

Experimental Evaluation of DEFUSE: Online De-escalation Training for
Law Enforcement Intervening in Mental Health Crises

by

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ABSTRACT

Training for law enforcement on effective ways of intervening in mental health crises is limited. What is available tends to be costly for implementation, labor-intensive, and requires officers to opt-in. DEFUSE, an interactive online training program, was specifically developed to train law enforcement on mental illness and de-escalation skills. Derived from a stress inoculation framework, the curriculum provides education, skills training, and rehearsal; it is brief, cost-effective, and scalable to officers across the country. Participants were randomly assigned to either the experimental or delayed treatment control conditions. A multivariate analysis of variance yielded a significant treatment-by-repeated-measures interaction and univariate analyses confirmed improvement on all of the measures (e.g., empathy, stigma, self-efficacy, behavioral outcomes, knowledge). Replication dependent t-test analyses conducted on the control condition following completion of DEFUSE confirmed significant improvement on four of the measures and marginal significance on the fifth. Participant responses to BPAD video vignettes revealed significant differences in objective behavioral proficiency for those participants who completed the online course. DEFUSE is a powerful tool for training law enforcement on mental illness and effective strategies for intervening in mental health crises. Considerations for future study are discussed.

DEDICATION

To Spencer, a true partner. I would not be where I am today without your confidence in me. Thank you for your patience, your understanding, and for your delicious meals which kept me fueled. Thank you for supporting my professional passions, helping me turn my closet into a recording studio, and being a reprieve when I needed it most. I dedicate this to you for walking with me through each and every step of this project. To never having to dissertate again!

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To law enforcement, may DEFUSE be another tool to keep you safe. Thank you for the sacrifices you make each day.

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Rationale

To serve and protect are the commonly accepted roles of law enforcement within the United States. These generic responsibilities include a vast array of specific duties: to prevent dangerous driving, to respond in times of crisis, to solve heinous crimes, to stop violence, to suppress the sale of narcotics, and to generally maintain a safe environment. Identifying subjects with mental illness has historically not been included, but all too often mental illness is comorbid with criminal justice involvement.

Indeed, police contact with the mentally ill regularly occurs as a result of professional regulation as well as by chance. Mental health providers are mandated by law and required by their ethics codes (e.g., American Psychological Association, American Counseling Association, American Psychiatric Association) to disclose when a patient has planfully threatened serious harm against themselves or others. Thus, law enforcement may be notified and asked to respond to a mental health crisis. Historically, 7 percent of all police contacts in US cities with more than 100,000 people have involved an individual with mental illness (Deane, Steadman, Borum, Veysey, & Morrissey, 1999). A more recent study indicates that in 33% of all calls mental illness was the primary contact reason (Tinney & Rosenbaum, 2015). In the previous month, the percentage of officers responding to at least one call involving a subject with mental illness ranged from 59.5% to as high as 92% (Borum, Dean, Steadman & Morrissey, 1998; Gillig, Dumaine, Stammer, Hillard, & Grubb, 1990). Clearly, interacting with mentally ill individuals is a regular occurrence for law enforcement officers.

As a result, correctional facilities have become the first line of treatment for many individuals with mental illness (James & Glaze, 2006; Shufelt & Coccozza, 2006). In the

United States, 64% of jail inmates, 56% of state inmates, and 45% of federal inmates have a mental health problem (James & Glaze, 2006). In the rest of the population this percentage drops to 17.8% (Substance Abuse and Mental Health Services Administration, 2013). Mental illness among incarcerated individuals vastly out numbers the rest of the population.

Law enforcement officers are frequently the first professionals to interact with individuals violating the law and struggling with symptoms of mental illness. They have a great deal of discretion in determining how to handle calls while on duty; officers determine whether to offer a warning, to ticket, or to arrest. Thus, they have the opportunity to make a momentous difference in the lives of these individuals. Focusing on the criminal components of substance use and mental illness ignores the real problems: poor coping strategies to manage emotional distress, disproportionate access to services within our country, unhealthy relationships, and unsupportive environments. Yet former inmates indicate that these issues are often further exacerbated by incarceration (e.g., Haney, 2002). If given the appropriate training to recognize symptoms of mental illness and skills to effectively intervene, law enforcement can divert individuals into treatment rather than the criminal justice system or opting to do nothing (Teller, Munetz, Gil, & Ritter, 2006).

