any feelings; the "trauma-integration group" wrote about their deepest feelings regarding the painful experience along with the facts of the traumatic event; and the control group wrote about neutral topics, such as describing their room or shoes in detail.

The results showed that the trauma-integration group had significantly fewer visits to health centers during the six months following the writing exercise compared to the control group. Through writing, individuals integrated traumatic emotions and cognitions, gaining insight into their own emotions and traumatic events, thereby improving their long-term physical and mental health. Pennebaker believed that the key to expressive writing is that writers openly

acknowledge and accept their own emotions, freely expressing their suppressed feelings. Therefore, Pennebaker emphasized in his instructions that writers should "let go and write without worrying about spelling, grammar, or sentence structure." Subsequently, Pennebaker expanded traumatic event writing to include writing about general emotional events or specific experiences.

3. Potential Therapeutic Effects of EW During Social Disasters

During social disasters, EW demonstrates significant efficacy in posttraumatic stress disorder (PTSD) and posttraumatic growth, though its significant effects on physical health and depressive symptoms require further empirical investigation.

3.1. Physical Health

Compared to healthy populations, EW may have more significant effects on individuals with physical illnesses. EW has positive impacts on the physical health of patients with various diseases (Tarragona, 2019), such as improved symptoms in asthma and rheumatoid arthritis patients; enhanced quality of life in kidney transplant and breast cancer patients; better symptoms, pain relief, and improved sleep quality in cancer patients; reduced medication use in heart disease patients; and lowered blood pressure in hypertensive patients. Wu et al. (2018) conducted a meta-analysis of EW intervention effects on posttraumatic stress responses in breast cancer patients and found that EW could alleviate physical symptoms such as headaches, stomachaches, chest pain, and muscle pain. However, these studies focused on clinical populations, and no significant EW effects were found in adult populations without serious physical diseases (Niles et al., 2014), possibly due to a "ceiling effect" where individuals with milder physical symptoms have limited room for improvement from EW.

Epidemics, earthquakes, and wildfires may directly cause varying degrees of physical injury to disaster victims. For example, Lam (2009) found that SARS survivors experienced significantly increased chronic fatigue, while Chew et al. (2020) surveyed physical symptoms among medical staff during the pandemic and found headaches to be the most common (32.3%). The question arises: does EW during disasters have more significant positive effects on individuals' physical health compared to non-disaster periods? A meta-analysis of EW intervention effects in bereaved populations found no evidence that EW could improve physical health (Li & Miao, 2019). Therefore, future research needs to further examine the relationship between writers' baseline physical health levels and EW efficacy and explore mediating variables between the two.

3.2. Mental Health

During social disasters, EW may help alleviate PTSD symptoms, reduce perceived stress, and promote posttraumatic growth. Research shows that EW

significantly enhanced psychological resilience and reduced depressive symptoms, perceived stress, and rumination in outpatients with PTSD (Glass et al., 2019); EW promoted posttraumatic growth in pregnant women and preconception women affected by wildfires, enhancing their adaptability and emotional connection (Brémault-Phillips et al., 2020); and EW significantly reduced perceived stress and depressive symptoms while increasing posttraumatic growth levels in populations affected by the pandemic (Bechard et al., 2021). However, a meta-analysis of EW in general populations found that for healthy adults who perceived varying levels of stress but had no PTSD symptoms, EW' s long-term efficacy in reducing depressive symptoms was not significant (Reinhold et al., 2018). Future research needs to explore whether EW has stable long-term effects on reducing depressive symptoms during social disasters.

4. Mechanisms of EW During Social Disasters

The mechanisms of EW during social disasters are complex and multidimensional, involving psychological processes such as exposure desensitization, meaning reconstruction, self-distancing-self-regulation, and working memory optimization, as well as normalization of cognitive-neural mechanisms.

4.1. Exposure Desensitization

Exposure desensitization is an important mechanism through which EW alleviates negative emotions in disaster victims. Repeated exposure to traumatic stimuli extinguishes conditioned stress and emotional responses (Foa & Kozak, 1986). Sloan et al. (2005) found that college students with trauma histories or at least moderate PTSD stress responses benefited more from repeatedly writing about the same traumatic event than writing about different traumatic events, as it helped reduce physical and psychological symptoms. Therefore, individuals' repeated retrieval of traumatic memories, especially specific details, may be an important mechanism for extinguishing negative emotions such as fear. Additionally, research shows that evocative words and images such as "war," "killer," "battle," and "invisible threat" help increase negative emotional expression when people define danger (Wald, 2008). Future research could incorporate traumatic images into EW instructions or guide patients to use more visual language to promote negative emotional expression, thereby achieving exposure desensitization and enhancing EW efficacy.

