

The Effects of a Self-Disclosure Program Using Expressive Writing on Optimism, Problem-Focused Coping, Deliberate Rumination, and Posttraumatic Growth of Korean Firefighters with Rescue-Firefighting Duties: A Pilot Study

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Abstract

Background: Firefighters are frequently exposed to job-related traumatic events that may have negative health consequences. Therefore, the purpose of this study was to examine the effects of a self-disclosure program using expressive writing to enhance firefighters' positive psychological improvements.

Materials and Methods: Allowing for attrition, 28 firefighters working in rescue-firefighting duties were recruited from five fire stations in Changwon in 2018. An experimental group received the self-disclosure program, in which expressive writing consisted of four sessions for enhancing post-traumatic growth. Participants filled out the Life Orientation Test-Revised Optimism Scale, the Korean version of the Brief COPE for problem-focused coping, the Korean version of the Event-Related Ruminating Scale to measure ruminative thinking, and the Korean version of the Posttraumatic Growth Inventory to measure posttraumatic development. The data were analyzed by frequency, mean and standard deviation, and paired t-test using the SPSS/WIN 26.0 program. The significance level of alpha was .05.

Results: Male participants in rescue-firefighting duties participated, and worked as firefighters for an average of 13.57 years. There were significant differences between pretest and posttest findings on optimism ($t=2.60$, $p=.016$), problem-focused coping ($t=2.51$, $p=.019$), and deliberate rumination ($t=2.32$, $p=.029$). It indicated that the experimental group's optimism, problem-focused coping, and deliberate rumination significantly increased after participating in the expressive writing program.

Conclusion: The self-disclosure program using expressive writing is effective for firefighters with job-related traumatic events by developing positive psychological changes. It is advised that a chief fire officer should offer a self-disclosure program to help firefighters promote posttraumatic growth.

Keywords: Firefighters, Post-traumatic Growth, Coping, Rumination, Optimism

Introduction

Continuous exposure to potentially traumatizing events is common among the firefighters throughout their careers [1]. Exposure to a job-

related distressing incident was strongly related to negative physical and mental health consequences, such as poor psychological well-being and post-traumatic stress disorders [2]. In

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particular, firefighters reported significantly higher levels of post-traumatic stress disorder than lay persons [3].

The life-threatening events could lead to positive changes in cognitive and emotional well-being by allowing people to take a different perspective and reassess their priorities [4]. Posttraumatic growth (PTG), the propensity of individuals to evolve after traumatic situations in that they develop beyond their prior level of psychological functioning, is the term used to describe these considerable positive improvements [4, 5]. PTG was not generated by the trauma but by the people struggling with threatening events. PTG is a consequence of purposeful rumination, and meaning-making to understand a traumatic experience rather than a direct result of the trauma itself [5, 6].

A written emotional disclosure can be theorized as crucial for recovery from traumatic events [4, 5]. A meta-analysis on expressive writing about traumatic events is beneficial to promote physical and psychological health outcomes, and better health-related quality of life [7]. Expressive writing, including journal and poetry therapy, is a brief intervention allowing people to write about their feelings, and thoughts on an emotionally salient topic [8, 9]. To date, previous literature on emotional disclosure interventions to promote PTG has focused on cancer survivors [10], breast cancer patients [11], and veterans after traumatic events [12]. Contrary to cancer patients and laypeople, firefighters have experienced negative job-related traumas continuously during their professional lives. For this reason, encouraging PTG programs such a quick and simple expressive writing intervention should be created and researched. Firefighters are at high risk for psychological health problems because they continuously exposed to job-related traumatizing incidents via their entire careers [1]. Therefore, psychological interventions should be needed considering their job characteristics. This study aimed to examine whether a self-disclosure program using expressive writing would effectively promote optimism, problem-focused coping, rumination, and PTG in firefighters after traumatic events.

Materials and Methods

The one-group pretest-posttest design was used, which was a comparison between the pretest and posttest scores of experimental group. The target population for this study consisted of firefighters in Korea, and a convenience sample of firefighters was recruited from five fire stations in Changwon city, Gyeongnam Province, in 2018. Participants

had to meet the following requirements in order to be eligible: first, they had to be between the ages of 19 and 60; second, they had to have performed rescue-related firefighting duties; and third, they had to have gone through work-related traumatic incidents in the previous 12 months, such as seeing someone get hurt or killed; seeing a dead body; or failing to save people from a fire. Firefighters could be excluded if diagnosed with depressive disorder, post-traumatic stress disorder, anxiety disorders, and other mental disorders. Before providing a self-disclosure program, a pre-screening assessment was conducted, and participants reported whether they had a mental illness, such as depressive disorder, post-traumatic stress disorder, anxiety disorders, and other mental disorders.