Despite the huge numbers of incarcerated people meeting criteria for a mental health diagnosis, law enforcement and correctional staff do not receive adequate training on how to effectively handle interactions with the mentally ill. Forty-five thousand recruits begin law enforcement basic training each year according to the Bureau of Justice Statistics (BJS) of the U.S. Department of Justice (Reaves, 2016). These recruits

are trained in 664 different state and local law enforcement academies across each of the United States of America. The BJS data spans academies for State Police Officer Standards and Training (POST), state police, highway patrol, sheriff's offices, county police, municipal police, 2 and 4-year college/university academies, technical schools, special jurisdiction and multi-agency/regional academies; the data excludes academies only providing in-service, corrections/detention, or other specialized training. On average, law enforcement recruits receive 21 weeks, or 840 hours, of training, an increase of about 2 weeks since the last BJS report (Reaves, 2009) but still significantly less than what is required for a barber at 900 hours or a cosmetologist at 1500 hours of training. The 2009 BJS report indicated that recruits received an average of 123 hours of training dedicated to weapons/self-defense whereas the topic of mental illness was not covered nor asked about in the survey for data collection. The 2016 BJS update indicates that the average hours of training on weapons/defensive tactics/use of force increased to 168 hours, and 95-percent of academies now offer some training on mental illness. It is unclear what this encompasses, however, as only a single yes/no item was used to capture this information on the survey. Arguably, new recruits are still best trained to save their lives through force.

One solution to offering training on mental illness post academy is the Crisis Intervention Team (CIT) model. Also known as the Memphis Model, it was developed in Memphis, TN in 1988 and has been adopted by many departments across the country. It now has a presence in all but three states: West Virginia, Arkansas, and Alabama (<http://cit.memphis.edu/citmap/>). As described by the founding collaborators (Dupont, Cochran, & Pillsbury, 2007, p.3) "CIT provides law enforcement-based crisis

intervention training for assisting those individuals with a mental illness and improves the safety of patrol officers, consumers, family members, and citizens within the community.”

The full CIT Model contains 10 elements: (1) Partnerships between the law enforcement, advocacy, and mental health communities; (2) Dedicated investment from community members in aspects including planning, implementation, & networking; (3) Policies and procedures to provide a set of guidelines directing all stakeholders; (4) CIT personnel, including officers, dispatchers, and various coordinators; (5) Curriculum for a 40-hour comprehensive training for patrol officers and specialized training for dispatch; (6) A designated Emergency Mental Health Receiving Facility; (7) Evaluation and Research; (8) In-Service training to provide CIT Officers with additional knowledge and skills; (9) Recognition and honors for CIT Officers who have demonstrated exceptional care and compassion while ensuring safety; (10) Outreach: Developing CIT in other communities.

One study evaluating the financial costs and benefits of implementing the CIT model, through analysis of actual dollars spent or saved, revealed that over one million dollars had been saved annually. CIT cost over \$2.4 million to implement for a year, but it led to over \$3.4 million in annual savings (El-Mallakh, Kiran, & El-Mallakh, 2014); much of the financial savings was seen in fewer admissions to hospitals, psychiatric facilities, and jails. The police department was responsible for much of the training costs, and these costs were not offset by their financial savings. Other research on the model indicates that CIT-trained officers, in comparison to untrained officers, show higher levels of persisting self-efficacy for encounters involving mentally ill subjects,

demonstrate greater knowledge about the topic, have increased recognition of appropriate referral decisions, and recognize effective strategies for de-escalation (Compton et al., 2014a). Another study comparing CIT trained officers to a group of non-CIT officers found that CIT status was not predictive of the use of force in self-reported encounters with subjects; however, CIT officers were more likely to report use of verbal engagement and negotiation techniques as subject demeanor became more resistant. CIT officers also had lower arrest rates and higher rates of transferring mentally ill subjects to treatment (Compton et al., 2014b). It is purported that CIT offers many benefits to law enforcement agencies and their communities.

Although a community may implement the CIT Model, departments generally do not require all officers to complete the 40-hour comprehensive mental health training, element number five. The designation of being a CIT officer is usually voluntary and left to the discretion of each individual officer. The voluntary aspect of CIT is “commonly considered a core element of the CIT model” (Compton et al., 2014a, p. 518); it is expected that participants who volunteer will be more motivated to engage productively with mentally ill subjects (Compton et al., 2014b). For officers who choose to participate, the national CIT curriculum contains didactics and lectures, on-site visits, scenario based practical skills training, and time for questions and answers.

Many officers, however, fail to recognize the benefit of gaining a greater understanding of mental illness, despite the prevalence of calls involving the mentally ill and the personal impact of job stress. Furthermore, many law enforcement agencies do not have the necessary resources to implement this initiative, or such training alone, due to rural location, department funding, and/or lack of buy-in from management (e.g.,

Compton et al., 2010). In many departments, obtaining training on mental illness is unavailable or self-driven implying that an understanding of mental illness is not needed to be an effective law enforcement officer. The topic was first surveyed and reported in 2016; therefore, it is unclear how many active officers have never had training on the topic. Furthermore, a consistent curriculum across departments is currently not available. Most commonly, the general curriculum topics may be the same, as is the case with CIT training; however, the specific content and teaching modalities vary across academies, cohorts of learners, and instructors.