4.2. Meaning Reconstruction

Reconstructing the meaning of traumatic events is an essential component of EW and may be an important mechanism for its long-term positive psychological effects in disaster victims. Bucci' s (1997, 2001) multiple code theory posits that humans have three representational systems: a subsymbolic system in the nonverbal symbolic system (such as sensations, bodily experiences, and behavioral patterns) and a symbolic system (such as images and visual scenes), as

well as a linguistic symbolic system (words and speech). These three systems are interconnected through bidirectional referential processes (RP) to express and process emotional information. When RP is interrupted by specific internal conflicts or traumatic events, the connection between the subsymbolic system in the emotional schema and the nonverbal and linguistic symbolic systems breaks down. At this point, through narration of the traumatic event, individuals obtain specific memories or images that link bodily sensations and behavioral patterns to specific traumatic memories. Subsequently, by constructing the emotional meaning of the event, they connect abstract meanings to concrete events, rebuilding the connection between nonverbal and linguistic symbolic systems, thereby giving meaning to intense, inexpressible emotional experiences—this is crucial for psychotherapy. Pennebaker et al. found through lexical analysis that increased use of causal words (e.g., "because," "cause," "effect") and insight words (e.g., "consider," "know") positively predicted EW efficacy (Pennebaker, 1993). Negri et al. (2020) used computer language programs to analyze writing content from people in Italy' s hardest-hit COVID-19 area and found that the more emotion invested in writing, the more vivid and concrete the trauma description, and the greater the ability to reflect on the emotional meaning of trauma, indicating a positive correlation between RP level and reflective reorganization. EW' s meaning reconstruction mechanism shares similarities with wisdom therapy. Berlin wisdom paradigm training helped patients with posttraumatic embitterment disorder (PTED) develop wiser understanding of life dilemmas (more diverse and broader perspectives, understanding of fundamental life facts, and acceptance of uncertainty), with their symptom scores (SCL90) decreasing significantly more than those in traditional treatment groups (Linden et al., 2011).

However, cultural differences between East and West and linguistic differences between Chinese and English may mean that EW repeatedly practiced in Western culture and English contexts may not effectively generalize to Chinese indigenous environments. For example, the cornerstone of Western literature—Greek literature, most notably represented by the *Iliad* and *Odyssey*—is narrative-based, while the origins of Chinese literature, the *Book of Songs* and *Li Sao*, are lyric-based, emphasizing the expression of inner emotions. Therefore, for Chinese writing, deeper research is needed on the relationship between intrinsic factors such as emotional expressiveness, 感染力 (infectiousness), and ideological depth and EW efficacy.

4.3. Self-Distancing-Self-Regulation

EW helps disaster victims regulate their emotional and cognitive processes from a greater psychological distance. Psychological distance refers to the cognitive separation between the self and a person, event, or object, comprising five dimensions: temporal distance, spatial distance, social distance, hypothetical distance, and informational distance (Sergiu, 2014). Typically, individuals struggle to recognize their own problems because they are fused with them. Park et al. (2016)

conducted two longitudinal experimental studies and found that on day 2 post-intervention, the writing group showed higher self-distancing than the control group, leading to fewer emotional reactions during follow-up at one month (both experiments) and six months (experiment two). Over time, the writing group used increasingly more causal words and fewer negative emotion words and first-person singular pronouns, indicating that writing can promote self-distancing by separating the "present self as narrator" from the "past self as protagonist," allowing individuals to think about problems from a detached perspective, reducing emotional reactions and subsequently decreasing physical symptoms. Rodriguez et al. (2021) found in an EW intervention study on partner conflicts during pandemic isolation that compared to the control group, participants who narrated conflicts with their partner from a neutral third-party perspective (using cognitive reappraisal techniques) reported fewer perspective differences, less mutual attacking behavior, and fewer conflicts. Therefore, future research could further examine EW efficacy from different dimensions of psychological distance.

4.4. Working Memory Optimization

Working memory (WM) is a capacity-limited cognitive processing system, and the complex, uncertain information during social disasters may interfere with WM' s normal functioning, while EW optimizes WM function by organizing fragmented information. Ramirez and Beilock (2011) reported in *Science* that a 10-minute EW exercise before important exams could reduce anxiety' s interference with working memory and improve test performance in anxiety-prone students. First, memories of stressful events carry intense emotions, and when similar internal or external stimuli appear, the traumatic memory network becomes activated. Therefore, stressful events are often accompanied by repeated intrusions of thoughts, emotions, and behaviors (Brewin et al., 1996; Horowitz, 2011), and suppressing these intrusive thoughts consumes WM resources (Klein, 2002). Second, each conscious suppression creates a new idea, establishing many redundant connections between intrusive memories and other cognitions, a process that exacerbates WM resource consumption while enhancing the accessibility of memory fragments (Wegner et al., 1996). Finally, to promote trauma recovery, individuals need to process new traumatic information to integrate it into existing schemas or modify existing schemas to accommodate new traumatic information (Foa & Kozak, 1986; Creamer et al., 1992). Therefore, through writing, trauma is fully exposed, reducing suppression behaviors, and fragmented information is integrated into a coherent narrative, replacing scattered information with unified "chunks," thereby reducing WM resource consumption.

