Effect of Small Group Crisis Intervention (Defusing) on Negative Affect and Agreeableness to Seeking Mental Health Services

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This investigation analyzed the impacts of traumatic incidents and the effects of a small group intervention on full-time fire/rescue professionals. Data were collected on three cohorts of participants: trauma-exposed participants who requested a small group intervention ($N = 255$), nontrauma-exposed participants ($N = 147$), and trauma-exposed participants who received no intervention and were assessed 3 days after a trauma ($N = 34$). The current mood states of all participants were measured with the Multiple Adjective Affect Check List, Revised. The small group intervention significantly lowered the composite negative affect score, whether compared to the preintervention score or the trauma-exposed group who were 3 days distant from the trauma but had received no intervention. Postintervention fire/rescue professionals agreed they were more likely to seek out future mental health services (two and half times) and future small group interventions (two times). [Brief Treatment and Crisis Intervention 6:308–315 (2006)]

KEY WORDS: firefighters, mental health, small group intervention, trauma, stress.

Introduction

The fire/rescue profession is one of the most stress-exposed occupations. There were approximately one million firefighters responding to more than 22 million calls for service in 2004 (National Fire Protection Association, 2004). There are few incidents involving serious injury or death that occur in this country without fire/rescue professionals being on scene. These professionals serve not only in the capacity of suppressing fires but also as emergency, medical professionals, rendering prehospital medical care and transportation until the patient arrives at the next level of care [Medical Telecommunications and Transport, State of Florida Statutes, 2006].

The opportunity for the development of trauma-related pathology is staggering. Fire/rescue professionals experience the negative behavioral effects of trauma (i.e., domestic violence, divorce, substance abuse) at rates higher than the general population (Myers, 2001), and some studies suggest that firefighters have higher rates of posttraumatic stress disorder (PTSD) than even Vietnam veterans (Corneil, Beaton, Murphy, Johnson, & Pike, 1999). Combine these problems with the low probability...
that fire/rescue professionals seek mental health services (Smith, 2000) and the difficulties are exacerbated and may become chronic.

This investigation followed suggestions of the National Institute of Mental Health (2002) that states:

the scientific community has an obligation to examine the relative effectiveness of early interventions that seek to reduce adverse outcomes and foster positive adaptations following mass violence and disasters... There is an ethical duty to conduct scientifically valid research to improve prevention, assessment, intervention, and treatment... These systematic evaluation activities should be planned and carried out in conjunction with identified bodies that are responsible for organizing and delivering early interventions following mass violence and disasters. (p. 10)

This research study addresses three questions:

1. Will the small group intervention change the level of negative affect?
2. Will the small group intervention change participants' agreeableness to seek mental health services in response to the stresses of the profession?
3. Will the small group intervention change participants' agreeableness to seek future small group interventions in response to the stresses of the profession?

Methodology

Participants

All participants were paid, full-time fire/rescue professionals with a South Florida agency/department. Participants were certified in both fire suppression (State of Florida minimum standards course, a 440-hr curriculum) and emergency medical services (Emergency Medical Technician—Basic, EMTB, or Emergency Medical Technician—Paramedic, EMTP, standard according to the Department of Transportation, DOT). The trauma-exposed participants requested a small group intervention and received the intervention from the Broward County Critical Incident Stress Management (CISM) team, Region X, State of Florida. All members of this team have attended the International Critical Incident Stress Foundation’s Group course and were mentored through several interventions before they were permitted to be a full member of the team. For this study, 34 small group interventions were conducted over a 2-year period.

Measures

The State Version of the Multiple Adjective Affect Checklist, Revised (MAACL-R), is an objective instrument used to measure the state mood as opposed to trait mood. State refers to “short-term mood or mood change” (Lubin & Zuckerman, 1999, p. 1). The MAACL-R has 132 adjectives, and participants are asked to identify the adjectives that express how they are feeling “right at that moment.” The instrument requires approximately 5 min to complete. For this study, four subscale scores were analyzed: anxiety (A), depression (D), hostility (H), and a composite score for negative affect, dysphoria (Dys).

The State form has good reliability (Lubin & Zuckerman, 1999) with a Cronbach’s $\alpha$ of .81 for the Dys in the population of adolescents, Air Force recruits, college students, and community college students with whom the MAACL-R was standardized and normed. The scales of the State MAACL-R show good convergent validity with the State Trait Personality Inventory (Spielberger, 1980), Affect Balance Scale (Bradburn, 1969), and Positive Affect and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988).
Participants also responded to a demographic questionnaire answering questions such as age, gender, and years of experience. Participants also completed two surveys, one at the beginning and a second at the conclusion. The surveys are set up in parallel. The survey instrument asked them to indicate (on a five-point Likert scale) their agreeableness to seeking mental health services and future small group interventions.

**Procedure**

Any member of a crew or company may request the small group intervention at his or her own discretion. Personnel participated in the small group intervention at their station house during their shift. Once a small group intervention was requested, all members of the crew or company typically participate, as is the profession’s tradition. Participation in the research was anonymous, and the small group intervention was performed regardless of each individual’s participation in the research.