The current study evaluated one potential solution to bridging the gap in training for law enforcement officers intervening in mental health crises: DEFUSE. To date, no other intervention specifically developed for law enforcement and providing a curriculum on mental illness and de-escalation has been evaluated through a randomized controlled trial. DEFUSE is an interactive online training program specifically developed for law enforcement. It was organized within a classic stress inoculation framework, offering education, skills training, and rehearsal (Meichenbaum & Deffenbacher, 1988). This framework has previously been applied and shown successful with law students and nurses (Sheehy & Horan, 2004; Jones West, Horan & Games, 1984). Classic law school curricula are reportedly the most stressful of all graduate training programs, and acute care nurses face horrific injuries, perform CPR, and must tell parents their child has died. Law enforcement face similar daily stressors but also the ever-present reality of possible injury or death. It is clear their jobs also involve high levels of stress (Abdollahi, 2002). Figure 1 (see Appendix A) provides an overview of the components of DEFUSE framed within the stress inoculation model. The image further provides a logic map from

the stress inoculation model, to the learning objectives of DEFUSE, to the dependent variables of the experiment.

In two hours DEFUSE teaches learners about mental illness and effective de-escalation skills for defusing mental health crises. DEFUSE incorporates didactics, exposure to individuals with mental illness, and scenario based practical skills training. The curriculum was built to be brief, cost-effective and available to officers regardless of location and department resources. Given its online format, all learners receive the same information and delivery as they proceed through the course. Furthermore, the training can easily be required of all officers across the country, within a department, or an academy to alleviate concerns about factors affecting officer decisions to volunteer for mental health training (Compton, Broussard, Hankerson-Dyson, Kirshan, & Stewart-Hutto, 2011). This training structure ensures all officers are better equipped to respond to mental health crises as it is not always possible to send a specialized team.

The goal of the present study was to conduct an experimental evaluation of DEFUSE. Numerous benefits were anticipated following the completion of the training program: 1) increased empathy toward individuals with mental illness; 2) lowered levels of stigma toward mental illness; 3) improved self-efficacy about effectively handling mental health crises; 4) improved recognition of behavioral outcomes to benefit interactions with mentally ill subjects; 5) increased knowledge of mental illness and de-escalation strategies; and, 6) greater demonstration of de-escalation strategies.

Method

Participants

A national sample of twenty-four volunteers from 11 states (7 women and 17 men) ranging in age from 23 to 60 were randomly assigned to either DEFUSE training (M age = 34.92) or delayed treatment control conditions (M age = 39.92); 87.5 percent of the sample self-identified as Caucasian. Exclusion criteria included being under 21, a CIT trained officer, or a mental health professional. Twenty-one percent of participants worked in law-enforcement for 3 to 20 years. Participants were offered a \$25 Amazon Gift Card for their time. Further details about the sample can be found in Table 1 (see Appendix B).

Measures

All but one of the measures were administered through Qualtrics, an online survey software program. Participants accessed the measures and the DEFUSE online training program through the website www.DefuseSkills.com. The BPAD measure, described below, required participants to access a personalized link emailed directly to the participant by the host website. Demographic information was collected via a questionnaire and used for sample description as well as for screening purposes. To permit comparisons between CIT and DEFUSE training effects, measures used in the research literature on CIT were also used with DEFUSE; additional measures were included to establish whether DEFUSE produced additional effects. All measures, other than a satisfaction survey described below, were administered at pre and post-test.

CIT Measures. The CIT measures have all demonstrated good internal consistency and test-retest reliability as noted in prior studies (e.g., Bahora, Hanafi,

Chien, & Compton, 2008; Broussard et al., 2011; Compton, Esterberg, McGee, Kotwicki, & Oliva, 2006; Compton et al., 2014a).

The *Empathy Questionnaire* is an 11-item measure adapted from Levy, Freitas, and Salovey (2002). Two items are rated on an 11-point Likert-type scale ranging from *Not at All* to *Definitely So*. These items ask participants whether they have ever imagined how people with mental illness feel about having a mental illness and whether they have ever considered how living with a mental illness would affect their own life. The remaining items ask participants to indicate how much they feel nine different emotions (e.g., compassion, hostility) in relation to people with mental illness. Each of these items is rated on an 11-point Likert-type scale ranging from *Not at All* to *Extremely*. Negative emotions (e.g., disgust, hostility, suspicion) were reverse scored; therefore, higher scores indicate greater ability to empathize with individuals experiencing symptoms of mental illness. Pre-test internal consistency was high at .879 as was test-retest reliability calculated on the controls, $r = .837$, $n = 12$, $p = .001$.

Participants responded to the remaining CIT measures after reading a vignette scenario about someone with a serious mental illness. The vignette was developed by Broussard et al. (2011) and represented a real-world interaction commonly faced by on duty officers. The name of the individual in the vignette was changed to Jordan, from David, to make it more neutral in regard to gender and race.

The Adapted Social Distance Scale (ASDS), adapted from Bogardus (1925), is a 9-item self-report measure designed to assess participants' social distance, or stigma, toward individuals displaying symptoms of mental illness. Items are rated on a 4-point Likert-type scale ranging from *Very Unwilling* to *Very Willing*. Scores range from 9 to 36

with higher scores indicative of lower stigma or less social distance. Sample items include *Six months from now, when Jordan is not in crisis, how willing would you be to sit next to him/her on the bus?* and *Six months from now, when Jordan is not in crisis, how willing would you be to rent an apartment in your basement to him/her?* Pre-test internal consistency for the ASDS was high at .846; test-retest reliability calculated on the control subjects was also good, $r = .746$, $n = 12$, $p = .005$.