4.5. Normalization of Cognitive-Neural Mechanisms

During social disasters, intense emotional experiences involve hyperactivation of emotional centers such as the amygdala, which interferes with hippocampal activity and affects individuals' processing of spatiotemporal contextual

cues, making disaster victims feel as though traumatic experiences occurred recently even long after the event, or even experiencing PTSD symptoms such as "flashbacks." EW can form complete, coherent autobiographical narratives that reconstruct the spatiotemporal structure of events. Brewin et al.' s (1996) dual processing model divides traumatic memory into verbally accessible memories (VAMs, also called autobiographical memories) and situationally accessible memories (SAMs). Autobiographical memories are embedded in rich spatiotemporal contexts that help enhance self-awareness and are particularly sensitive to hippocampal damage (Rekkas & Constable, 2005), while SAMs involve specific emotional (primarily fear) physiological and behavioral responses related to the trauma and are closely associated with the amygdala. Akiki et al. (2017) used high-resolution magnetic resonance imaging and found that patients with more severe PTSD showed indentations in the anterior part of the right hippocampus and the dorsal region of the right amygdala (corresponding to the centromedial amygdala), with these deformations related to patients' emotional arousal and re-experiencing symptoms. Robjant and Fazel (2010) argued that reduced hippocampal function prevents spatiotemporal information from being integrated into memory, causing narrative difficulties. In other words, missing contextual information leads to fragmented autobiographical memory, preventing individuals from escaping current threat situations and causing traumatic memories to continuously "flash back," resulting in more severe psychological disorders. Therefore, the goal of EW is to strengthen autobiographical memory encoding when SAMs are activated, timely locate events, and "place" traumatic event memories back into their original spatiotemporal structure within autobiographical narratives, making past trauma truly past rather than forever "still yesterday."

5. Potential Influencing Factors on EW Efficacy During Social Disasters

Given the varying effects of EW in research, further exploration of the most beneficial conditions for EW during disasters is necessary. Currently identified factors affecting efficacy include author characteristics, intervention timing, and writing format.

5.1. Author Characteristics

Individual characteristics of disaster victims (such as ambivalence over emotional expression, emotion regulation ability) and baseline physical and mental health levels may influence EW efficacy. Niles et al. (2014) evaluated moderating factors of EW efficacy in healthy adults, including emotional expression, emotional processing, and ambivalence over emotional expression. The results showed that emotional expressivity significantly moderated anxiety: highly expressive writers showed significant anxiety reduction at three-month follow-up, while less expressive writers showed significant anxiety increase, suggesting that writing interventions produce better outcomes when aligned with individuals'

natural coping styles. Negri et al. (2020) also found in their pandemic-period EW study that when facing death, some participants' health improved significantly after only 1-2 writing sessions, while those with emotion regulation difficulties were too distressed to complete writing. This indicates that individuals' emotion regulation abilities affect EW implementation and efficacy, with writers having low emotion regulation ability finding it difficult to benefit from EW.

Procaccia (2021) found in an EW intervention study with Italian medical staff during COVID-19 that participants with higher baseline symptom scores experienced greater psychological distress reduction after writing, while those with lower baseline scores showed greater improvements in social support and psychological resilience. Therefore, future research needs to further explore the moderating roles of individuals' emotional processing styles and baseline physical and mental health levels in EW efficacy.

5.2. Intervention Timing

The length of time between disaster occurrence and EW intervention also affects efficacy. Kacewicz et al. (2007) analyzed nearly 1,100 internet users' blogs during the two months before and after the 9/11 terrorist attacks and found that posting frequency increased sharply only two weeks after the attacks. Kacewicz argued that individuals' psychological defense mechanisms, such as denial, detachment, distraction, and distancing, may only begin functioning normally several hours or days after the traumatic event. Therefore, researchers recommend that clinicians wait at least 1-2 months after the traumatic event ends or until patients have repeatedly reflected on the trauma before conducting EW interventions. However, these studies focused on single-incident trauma with relatively clear endpoints, whereas some social disasters—such as the COVID-19 pandemic—represent ongoing complex trauma with large fluctuations and wide-ranging impacts, making their endpoints difficult to determine. Therefore, intervention timing for populations experiencing ongoing complex trauma needs to be determined by therapists based on the specific timing and degree of impact of the disaster on individuals. Future research could compare EW intervention efficacy at different time periods after disaster impact (e.g., within 6 months vs. after 6 months).