The sample size was estimated using G*power program. For a determination of sample size, we input the value of significance level (α) of .05, the power ($1-\beta$) of .80, a one-sided independent t-test, and a medium effect size (d) of .50. It indicated that we needed a total of 27 participants. Allowing for attrition, we recruited 28 people for the study. Three participants withdrew from our program in terms of the voluntary discontinuation of participation in the expressive writing program. A total of 25 data were analyzed.

The research procedure to develop a self-disclosure program using expressive writing was the following. According to Calhoun and Tedeschi [4], people who have experienced traumatic events initially experience intrusive ruminations characterized by unwanted images and negative thoughts that become lodged in the mind. Intrusive rumination plays a crucial role in PTG, as it encourages deliberate rumination to reconstruct the pre-traumatic schema as intrusive thoughts and images gradually diminish. Reflective rumination helps gain insight into the meaning of life by understanding and reconstructing trauma [4, 5]. The transition from intrusive to deliberate rumination promotes post-traumatic growth, and self-disclosure through writing and dialogue about stressful events plays an important role in this process [4, 5].

Expressive writing often consists of three to five 20-minute writing sessions. It is intended to express one's innermost emotions and ideas [8]. In this research, firemen participated in a self-disclosure program that used expressive writing over the course of four 90-minute sessions to aid in their posttraumatic development. Based on the procedure described by Pennebaker [8], the intervention was designed to four themes, including the first session (searching deepest feelings and thoughts), the second session

(viewing emotional wounds), the third session (healing from emotional wounds), and fourth session (setting new life goals). In the first and second sessions of the first day's healing camp, participants were encouraged to write about their deepest feelings and thoughts about job-related traumatic events, such as witnessing a person getting hurt, seeing a dead body, and being unable to rescue people from fire. Grammar and spelling were not to be worried about, they were told. We invited participants to write about the many emotions and changes they had before suffering, after suffering, during, and now during the third session of the healing camp on the second day. After showing their emotional wounds, participants were encouraged to write positive thoughts and feelings in relation to their fire-fighting duties. In the fourth session, participants were asked to write new personal and professional goals that would help bring new meaning to one's life.

Life Orientation Test-Revised (LOT-R) [13] was a 10-item self-report questionnaire that is a continuous measure of optimism and pessimism. This instrument was translated into Korean and standardized by Shin [14]. Among ten items, three measured optimism, three measured pessimism, and four served as fillers. Responses were made on a 5-point Likert scale (0=strongly disagree, 1 = disagree, 2 = neutral, 3 = agree, and 4=strongly agree). Three pessimism items were reverse-scored, and the filler items were not to be included in the scoring. Higher scores indicated higher levels of optimism. Cronbach's alpha value of LOT-R was .78 for Scheier et al. [13], .72 for Shin [14], and .83 for this study. The Brief COPE [15], translated into Korean by Yang and Ha [16], was used in this study. This test measured a person's usage of coping methods over the previous three months and consisted of a 28-item self-report questionnaire. Six of the 28 items, including a 2-item measure of active coping, a 2-item measure of planning, and a 2-item measure of positive reframing, were utilized in this research to examine problem-focused coping. Respondents rated each item on a 4-point Likert scale ranging from 1 (I have not been doing this at all) to 4 (I have been doing this a lot). Higher scores indicated a greater tendency to use problem-focused coping strategies for traumatic experiences. Cronbach's alpha value of the Brief COPE was .68 for Carver [15], .85 for Yang and Ha [16], and .91 for this study. Event-Related Rumination Inventory (ERRI) [17], translated into Korean and standardized by Ahn et al. [18], was used in this study. Rumination in two distinct forms, including intrusive thoughts and intentional rumination, was the focus of this test.