The Self-Efficacy Scale (SES), modified from Bahora et al. (2008), is a 16-item measure designed to assess participants' perceived ability to handle interactions with someone exhibiting symptoms of mental illness. Items are rated on a 4-point Likert-type scale ranging from *Not at all Confident* to *Very Confident*; scores range from 16 to 64 with higher scores indicative of greater confidence in interactions with someone displaying symptoms of mental illness. Sample items include *How confident would you feel in your ability to effectively communicate with someone like Jordan?* and *How confident would you feel in your ability to effectively de-escalate a mental health crisis involving someone like Jordan?* Pre-test internal consistency for the SES was excellent at .916 as was test-retest reliability calculated on the control subjects, $r = .905$, $n = 12$, $p = .000$.

The *Behavioral Outcomes Scale (BOS)* is a 16-item self-report measure developed to assess de-escalation and referral decisions, or reported behavioral outcomes. Eight items correspond to each construct. Items are rated on a 4-point Likert-type scale ranging from *Very Negative* to *Very Positive*; eight items required reverse scoring. Scores range from 4 to 64 with higher scores indicative of good de-escalation skills and positive referral decisions. Sample items include *Having your hand on your baton or gun when*

speaking with Jordan and Contacting a mobile crisis unit to take Jordan to a mental health facility. Consistent with prior studies (Broussard et al., 2011), reliability was not superior on this measure. Pre-test internal consistency for the full BOS was moderate at .627 as was test-retest reliability calculated on the control subjects, $r = .695$, $n = 12$, $p = .012$.

DEFUSE Measures. Mastery of the knowledge objective was assessed by an 18-item True/False *knowledge measure* consistent with the DEFUSE curriculum. Eight of the items assessed information derived from the module on symptoms of mental illness and recovery; the other 10 items tapped the six de-escalation skills taught in the second module of the training. Scores ranged from 0 to 18 with higher scores indicating greater knowledge of the measured content. Test-retest reliability calculated for the no treatment control subjects was moderate, $r = .629$, $n = 12$, $p = .028$.

The *Behavioral Personnel Assessment Device (BPAD)* was used to assess objective behavioral proficiency; this technology is generally used by law enforcement agencies to aid in hiring decisions of new recruits. Through BPAD participants role-played with six different video vignettes, three at pre-test and three at post-test, of subjects displaying symptoms of mental illness and escalation (e.g., infant death scene, potential suicide, mentally ill subject). Participants responded as if they were the officer on the scene; responses were captured through personal web cameras and confidentially stored by the host organization. Trained masters level independent judges rated each video response on the presence or absence of twenty-four DEFUSE competencies. Participant scores on each video vignette were the average number of competencies observed by the judges on each video; total scores at pre and post-testing reflected

summed scores for the three vignettes. Interrater reliability was excellent, $k = .986$, $p = .000$.

A *satisfaction survey* was used to capture feedback about the participants' experience completing the DEFUSE training course; it was administered following completion of the online training. The survey contained five 4-point Likert-type items, ranging from *Very Dissatisfied* to *Very Satisfied*, asking about the ease of navigating the program, the program's ability to maintain interest, the breadth of the curriculum, the simplicity of the acronym, and overall satisfaction. Two open ended qualitative items asked what participants specifically liked about the program and how the program could be improved.

Procedures

All participants completed the pre-test battery. Following this, participants were randomly assigned to either the control or experimental condition.

Control Condition. Approximately 7 days following pre-test, participants in the control condition were provided with the post-test battery, excluding the satisfaction survey. Recruitment of participants was gradual, permitting ongoing analysis of potential outcome effects. At midpoint in the recruitment process, it became apparent that DEFUSE was highly successful. At this point, recruitment ceased and all participants were offered the opportunity to complete DEFUSE. The control participants then received a personalized login and password to access the DEFUSE course; a final post-test battery, including the satisfaction survey but excluding BPAD due to financial constraints, was presented immediately upon completion of the course.

Experimental Condition. Participants in the experimental condition received a personalized login and password to access the DEFUSE course at the 7-day mark; the completion of the course prompted immediate access to the post-test battery.

DEFUSE contains two modules: Mental Illness and De-Escalation Skills. The first portion of the mental illness module of DEFUSE offers education about mental illness. It begins in an attempt to break down the negative schema people often have about mental illness and the types of people who suffer from it. Education about mental illness in general and mental illness as the result of the stresses of working in law enforcement are provided. This portion of the training emphasizes recovery with proper treatment, reminding officers that they are often the first professional to have contact with individuals exhibiting acute symptoms of mental illness; it emphasizes the critical role law enforcement has in diverting people from the criminal justice system into treatment. These topics are covered through didactics and video and graphic representations of real people living with mental illness. Research indicates that both education and contact have positive effects on reducing stigma for adults (Corrigan, Morris, Michaels, Rafacz, & Rusch, 2012) and increasing empathy (Kalisch, 1971).