5.3. Writing Format

Factors influencing EW efficacy in terms of writing format include writing topic and writing perspective.

5.3.1. Writing Topic Different writing topics may affect EW efficacy. Vukčević Marković et al. (2020) found that disaster victims affected by the pandemic experienced increased perceived stress after completing traditional Pennebaker-style EW, with no significant differences in depression, anxiety, or well-being compared to the control group. Bechard et al. (2021) used a writing intervention program based on positive psychology resilience-building techniques,

with writing topics including Pennebaker paradigm trauma-emotion exposure, as well as new perspectives, gratitude and forgiveness toward self and others, self-strengths, future hope, and exploration of lessons learned—aiming to help writers shift from negative emotional expression about the pandemic to insight about pandemic life and focus on self-growth. The results showed significant improvements in writers' psychological resilience and posttraumatic growth, along with significant reductions in perceived stress and depressive symptoms. Therefore, facing complex, prolonged social disasters, simple emotional disclosure writing may be insufficient, requiring more positive psychology-themed writing to broaden perspectives, discover self-strengths, and find new hope in life. Additionally, Tsai et al. (2015) examined cultural mechanisms' influence on EW and found that self-improvement content writing (upward social comparison and perseverance through difficulties) reduced anxiety and depressive symptoms in Asian Americans, while self-enhancement content writing (downward social comparison and situational attribution) increased their anxiety and depressive symptoms, with European Americans showing the opposite pattern. This indicates that writing topics should align with authors' cultural values: topics coordinated with one' s culture can promote psychological function improvement, while culturally incongruent topics may hinder it.

5.3.2. Writing Perspective The specific utility of different person perspectives in writing may vary. Seih et al. (2011) found that whether in experiment one with single-perspective (first-person, second-person, or third-person) writing or experiment two with switching perspectives (e.g., from first-person to second-person to third-person), first-person writing used more cognitive words than third-person writing, indicating that when narrating negative emotional experiences, first-person perspective writing maximizes cognitive processing depth. However, in experiment two, each perspective was used only once; future research could try multiple writing sessions from one perspective before switching to others. Giovanetti et al. (2019) also found that the first-person perspective writing group reported fewer depressive symptoms than the third-person perspective group, with the third-person group even reporting more depressive symptoms than the control group. However, Pennebaker noted in his book *The Secret Life of Pronouns* (2011) that depressed individuals tend to use the pronoun "I" more frequently than non-depressed individuals. Verduyn et al. (2012) found that when reflecting on negative events, the self-immersed (first-person) perspective group experienced longer-lasting negative emotions compared to the self-distanced (third-person) perspective group. Dorfman et al. (2019) found that third-person perspective writing about interpersonal conflicts increased positive emotions, while first-person perspective writing showed no significant effect. Therefore, in trauma event writing interventions, writing perspective (first-person vs. third-person) may need to be adjusted according to different writing stages (e.g., emotional exposure vs. cognitive reappraisal and integration) to achieve better outcomes.

6. Future Research Directions

Current research on EW during social disasters has three main limitations: few studies on online writing applicable to disaster contexts, insufficient exploration of cognitive-neural mechanisms, and varying effects of EW across different dependent variables. Therefore, future research should further investigate three aspects.

6.1. Networked EW Research

Networked EW during social disasters may be a future research priority. During social disasters, the number of trauma survivors increases dramatically, leading to severe shortages of mental health professionals (Zang et al., 2013), compounded by transportation disruptions. In such situations, online writing can more widely provide psychological rescue services to disaster victims in remote areas with lower socioeconomic status or those isolated due to pandemics. Researchers have conducted a small number of online writing intervention studies during disasters, showing some efficacy, such as those by Negri et al. (2020), Bechard et al. (2021), and Rodriguez et al. (2021).

With the development of internet technology, traditional writing methods are gradually being replaced by social networks (e.g., Facebook, Twitter, Weibo, WeChat), which provide writers with opportunities for self-disclosure and sharing (Ruini & Mortara, 2021). Sloan et al. (2015) designed a web-based structured writing program including: phase one, where PTSD patients detailed their feelings and thoughts about traumatic events; phase two, focusing on cognitive reappraisal of trauma; and phase three, sharing trauma details with close others, with therapists providing feedback after each writing session. However, when implementing large-scale online writing, the safety scope of sharing must be considered. If writers are unwilling to share, privacy can be protected through anonymity and password settings. For example, Park et al. (2021) created a chatbot assistant (diarybot) that encourages writing and provides guidance for self-reflection while ensuring privacy. Therefore, future research needs to explore how networked writing affects the implementation and development of psychological therapy.