This research project investigated one intervention of the CISM protocol, the Defusing. Mitchell (1983) first proposed the concept of crisis intervention in a formal structured way to emergency and first responders. The Defusing (Mitchell & Everly, 1997, p. 121–131) is composed of three parts: Introduction, Exploration, and Information. First, rules and guidelines for the orderly exchange of ideas and the smooth running of the group are discussed. Then a single question is asked: “What happened on the scene?” Lastly, participants are given information for monitoring the signs of stress in themselves as well as their coworkers. All interventions were performed with a Florida licensed mental health practitioner and small group intervention-trained fire/rescue peer personnel. There was variability both among team members (at least eight different fire/rescue peer team members) and among mental health practitioners (three) who participated in the collection of this research within the course of the 2 years.

The nontrauma-exposed fire/rescue professionals had not requested a small group intervention on the shift during which data were gathered and presumably had not recently experienced a particularly traumatic call requiring the assistance of the local CISM team. The nontrauma-exposed group completed a Demographic Sheet and an instrument (MAACL-R). The third group of professionals (Trauma + 3) had experienced a particularly traumatic/critical stressor 3 days before completing the research materials and participating in this research study. This group, too, completed a Demographic Sheet and an instrument.

The investigator verbally requested participant’s permission to gather data for the research. Those who volunteered were asked to read and review the cover letter that served as anonymous consent. Next, participants completed the MAACL-R, State Version, and a supplemental survey instrument. Following completion of these instruments, participants underwent the small group intervention. Immediately after the intervention, participants completed a second MAACL-R, State Version, and a supplemental survey. Individual follow-up then occurred to confirm that participants were emotionally fit to leave. The entire process, including the small group intervention and completed research materials, lasted approximately 60 min for each intervention.

A one-tail, independent-sample $t$ test was used to compare the preintervention negative affect composite score (Dys) for the trauma-exposed group to the nontrauma-exposed group and to compare the postintervention Dys scores for the trauma-exposed group to the Dys scores for the Trauma + 3 group. For the trauma-exposed group, the effects of the small group intervention on Dys were tested using analysis of variance (ANOVA) with repeated measures.
A two-way contingency table analysis was conducted to evaluate whether the distribution of preintervention agreeableness to seeking future mental health services or future small group interventions was equal to the distribution of postintervention agreeableness (with $\chi^2$ being used as the test statistic).

### Results

A majority of participants were male (see Table 1). Sixty-six percent ($N = 255$) of the participants had children, and 71% ($N = 171$) were married or previously married. Almost 30% ($N = 73$) of the sample was ethnic minorities, which is representative of the population of fire/rescue professionals; however, in this sample, minorities were more likely to be Hispanic/Latin (19%) than African American (4%). The mean age of participants was 36 (see Table 2), and they had almost 3 years of college, which is the approximate level of education required to be a paramedic (EMTP). Participants had over a decade of experience in the profession.
and almost all of those years were with the current agency ($M = 9.75$). An unexpectedly high proportion (28%, $N = 72$) responded that they or someone in their family had utilized mental health services. Also, a relatively high proportion of respondents reported participation in a previous small group intervention (42%, $N = 108$).

**Higher Negative Affect After Traumatic Event**

A one-tail, independent-sample $t$ test was conducted to evaluate the hypothesis that the pre-intervention composite negative affect score (Dys) was higher for the trauma-exposed participants than for the nontrauma-exposed ones. Negative affect was significantly higher for the trauma-exposed group (see Table 3), but the effect size was small. For trauma-exposed participants, mean Dys was approximately one quarter of a standard deviation higher than the mean for participants with no trauma exposure. The $\eta^2$ indicated that only 1% of the variance in negative affect was accounted for by trauma exposure.

**Moderate Decline in Negative Affect After Defusing**

A one-way within-subjects ANOVA was conducted to evaluate the effect of the small group intervention on dysphoria (Dys) scores. The within-subjects factor was the intervention with two levels (pretest and posttest). The main intervention effect was significant ($F(1, 254) = 63.64, p < .001, \eta^2 = .20$). The effect size of the intervention on negative affect was moderate with mean Dys scores falling nearly half a standard deviation (see Table 4). Effect size as measured by $\eta^2$ was also moderate, with 20% of the variation in Dys attributed to the small group intervention.

Having demonstrated a significant effect of the intervention on composite negative affect, Dys, the next step was to investigate which components of Dys were responsible for the effect. A follow-up multivariate repeated measures ANOVA on anxiety, depression, and hostility was conducted. The main intervention effect was significant for all three components (see Table 5)—depression: $F(1, 254) = 15.53, p \leq .006, \eta^2 = .08$; hostility: $F(1, 254) = 47.20, p \leq .001, \eta^2 = .16$; and anxiety: $F(1, 254) = 22.97, p \leq .001, \eta^2 = .08$. The effect size was small for all subscales with the mean score falling between one third of a standard deviation (hostility and anxiety) and one quarter of a standard deviation (depression). As measured

### TABLE 3. Group Differences for Standardized MAACL-R Composite Score Between Nontrauma-Exposed Participants and Pretest Scores for Trauma-Exposed Participants

<table>
<thead>
<tr>
<th></th>
<th>Nontrauma exposed</th>
<th>Trauma exposed</th>
<th>$t$ (324)</th>
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<tbody>
<tr>
<td>$M$</td>
<td>1.21</td>
<td>1.91</td>
<td>2.16*</td>
</tr>
<tr>
<td>$SD$</td>
<td>2.25</td>
<td>2.45</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$.