The next portion of the mental health module educates learners about six common symptoms of mental illness: sadness, anxiety, anger, mania, delusions, and hallucinations. Being able to distinguish between various mental illnesses is beyond the role of law enforcement; diagnosis and treatment is best left for highly trained mental health professionals. However, law enforcement officers can benefit greatly from being able to recognize symptoms of mental illness to aid in determining what skill set will work best to keep themselves safe. Each symptom is introduced didactically based on DSM 5

criteria. Following this, learners are presented with a demonstrative video clip or activity; many of the videos show excerpts of law enforcement officers displaying the symptoms as portrayed in well-known television shows. The section on hallucinations requires the learner to complete a word search review of the learned symptoms while experiencing auditory hallucinations. A knowledge check follows these demonstrations, reinforcing the most critical information for law enforcement officers to know.

The de-escalation module teaches learners six skills for de-escalation: gather data and document, set expectations, figure out feelings of the subject, demonstrate understanding, self-monitor, and use the environment. The course name, DEFUSE, also serves as an acronym to aid in recall of each of these skills. The structure of this module facilitates increased officer self-efficacy. Learners are initially introduced to each skill through simple and clear language. Next, they observe Officer Fuller model the skill through interactions with Mary, a subject displaying delusional thinking and anger. The presented information is reviewed and the learner is asked to explain the skill in his/her own words. Following this, learners have the opportunity to rehearse the skill by roleplaying with David, a subject displaying anger and sadness; suggestions are offered before transitioning to the subsequent skill. Self-monitoring is structured differently as the focus is on the learner being aware of his/her own body, emotions, and limitations. Following psychoeducation on these topics, the learner is invited to practice deep breathing strategies, mindfulness and meditation exercises, and shown how to use visualizations and positive self-talk. Throughout the de-escalation module, learners are reminded of the importance of staying calm and being patient, repeating their message,

and not taking anything stated by a subject personally; this module has a heavy emphasis on effective communication strategies.

Results

Preliminary Analyses

Multivariate analyses of variance (MANOVAs) were conducted on the pretest scores of control and experimental participants. The first was on the battery of all the CIT measures in addition to the knowledge questionnaire, the second on the individual BPAD video vignette scores. Neither MANOVA was significant (Wilk's $\lambda = .770$, $F(5, 18) = 1.076$, $p = .406$, partial $\eta^2 = .230$; Wilk's $\lambda = .891$, $F(3, 8) = .327$, $p = .806$, partial $\eta^2 = .109$) respectively, indicating that random assignment was successful in producing pretreatment equivalence on all measures.

Pre and post scores for all participants on each measure are presented in Table 2 (see Appendix C).

Benefits of Treatment on the CIT Measures

A treatment-by-repeated-measures MANOVA (condition x pre-posttest) was conducted on the pre and post-test scores for the CIT measures. Interaction effects favoring DEFUSE were expected; neither treatment nor repeated measures main effects noted in Table 2 are relevant to the hypotheses. Effect sizes were also calculated and are reported as partial η^2 .

The repeated measures MANOVA interaction on the CIT measures was significant (Wilk's $\lambda = .290$, $F(4, 19) = 11.645$, $p = .000$, partial $\eta^2 = .710$) indicating beneficial effects favoring DEFUSE across the entire battery. Univariate follow-ups were also significant: Empathy, $F(1, 22) = 12.025$, $p = .002$, partial $\eta^2 = .353$; Stigma, $F(1, 22)$

= 10.464, $p = .004$, partial $\eta^2 = .322$; Self-Efficacy, $F(1,22) = 29.295$, $p = .000$, partial $\eta^2 = .571$; Reported Behavior Outcomes, $F(1, 22) = 11.871$, $p = .002$, partial $\eta^2 = .350$. In sum, following DEFUSE participants showed greater empathy toward individuals with mental illness, lower levels of stigma toward mental illness, improved self-efficacy in effectively handling mental health crises, and improved recognition of behavioral outcomes to benefit such interactions.

Replication Analyses. Dependent t-tests were conducted to compare the control group's post-test data with scores obtained following their completion of DEFUSE. These contrasts were significant on three of the CIT measures, Empathy, $t(5) = 4.505$, $p = .003$, partial $\eta^2 = .802$; Self-Efficacy, $t(5) = 3.386$, $p = .01$, partial $\eta^2 = .555$; and, Reported Behavior Outcomes, $t(5) = 2.496$, $p = .0275$, partial $\eta^2 = .696$. The stigma measure was marginally significant, $t(5) = 1.615$, $p = .0835$, partial $\eta^2 = .343$. In sum these replication analyses further indicate that DEFUSE is an effective intervention to increase empathy toward individuals with mental illness, decrease levels of stigma toward mental illness, improve self-efficacy in effectively handling mental health crises, and improve recognition of behavioral outcomes to benefit such interactions.