6.2. Exploring the Cognitive-Neural Mechanisms of EW' s Healing Power

Currently, relatively few EW studies have employed cognitive-neuroscience technologies. Wang et al. (2015) first examined frontal alpha asymmetry (FAA) in cognitive reappraisal EW and found that FAA in the cognitive reappraisal EW group was significantly lower than in the irrelevant writing group post-intervention, while FAA was significantly higher when re-exposed to stress. Schroder et al. (2018) found that the error-related negativity (an event-related potential immediately following errors, often positively correlated with anxiety levels) was smaller in the EW group than in the control group. Future research

could use relatively non-intrusive technologies such as wireless EEG and near-infrared brain imaging to explore cognitive-neural activities accompanying the EW process, thereby deepening understanding of the cognitive-neural mechanisms underlying improvements in physical and psychological symptoms.

6.3. Comprehensive Assessment of EW Intervention Efficacy

Future research should comprehensively assess EW intervention efficacy during social disasters by combining different psychological and physiological indicators. Psychological indicators for evaluating EW efficacy include negative symptoms (e.g., PTSD symptoms, depression, anxiety, perceived stress) and positive psychological factors (e.g., psychological well-being, social support). Physiological indicators include subjective physical health reports and objective physiological function indicators, medical visits, and changes in health behaviors. Current pandemic-period EW intervention studies have shown inconsistent results: some reduced PTSD and depressive symptoms in disaster victims (Procaccia et al., 2021); some reduced interpersonal conflicts between pandemic-affected couples (Rodriguez et al., 2021); some improved psychological resilience and reduced perceived stress and depressive symptoms (Bechard et al., 2021); but some found that EW increased perceived stress (Vukčević Marković et al., 2020) or failed to improve psychological well-being in pandemic-affected college students (Sari & Saleh, 2021). Park et al. (2016) found that EW promoted self-distancing, reduced emotional reactions, and subsequently decreased physical symptoms. Chew et al. (2020) found significant correlations between physical and psychological symptoms among medical staff during the pandemic. Therefore, future research can further explore the relationship between writers' psychological and physical symptoms after EW intervention.

As an economical, efficient, easily network-disseminated, and relatively safe psychological treatment, EW has tremendous application potential during social disasters and deserves in-depth exploration by researchers. Although numerous empirical studies have shown significant efficacy of EW on physical and mental health, some studies have found different results in certain populations and symptoms. Given the complexity of EW mechanisms, implementation should "tailor" writing programs according to different groups' physical and psychological characteristics, considering potential influencing factors such as writers' personality traits, cultural values, and psychological developmental stages, exploring expression methods adapted to different groups to better apply EW to psychological rescue work during social disasters.

References

Cai, H., Huang, Z., Lin, L., Zhang, M., Wang, X., Zhu, H., & Jing, Y. (2020). Changes in Chinese psychology and behavior over half a century: A psychological perspective. *Advances in Psychological Science*, *10*, 1599-1618.

Gao, J., Wang, X., Sun, L., & Wang, S. (2020). Application of expressive writing

in patients with newly diagnosed thyroid cancer. *Journal of Nurses Training*, *35*(05), 468-472.

Ke, J., & Ouyang, Y. (2017). Meta-analysis of the effect of expressive writing on health outcomes in breast cancer patients. *Journal of Nursing Science*, *32*(16), 96-99.

Li, J., & Miao, X. (2019). Application progress of expressive writing in bereaved populations. *Chinese Journal of Clinical Psychology*, *27*(03), 638-643. https://doi.org/10.16128/j.cnki.1005-3611.2019.03.043

Liu, S., Qiang, W., Shen, A., & Chen, Y. (2017). Effects of expressive writing on benefit finding, depressive mood, and sleep quality in breast cancer patients undergoing chemotherapy. *Chinese Nursing Management*, *17*(09), 1181-

Qian, J., & Zhou, X. (2012). Intervention study of structured writing in coping with psychological stress sources in high school students. *China Journal of Health Psychology*, *20*(02), 318-320. https://doi.org/10.13342/j.cnki.cjhp.2012.02.044

Shi, X., Shao, W., & Liu, X. (2016). Effect of expressive writing on psychological resilience and self-efficacy in patients with gestational diabetes mellitus. *Journal of Nursing Science*, *31*(20), 4-6.