Each item received two responses from respondents, one based on their thoughts immediately after the occurrence and the other based on their thoughts more recently. This instrument was a 20-item self-report questionnaire 10 items were chosen for each of two rumination styles. Respondents rated the degree to which the thoughts occurred during a specified time frame on a 4-point Likert scale (0=not at all, 1=rarely, 2=sometimes, to 3=often). Higher scores for two separate styles indicated a greater tendency to engage in each rumination style. Cronbach's alpha value of the intrusive rumination was .88 for Cann et al. [17], .93 for Ahn et al. [18], .90 for this study. The Cronbach's alpha value of the deliberate rumination was .94 for Cann et al. [17], .93 for Ahn et al. [18], .92 for this study. The Posttraumatic Growth Inventory's Korean adaptation [19] assessed beneficial changes brought on by the upsetting event. A 16-item self-report questionnaire has four subscales: a self-perceived change subscale (6 items), a deeper relationships subscale (5 items), a finding new possibilities subscale (3 items), and a spiritual change subscale (2 items). Responses were made on a 6-point Likert scale (0 = no change, 1 = a very small degree of change, 2 = a small degree of change, 3 = a moderate degree of change, 4 = a great degree of change, and 5 = a very great degree of change), where higher scores indicated more positive changes after traumatic events. Based on the systematic reviews, 60% of the highest score of each item were categorized as a moderate and high level of PTG. Cronbach's alpha value of the Korean version of posttraumatic growth was .90 for Song et al. [19] and .94 for this study.

The survey was done before and after the program's conclusion by a research assistant who was a nurse with 10 years of clinical experience. The research assistant was given instructions on how to complete a survey in order to reduce mistake. After obtaining ethical approval (IRB No. GIRB-A18-Y), the aims and procedures of study were explained to the participants. Each participant was informed that their participation was voluntary, given information about confidentiality, and free to withdraw from the research at any time without any loss of benefits.

The collected data were analyzed using the SPSS/WIN 26.0 program. The assumptions of normality were evaluated by skewness, kurtosis, and the Shapiro-Wilk test. The effects of the program on optimism, problem-focused coping, rumination, and posttraumatic growth were conducted using paired t-tests.

Results

The participants' average age was 40.00±10.21, and 76.0% of them were married (Table 1). Only 24% of the participants had a chronic illness, and 72% of individuals had completed college. Approximately 88.0% of participants said they were in good or moderate health. In the subjective economic status, 76.0% of participants answered 'middle.' The participants held the position of fire

lieutenant (36.0%), followed by fire sergeant (24.0%) and firefighter (24.0%). They worked as firefighters for an average of 13.57±10.05 years. The participants were represented in fire suppression division (36.0%), followed by the rescue division (32.0%) and the administration division (32.0%). The incidence of low-level PTG was 68.0%, and moderate-to-high level PTG was 32.0%.

Table 1. General and job-related characteristics of participants in Changwon city in 2018 (N=25)

Characteristics	Categories	n(%)
Age	20~40 years old	13(52.0)
	41~60 years old	12(48.0)
	M±SD	40.00±10.21
Marital status	Married	19(76.0)
	Single	6(24.0)
Educational level	High school	7(28.0)
	Over college	18(72.0)
Diagnosis of chronic disease	Yes	6(24.0)
	No	19(76.0)
Subjective health status	Unhealthy	3(12.0)
	Moderate	7(28.0)
	Healthy	15(60.0)
Subjective economic status	Low	4(16.0)
	Middle	19(76.0)
	High	2(8.0)
Levels of posttraumatic growth	Low level	17(68.0)
	Moderate-to-high level	8(32.0)
Position	Firefighter	6(24.0)
	Senior firefighter	4(16.0)
	Fire sergeant	6(24.0)
	Fire lieutenant	9(36.0)
Total years of working	M±SD	13.57±10.05
Types of tasks	Fire suppression	9(36.0)
	Rescue	8(32.0)
	Administration	8(32.0)

The effects of program on optimism, problem-focused coping, rumination, and posttraumatic growth were shown (Table 2). There were statistically significant differences on optimism (t=2.60, p=.016), problem-focused coping (t=2.51, p=.019) and deliberate rumination (t=2.32, p=.029). Our findings show that after taking part in the

expressive writing program, the experimental group's optimism, problem-focused coping, and purposeful ruminating dramatically rose. Contrarily, there were no significant variations in the results of the intrusive rumination (t=-0.54, p=.593) and posttraumatic growth (t=0.48, p=.638) tests between the pretest and posttest.