Benefits of Treatment on the Additional DEFUSE Measures

A treatment-by-repeated-measures ANOVA (condition x pre-posttest) was conducted on the pre and post-test scores for the knowledge measure. The repeated measures interaction was significant, $F(1, 22) = 11.851$, $p = .002$, partial $\eta^2 = .350$, indicating that participants showed increased knowledge of mental illness and de-escalation following the completion of DEFUSE.

Twelve people completed the BPAD vignettes; the other participants noted not having the required equipment and discomfort with the recording protocol. Univariate analysis of variance on the pre and post-test scores revealed significance, $F(1, 10) = 5.358, p = .043$, partial $\eta^2 = .349$, indicating that the completion of DEFUSE also significantly improved observed performance competence of de-escalation skills.

In general, people were very happy with DEFUSE. Twenty-two participants completed the satisfaction survey, rating the program and experience of completing it. Mean responses on each of the 4-point Likert-type items ranged from 3.45 to 3.7. Participants were happiest with the breadth of the curriculum ($\bar{x} = 3.7$) and least satisfied with the program's ability to maintain their interest ($\bar{x} = 3.45$). The ease of navigating the program, the acronym DEFUSE, and overall experience scores further indicated satisfaction ($\bar{x} = 3.5$). Individual comments specific to what was liked and ways of improving the program can be found in Table 3 (see Appendix D).

Replication Analyses. A dependent t-test was also conducted on the knowledge measure to compare the control group's post-test data with scores obtained following their completion of DEFUSE. This contrast was significant, Knowledge, $t(5) = 7.319, p = .0005$, partial $\eta^2 = .915$, again indicating an increase in knowledge of mental illness and de-escalation following the completion of DEFUSE.

Discussion

The current study evaluated the effectiveness of an online de-escalation training developed specifically for law enforcement officers responding to mental health crises: DEFUSE. It utilized a battery of measures also used by CIT to facilitate comparison but uniquely added additional procedures to capture objective behavioral proficiency,

DEFUSE knowledge, and satisfaction. DEFUSE is the first intervention specifically developed for law enforcement, providing a curriculum on mental illness and de-escalation, that has been evaluated through a randomized controlled trial and replication.

Analyses revealed that attempts to obtain pre-treatment equivalence were successful. Participants also demonstrated greater empathy toward individuals with mental illness, lower levels of stigma toward mental illness, improved self-efficacy in effectively handling mental health crises, improved recognition of behavioral outcomes to benefit such interactions and increased knowledge of mental illness and de-escalation following the completion of DEFUSE. Furthermore, the completion of DEFUSE also significantly improves observable performance competence of de-escalation skills.

In sum, this randomized controlled trial indicates that DEFUSE is a powerful tool for teaching law enforcement how to better handle mental health crises. DEFUSE provided strong effects on each of the CIT measures; in comparison, research conducted on the 40-hour CIT training has found moderate effects, at best, on some of the same measures used in this study (Compton et al., 2014a). In addition to larger effect sizes, DEFUSE is more cost and time effective and easily scalable to officers across the country. For completion, officers only need access to a computer with internet capabilities, standard equipment in law enforcement agencies across the country. Rather than requiring a full 40-hour work week, DEFUSE can be completed in just two hours by most people. The financial burden of completing DEFUSE is also negligible in comparison to completing CIT training. Using the same numbers as El-Mallakh et al. (2014), the cost of training a recruit with DEFUSE is less than 10% the cost of training a recruit in CIT.

Ideally an academy or department not trained in CIT would require completion of DEFUSE by all its officers. This structure would facilitate participation in future research from both officers who would volunteer and those who would opt out of such training. Feedback from both groups would provide valuable insight into ways to improve the course and to determine the efficacy of the program across all types of officers. It is plausible that the brief introduction to mental illness and de-escalation offered through DEFUSE might provide the impetus for resistant officers to seek additional training; at a minimum, resistant officers would receive some awareness of symptoms and effective means of responding that they would not have otherwise.

Future versions of DEFUSE will utilize more advanced programming to incorporate participant recommendations; video vignette roleplays could also be included directly within the programming. Inclusion of additional role-play scenarios throughout the course will further enhance learner's self-efficacy with novice mental health crisis scenarios. Furthermore, additional courses could be developed to expand on content introduced in the original course and provide introductions to other relevant topics for law enforcement (e.g., trauma, addiction, developmental disabilities). DEFUSE could also be easily customized for specific positions within law enforcement (e.g., dispatchers, patrol officers, correctional officers, probation/parole officers).

Since this initial data are so promising, development and evaluation of DEFUSE will continue. Obtaining entire department or academy participation in future studies using a randomized controlled design would allow researchers to consider the effectiveness of the program while eliminating selection bias commonly seen with mental health trainings being optional. This brief online mental health training is cost effective

for law enforcement agencies and can be completed whenever convenient for individual officers while relaying consistent information to each learner. DEFUSE was developed to require active participation of the learner to enhance learning and lead to mastery of the information taught. Furthermore, it is scalable to a large audience, including officers in rural communities and in departments with limited resources; the course can be shared with anyone having access to a computer and the internet. As such, DEFUSE might be the solution to aiding officers in recognizing the role identifying mental illness has in their duty to serve and protect.