Shi, X., Cai, L., & Zhao, J. (2017). Study on the effect of expressive writing in reducing depression in infertile patients. *Clinical Research and Practice*, *2*(07), 168-169+189. https://doi.org/10.19347/j.cnki.2096-1413.201707085

Wang, Y., & Wang, Z. (2011). Effect of expressive writing of positive emotions on well-being and coping styles. *Chinese Journal of Clinical Psychology*, *19*(1), 130-132. https://doi.org/10.16128/j.cnki.1005-3611.2011.01.005

Wu, Q., Li, Y., Chen, L., & Zhang, P. (2018). Meta-analysis of the intervention effect of expressive writing on posttraumatic stress response in breast cancer patients. *Nursing Journal of Chinese People' s Liberation Army*, *35*(16), 8-15.

Xu, Y., Wang, F., & Jia, H. (2008). Comparison of value types between Sichuan and Beijing college students after the May 12 earthquake. *Psychological Exploration*, *04*, 46-50.

Xu, Y., & Wen, S. (2014). Intervention study of expressive writing on negative emotions of depression and anxiety. *The Science Education Article Collects*, 08, 207-208.

Zhang, D., & Luo, F. (2016). Experimental study on using expressive writing to reduce test anxiety in high school students. *Chinese Journal of Special Education*, 02, 92-96.

Zhang, Y., Ji, L., & Lu, G. (2016). Research progress on the psychological impact of expressive writing on breast cancer patients. *Chinese Journal of Nursing*, *01*, 94-97.

Zhang, X., Zhang, H., Dong, Y., & Zhou, R. (2015). Effect of expressive writing on CET-6 test scores of college students with high test anxiety. *Chinese Journal of Special Education*, 03, 92–96.

Akiki, T. J., Averill, C. L., Wrocklage, K. M., Schweinsburg, B., Scott, J. C., Martini, B., Averill, L. A., Southwick, S. M., Krystal, J. H., & Abdallah, C. G. (2017). The association of PTSD symptom severity with localized hippocampus and amygdala abnormalities. *Chronic Stress*. https://doi.org/10.1177/2470547017724069

Bechard, E., Evans, J., Cho, E., Lin, Y., Kozhumam, A., Jones, J., Grob, S., & Glass, O. (2021). Feasibility, acceptability, and potential effectiveness of an online expressive writing intervention for COVID-19 resilience. *Complementary Therapies in Clinical Practice*. https://doi.org/10.1016/j.ctcp.2021.101460

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, *103*(4), 670.

Brémault-Phillips, S., Pike, A., Olson, J., Severson, E., & Olson, D. (2020). Expressive writing for wildfire-affected pregnant women: Themes of challenge and resilience. *International Journal of Disaster Risk Reduction*, *50*, 101730. https://doi.org/10.1016/j.ijdrr.2020.101730

Bucci, W. (1997). Symptoms and symbols: A multiple code theory of somatization. *Psychoanalytic Inquiry*, *17*(2). https://doi.org/10.1080/07351699709534117

Bucci, W. (2001). Pathways of emotional communication. *Psychoanalytic Inquiry*, *21*(1), 40–70. https://doi.org/10.1080/07351692109348923

Chew, N. W. S., Lee, G. K. H., Tan, B. Y. Q., Jing, M., Goh, Y., Ngiam, N. J. H., Yeo, L. L. L., Ahmad, A., Ahmed Khan, F., Napolean Shanmugam, G., Sharma, A. K., Komalkumar, R. N., Meenakshi, P. V., Shah, K., Patel, B., Chan, B. P. L., Sunny, S., Chandra, B., Ong, J. J. Y., …Sharma, V. K. (2020). A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain, Behavior, and Immunity*. https://doi.org/10.1016/j.bbi.2020.04.049

Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: A cognitive processing model. *Journal of Abnormal Psychology*, *101*(3), 452.

Dorfman, A., Oakes, H., Santos, H. C., & Grossmann, I. (2019). Self-distancing promotes positive emotional change after adversity: Evidence from a micro-longitudinal field experiment. *Journal of Personality*. https://doi.org/10.1111/jopy.12534

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, *99*(1), 35. https://doi.org/10.1037/0033-2909.99.1.20

Giovanetti, A. K., Revord, J. C., Sasso, M. P., & Haeffel, G. J. (2019). Self-distancing may be harmful: Third-person writing increases levels

of depressive symptoms compared to traditional expressive writing and no writing. *Journal of Social and Clinical Psychology*, *38*(1), 50–69. https://doi.org/10.1521/jscp.2019.38.1.50

Glass, O., Dreusicke, M., Evans, J., Bechard, E., & Wolever, R. Q. (2019). Expressive writing to improve resilience to trauma: A clinical feasibility trial. *Complementary Therapies in Clinical Practice*. https://doi.org/10.1016/j.ctcp.2018.12.005

Horowitz, M. J. (2011). *Stress response syndromes: PTSD, grief, adjustment, and dissociative disorders* (5th ed., pp. 11-12). Lanham, MD: Jason Aronson Publisher, Inc.