Table 2. Comparing the mean score of optimism, problem-focused coping, rumination, and posttraumatic growth before and after a self-disclosure program using expressive writing in Korean firefighters in 2018 (N=25)

Variables	Range	Before the intervention	After the intervention	t (p)*
		M±SD	M±SD	
Optimism	0-4	2.53±0.58	2.75±0.53	2.60(.016)
Problem-focused coping	1-4	2.27±0.61	2.52±0.48	2.51(.019)
Intrusive rumination	0-3	0.52±0.48	0.48±0.48	0.54(.593)
Deliberate rumination	0-3	0.60±0.59	0.86±0.51	2.32(.029)
Posttraumatic growth	0-5	2.53±0.87	2.61±0.76	0.48(.638)

* Paired t-tests

Discussion

Frequently struggling with major life crises may lead to the phenomenon of personal growth worldwide [20]. This research offers important evidence that the expressive writing self-disclosure program on firefighters' posttraumatic development is successful by promoting employees' optimism, problem-focused coping, and purposeful rumination. Considering the prevalence of posttraumatic stress symptoms, and job-related trauma in firefighters is higher than in other working populations [4], developing and implementing a self-disclosure program using expressive writing to stimulate PTG is meaningful. The key finding in this study is that the deliberate rumination of experimental group significantly increased after participating in the self-disclosure program. This is in line with previous findings of PTG intervention that reflective and effortful rumination has shown significant increases after disclosure [4, 5]. It's likely that by sharing their works, firemen may be able to lessen the first mental discomfort brought on by the shock. Self-disclosure, as the PTG model proposes, may also provide an opportunity to reevaluate life objectives or write a meaningful story [4, 5]. Writing about their stressful experiences may directly solve the problem, or it may provide comfort in a situation that cannot be changed [7, 9, 21]. Such a cognitive process for purposefully thinking about incidents is key to constructing the worldview and developing positive life changes [4, 5]. Traumatic incidents often force people to ruminate, in which one's disclosure about their experiences via the expressive writing can foster qualitative changes in the cognitive process. Through the cognitive process involving reflective and constructive thoughts, firefighters could interpret the traumatic event as a growth experience.

As expected, this research found that problem-focused coping dramatically increased in the experimental group. This result is consistent with other studies that showed a considerable increase in problem-focused coping techniques after self-disclosure [16, 22]. Coping strategies promoting effortful engagement through self-disclosure would positively relate to PTG in firefighters [23]. Disclosing with expressive writing help firefighters use problem-focused coping strategies, such as focusing on the issue, positive reinterpretation, and establishing plans after experiencing a traumatic incident, which can lead to a higher level of PTG and narrative development [21].

Our results showed that the experimental group's optimism greatly rose. Given that people who are optimistic are more likely to adopt problem-focused

coping mechanisms, which lead to high levels of PTG, a self-disclosure program involving expressive writing for boosting PTG may be appropriate [24]. The self-disclosure intervention using expressive writing to stimulate PTG of firefighters could be an effective strategy for workers and employers because this study is meant to inform employee assistance programs to promote PTG in firefighters. Thus, the self-disclosure program using expressive writing should be disseminated for firefighters struggling with job-related traumatic incidents.

The strength of this study is that our study adds to the growing literature on disclosure programs to improve PTG. The effects of the self-disclosure program for firefighters' PTG, which may be used in fire stations and municipal fire departments, were first examined in this research. Despite the importance of this study, a few potential shortcomings need to be mentioned. First, findings of the main outcomes may not be generalizable to all firefighters in terms of a small convenience sample of a relatively homogenous group of workers. Another limitation is that there may have been a selection bias, as participants were voluntary and more likely to be motivated to use deliberate rumination and problem-focused coping. Moreover, a within-subjects design to test interventions without a control group is another limitation of our study.

Some suggestions can be made based on the study findings. First, future studies should be conducted on firefighters working in urban cities and rural areas to confirm the effects of PTG-based self-disclosure programs using expressive writing. Second, a randomized controlled trial design using a larger number of participants should be needed to minimize confounding, and avoid threats to internal validity. Third, as the longevity of our promising results is uncertain, the long-term impacts of the self-disclosure intervention utilizing expressive writing should be taken into account. To ascertain the duration of an expressive writing self-disclosure program's positive effects on PTG, more research is required.

Conclusion

This study aimed to develop a self-disclosure program using the expressive writing to improve positive psychological changes in firefighters, and then to examine the program's effects. The self-disclosure program using expressive writing effectively encourages optimism, problem-focused coping, and deliberate rumination for firefighters after job-related traumatic events. The results show that the PTG-based expressive writing self-

disclosure program is successful and workable in a professional environment. A chief fire officer should provide the self-disclosure program to assist firefighters who are going through stressful experiences at work and enhance organizational effectiveness.

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