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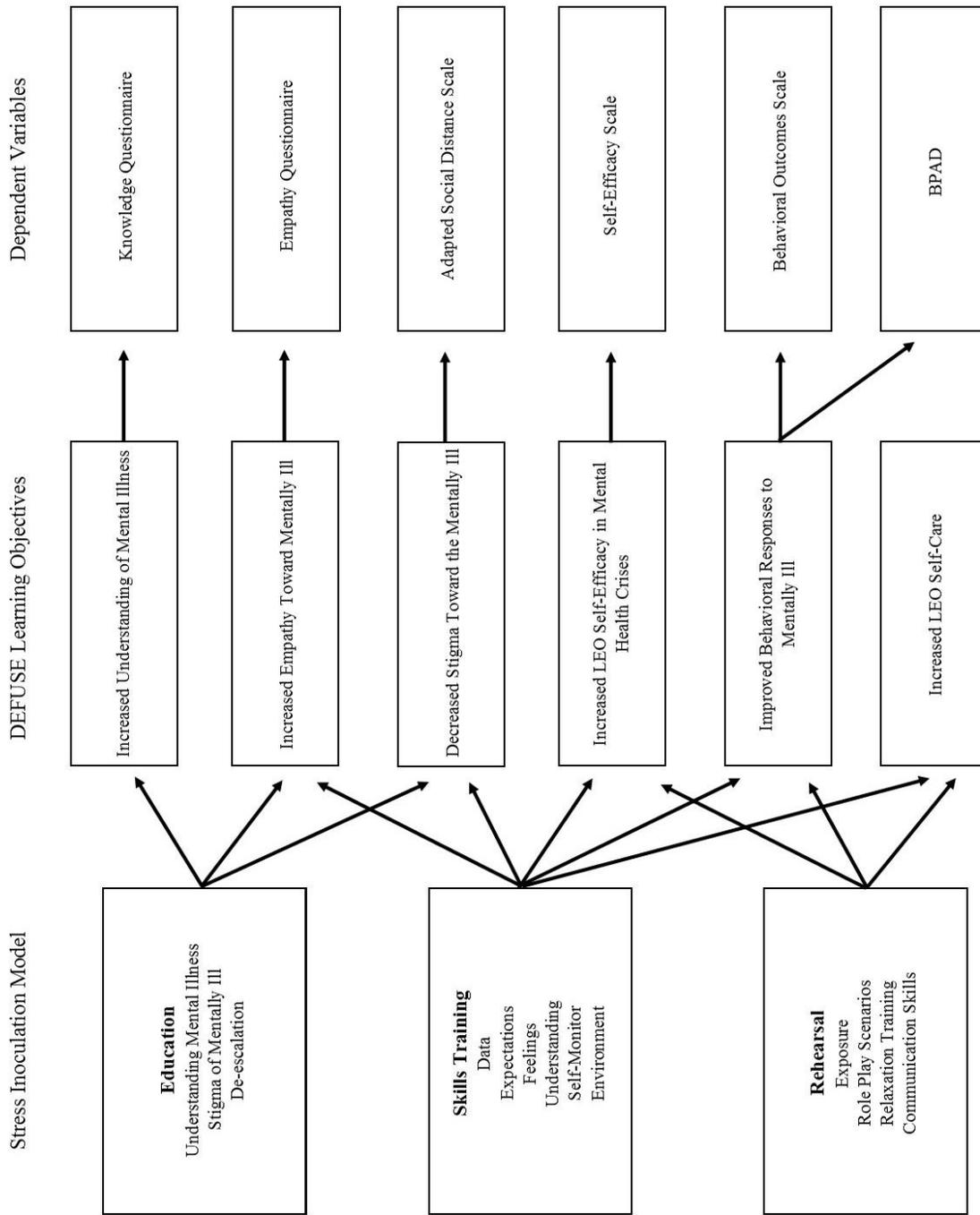
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APPENDIX A

FIGURE 1: A PRIORI LOGICAL RELATIONSHIPS BETWEEN STRESS
INOCULATION MODEL, DEFUSE TRAINING, AND DEPENDENT VARIABLES
OF EXPERIMENT



APPENDIX B

TABLE 1. PARTICIPANT DEMOGRAPHICS BY CONDITION

Table 1.
Participant Demographics by Condition (N = 24)

	<i>N</i>	Percentage
Gender		
Control	9 male	75%
Experimental	8 male	66.7%
Education Level		
Control		
HS/GED	2	16.7%
Associates/Bachelors	9	75.0%
Masters or Higher	1	8.3%
Experimental		
HS/GED	2	16.7%
Associates/Bachelors	7	58.3%
Masters or Higher	3	25.0%
Race/Ethnicity		
Control	10 Caucasian	83.3%
Experimental	11 Caucasian	91.7%
Location		
Control		
Rural	3	25.0%
Suburban	3	25.0%
Urban	6	50.0%
Experimental		
Rural	3	25.0%
Suburban	5	41.7%
Urban	4	33.3%
States Represented		
Control	7	63.6%
Experimental	8	72.7%
Mental Illness (MI) Experience		
Control		
Know Someone Diagnosed	10	83.3%
Know Someone in Treatment	8	66.7%
Experimental		
Know Someone Diagnosed	9	75.0%
Know Someone in Treatment	7	58.3%