### TABLE 4. Means and Standard Errors for Negative Affect (Dys)

<table>
<thead>
<tr>
<th>Stage</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preintervention</td>
<td>1.91</td>
<td>0.094</td>
</tr>
<tr>
<td>Postintervention</td>
<td>0.99</td>
<td>1.76</td>
</tr>
</tbody>
</table>

### TABLE 5. Estimated Marginal Standardized Means and Standard Errors for Negative Affect Subscores

<table>
<thead>
<tr>
<th>Measure</th>
<th>Stage</th>
<th>$M$</th>
<th>$SE$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Preintervention</td>
<td>0.40</td>
<td>0.051</td>
</tr>
<tr>
<td></td>
<td>Postintervention</td>
<td>0.20</td>
<td>0.034</td>
</tr>
<tr>
<td>Depression</td>
<td>Preintervention</td>
<td>0.55</td>
<td>0.056</td>
</tr>
<tr>
<td></td>
<td>Postintervention</td>
<td>0.34</td>
<td>0.046</td>
</tr>
<tr>
<td>Hostility</td>
<td>Preintervention</td>
<td>0.96</td>
<td>0.096</td>
</tr>
<tr>
<td></td>
<td>Postintervention</td>
<td>0.44</td>
<td>0.064</td>
</tr>
</tbody>
</table>
by $\eta^2$, the effect size was also small with only 8%–16% of the variation in the subscores attributed to the small group intervention.

**Higher Decline in Negative Affect Than Could Be Accounted for by Time Alone**

A one-tail, independent-sample $t$ test was conducted to evaluate the hypothesis that the mean postintervention Dys score was lower for the small group intervention cohorts than for the Trauma + 3 cohorts who are a proxy for the “healing” effect of time alone. The test was significant (see Table 6), indicating that the small group intervention had a larger effect on Dys than could be accounted for by the effect of time alone. Mean negative affect scores were approximately three times higher for the Trauma + 3 group that was 3 days removed from the traumatic event than for the group that received the small group intervention.

**Significantly Increased Agreeableness to Seeking Services**

A two-way contingency table analysis (see Table 7) was conducted to evaluate whether fire/rescue professionals were more agreeable to the possibility of seeking mental health services in the future after participating in the small group intervention. Willingness to seek mental health services in the future significantly increased, Pearson $\chi^2(4, N = 432) = 19.15, p = .001$. The proportion agreeing that they may seek mental health services in the future went from 8% to 20%, and the proportion strongly disagreeing fell from 36% to 22%.

A two-way contingency table analysis (see Table 8) was conducted to evaluate whether fire/rescue professionals were more agreeable to seeking a future small group interventions after participating in this intervention. Willingness to seek small group intervention in the future significantly increased, Pearson $\chi^2(4, N = 432) = 32.99, p < .001$. The proportion agreeing or strongly agreeing that they may seek a small group intervention in the future went from 35% to 62%, and the proportion that were uncertain fell from 47% to 24%.

**Discussion**

**Implications for Practice**

Seventy-five percent of the participants described the day of the research (the call that precipitated the small group intervention) as “traumatic.” The findings of this study suggest that small group interventions reduce negative affect as measured by the MAACL-R and the reduction cannot be attributed to the effect of time alone. Although statistically significant,
the effect of the small group intervention on negative affect was modest, accounting for 20% of the variation in negative affect scores. Nonetheless, this improvement in negative affect is important considering that it is based on only a 1-hr intervention within 3 hr of the event and considering the magnitude of the need for this beleaguered group of emergency workers. Although this study provides evidence that negative affect associated with trauma can be reduced, it does not imply that the small group intervention can have long-term effects or reduce either PTSD or Acute Stress Disorder per se. Perhaps more important for their long-term health, the small group intervention significantly increased their agreeableness to seek both small group interventions and mental health services in the future. The literature suggests that fire/rescue professionals have abnormal amounts of divorce, domestic violence, substance abuse, and suicide (Myers, 2001). So, if these negative outcomes for the fire/rescue profession could be even modestly reduced, the quality of the fire/rescue service could improve. If the health and safety of the fire/rescue service can be improved, then society and the final recipients of these services, the general public, are better served by these public servants.

**Limitations of the Present Study**

This sample may not be representative of fire/rescue professionals nationally because there were more males, more Hispanic/Latinos, and, perhaps, more exposure to mental health services and prior CISM interventions. Also, the external validity of this study is limited because it used a convenience sample not a random sample.

The MAACL-R may not have been precise enough or comprehensive enough to measure all the components of affect that are effected by the intervention. The length and complexity of the instrument, 132 words, may also have “turned off” and “burned out” some individuals participating in this research.

**Acknowledgments**

Conflict of Interest: None declared.

**References**