Kacewicz, E., Slatcher, R. B., & Pennebaker, J. W. (2007). Expressive writing: An alternative to traditional methods. In L. L' Abate (Ed.), *Low-cost approaches to promote physical and mental health* (pp. 271-284). New York: Springer. https://doi.org/10.1007/0-387-36899-X_{13}

Klein, K. (2002). Stress, expressive writing, and working memory. In S. J. Lepore & J. M. Smyth (Eds.), *The writing cure: How expressive writing promotes health and emotional well-being* (pp. 135–155). Washington, DC: American Psychological Association. https://doi.org/10.1037/10451-007

Lam, M. H.-B. (2009). Mental morbidities and chronic fatigue in severe acute respiratory syndrome survivors: Long-term follow-up. *Archives of Internal Medicine*, *169*(22), 2142. https://doi.org/10.1001/archinternmed.2009.384

Li, M., Wang, B., Chen, Q., Gao, D., & Zang, Y. (2021). Written exposure therapy and app-delivered mindfulness-based meditation for PTSD and subthreshold PTSD in China: Design of a randomized controlled trial. *Contemporary Clinical Trials Communications*. https://doi.org/10.1016/j.conctc.2021.100729

Linden, M., Baumann, K., Lieberei, B., Lorenz, C., & Rotter, M. (2011). Treatment of posttraumatic embitterment disorder with cognitive behaviour therapy based on wisdom psychology and hedonia strategies. *Psychotherapy and Psychosomatics*, *80*(4), 199–205. https://doi.org/10.1159/000321580

Negri, A., Andreoli, G., Barazzetti, A., Zamin, C., & Christian, C. (2020). Linguistic markers of the emotion elaboration surrounding the confinement period in the Italian epicenter of COVID-19 outbreak. *Frontiers in Psychology*, *11*, 568281. https://doi.org/10.3389/fpsyg.2020.568281

Niles, A. N. (2014). Randomized controlled trial of expressive writing for psychological and physical health: The moderating role of emotional expressivity. *Anxiety, Stress, & Coping*, *27*(1), 17. https://doi.org/10.1080/10615806.2013.802308

Park, J., Ayduk, Ö., & Kross, E. (2016). Stepping back to move forward: Expressive writing promotes self-distancing. *Emotion*, *16*(3). https://doi.org/10.1037/emo0000121

Park, S., Thieme, A., Han, J., Lee, S., Rhee, W., & Suh, B. (2021). "I wrote as

if I were telling a story to someone I knew." : Designing chatbot interactions for expressive writing in mental health. *Designing Interactive Systems Conference 2021*, 926–941. https://doi.org/10.1145/3461778.3462143

Pennebaker, J. W. (2011). *The secret life of pronouns: What our words say about us* (1st U.S. ed., pp. 122-124). London, WC: Bloomsbury Press.

Pennebaker, J. W. (1993). Putting stress into words: Health, linguistic, and therapeutic implications. *Behaviour Research and Therapy*, *31*(6). https://doi.org/10.1016/0005-7967(93)90105-4

Pennebaker, J. W. (2018). Expressive writing in psychological science. *Perspectives on Psychological Science*, *13*(2). https://doi.org/10.1177/1745691617707315

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology*, *95*(3), 274–281.

Procaccia, R. (2021). Benefits of expressive writing on healthcare workers' psychological adjustment during the COVID-19 pandemic. *Frontiers in Psychology*, *12*, 10.

Ramirez, G., & Beilock, S. L. (2011). Writing about testing worries boosts exam performance in the classroom. *Science*, *331*(6014). https://doi.org/10.1126/science.1199427

Reinhold, M., Bürkner, P.-C., & Holling, H. (2018). Effects of expressive writing on depressive symptoms—A meta-analysis. *Clinical Psychology: Science and Practice*, *25*(1), e12224. https://doi.org/10.1111/cpsp.12224

Rekkas, P. V., & Constable, R. T. (2005). Evidence that autobiographic memory retrieval does not become independent of the hippocampus: An fMRI study contrasting very recent with remote events. *Journal of Cognitive Neuroscience*, *17*(12), 1950–1961. https://doi.org/10.1162/089892905775008652