APPENDIX C

TABLE 2: MEANS, STANDARD DEVIATIONS, REPEATED MEASURE ANOVAS
OF CONTROL AND EXPERIMENTAL CONDITIONS BY TESTING OCCASION

Table 2.
Means, Standard Deviations, and Repeated Measure ANOVAs of Control and Experimental Conditions by Testing Occasion

	Pre-Test		Post-Test		Repeated Measure ANOVA	
	Control	Experimental	Control	Experimental	Repeated Measures Effect	Treatment Effect
	M (SD)	M (SD)	M (SD)	M (SD)	F (η^2)	F (η^2)
Empathy	92.00 (14.75)	87.42 (19.85)	84.25 (17.29)	92.33 (15.72)	.602 (.027)	.068 (.003)
Stigma	26.42 (4.89)	27.58 (2.68)	25.50 (4.62)	30.67 (2.67)	3.07 (.122)	4.77* (.178)
Self-Efficacy	41.25 (8.45)	40.83 (7.81)	41.58 (7.03)	51.83 (7.11)	33.07* (.061)	2.76 (.112)
Reported Behavior	53.75 (4.69)	54.67 (2.71)	52.00 (4.51)	57.33 (3.14)	.511 (.023)	4.71* (.176)
Knowledge	13.75 (1.66)	15.08 (1.51)	14.08 (1.68)	17.33 (.888)	21.53* (.495)	18.66* (.459)
BPAD+	7.00 (3.85)	7.08 (5.95)	12.08 (6.12)	19.83 (11.51)	28.99* (.744)	.983 (.089)

* $p < .05$ $N = 24$

+ $N = 12$

MANOVA Treatment Main Effect, Wilk's $\lambda = .667$, $F(4,19) = 2.373$, $p = .089$, partial $\eta^2 = .333$

MANOVA Repeated Measure Main Effect, Wilk's $\lambda = .341$, $F(4,19) = 9.181$, $p = .000$, partial $\eta^2 = .659$

APPENDIX D

TABLE 3: SATISFACTION SURVEY QUALITATIVE FEEDBACK

Table 3.
Satisfaction Survey Qualitative Feedback (N=22)

Strengths of DEFUSE	Ways to Improve DEFUSE
<p>“convenient”</p> <p>“excellent content”</p> <p>“easy to remember”</p> <p>“easy to understand and summarized well”</p> <p>“I liked the structure of the program that allowed for my own input after a vignette.”</p> <p>“I liked how the program included the officer’s feelings and ways to positively impact our professional and personal lives. I loved that the program talked about how to recognize self and situational escalation and gave tools to prevent a situation from getting out of hand. I liked how the program gave ideas for how to deal with various types of subjects. It is a very important factor to realize that no individual with any particular mental illness or personal situation will act the same. This program did a great job of including realistic scenarios in order to incorporate the training. In work and my personal life, I have witnessed many persons with similar behaviors as portrayed in these videos and scenarios.”</p> <p>“For me I got the most out of the descriptions, symptoms, and definitions of each of the mental illnesses. I’ve never been given that info before so it was good to see what each was. I like the simplicity of the defuse acronym and how it</p>	<p>“I would like to have more interaction on scenarios if that were possible.”</p> <p>“It could have used more training scenarios to practice the acronym in action.”</p> <p>“Overall I really enjoyed the training and I feel much more prepared to deal with the situations showcased, but it could be useful to have more roleplaying involved.”</p> <p>“Maybe more practice with using the techniques during the training.”</p> <p>“It would be helpful if there was a symbol that shows the progress/level of completion as you go along.”</p> <p>“The only thing that could be improved would be to break the training session up. The training for me was too much all at once.”</p> <p>“User needs to be able to control the pace better.”</p> <p>“It’d be great if there was a better way to navigate through the slides to review.”</p> <p>“I really saw no issues except for the comment about keeping away from your sidearms when comfortable. This has been drilled into our head since we start in this field, it is very difficult not to “touch” our sidearms (as we all know, things can go to shit in a</p>

<p>reviews good conversation practices that are great for using with any subject not just mental illness.”</p> <p>“It was very educational and interesting. Once I started I wanted to finish. I really enjoyed going through and learning even more about illnesses and finding ways to relate. Now I can not only use this for my work but also personal.”</p>	<p>hurry out there!). I honestly try to just rest my forearm on my gun, it offers me control, I’m in close proximity, but not actually “hands on”. I definitely understand your point of view of appearing less intimidating by doing so, but it is a HARD habit to break!!”</p> <p>“Incorporating law enforcement instructors in the development of training. This would strengthen the transition from trained safety tactics into de-escalation of a situation and when it is or is not safe to utilize this training. Including multiple training ideologies into the same training events would assist in developing well rounded officers.”</p>
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