Robjant, K., & Fazel, M. (2010). The emerging evidence for narrative exposure therapy: A review. *Clinical Psychology Review*, *30*(8), 1030–1039. https://doi.org/10.1016/j.cpr.2010.07.004

Rodriguez, L. M., Stewart, S. H., & Neighbors, C. (2021). Effects of a brief web-based interpersonal conflict cognitive reappraisal expressive-writing intervention on changes in romantic conflict during COVID-19 quarantine. *Couple and Family Psychology: Research and Practice*, *10*(3), 212–222. https://doi.org/10.1037/cfp0000173

Ruini, C., & Mortara, C. C. (2021). Writing technique across psychotherapies—From traditional expressive writing to new positive psychology interventions: A narrative review. *Journal of Contemporary Psychotherapy*. https://doi.org/10.1007/s10879-021-09520-9

Sari, R., & Saleh, M. N. I. (2021, January). Improving mental well-being of undergraduate students during COVID-19 pandemic: Proceedings of

the 4th International Conference on Sustainable Innovation 2020–Social, Humanity, and Education (ICoSIHESS 2020). Yogyakarta, Indonesia. https://doi.org/10.2991/assehr.k.210120.110

Schroder, H. S., Moran, T. P., & Moser, J. S. (2018). The effect of expressive writing on the error-related negativity among individuals with chronic worry. *Psychophysiology*, *55*(2), e12990. https://doi.org/10.1111/psyp.12990

Seih, Y.-T., Chung, C. K., & Pennebaker, J. W. (2011). Experimental manipulations of perspective taking and perspective switching in expressive writing. *Cognition & Emotion*, *25*(5), 926–938. https://doi.org/10.1080/02699931.2010.512123

Sergiu Baltatescu. (2014). Psychological distance. In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (p. 5145). Netherlands: Springer.

Sloan, D. M., Marx, B. P., & Epstein, E. M. (2005). Further examination of the exposure model underlying the efficacy of written emotional disclosure. *Journal of Consulting and Clinical Psychology*, *73*(3), 549–554. https://doi.org/10.1037/0022-006X.73.3.549

Sloan, D. M., Sawyer, A. T., Lowmaster, S. E., Wernick, J., & Marx, B. P. (2015). Efficacy of narrative writing as an intervention for PTSD: Does the evidence support its use? *Journal of Contemporary Psychotherapy*, *45*(4), 215–225. https://doi.org/10.1007/s10879-014-9292-x

Tarragona, M. (2019). Personal narratives, expressive writing and well-being. In C. R. Snyder, S. J. Lopez, L. M. Edwards, & S. C. Marques (Eds.), *The Oxford handbook of positive psychology* (3rd ed., pp. 892-907). New York, NY: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199396511.013.52

Tsai, W., Lau, A. S., Niles, A. N., Coello, J., Lieberman, M. D., Ko, A. C., Hur, C., & Stanton, A. L. (2015). Ethnicity moderates the outcomes of self-enhancement and self-improvement themes in expressive writing. *Cultural Diversity and Ethnic Minority Psychology*, *21*(4). https://doi.org/10.1037/cdp0000012

Verduyn, P., Van Mechelen, I., Kross, E., Chezzi, C., & Van Bever, F. (2012). The relationship between self-distancing and the duration of negative and positive emotional experiences in daily life. *Emotion*, *12*(6), 1248.

Vukčević Marković, M., Bjekić, J., & Priebe, S. (2020). Effectiveness of expressive writing in the reduction of psychological distress during the COVID-19 pandemic: A randomized controlled trial. *Frontiers in Psychology*, *11*, 587282. https://doi.org/10.3389/fpsyg.2020.587282

Wald, P. (2008). *Contagious: Cultures, carriers, and the outbreak narrative* (pp. 23-28). Durham, NC: Duke University Press.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage

of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5), 1729. https://doi.org/10.3390/ijerph17051729

Wang, F., Wang, C., Yin, Q., Wang, K., Li, D., Mao, M., Zhu, C., & Huang, Y. (2015). Reappraisal writing relieves social anxiety and may be accompanied by changes in frontal alpha asymmetry. *Frontiers in Psychology*, *6*, 1604. https://doi.org/10.3389/fpsyg.2015.01604

Wegner, D. M., Quillian, F., & Houston, C. E. (1996). Memories out of order: Thought suppression and the disturbance of sequence memory. *Journal of Personality and Social Psychology*, *71*(4), 680.

Zang, Y., Hunt, N., & Cox, T. (2013). A randomised controlled pilot study: The effectiveness of narrative exposure therapy with adult survivors of the Sichuan earthquake. *BMC Psychiatry*, *13*(1), 41. https://doi.org/10.1186/1471-244X-

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