THESIS

SUSTAINING THE EFFECT OF GATEKEEPER TRAINING:

AN EMPIRICAL EXAMINATION OF TWO POST-TRAINING INTERVENTIONS

Submitted by

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ABSTRACT

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Introduction: There is ample evidence supporting the application of gatekeeper training programs toward suicide prevention efforts (e.g., Cross, Mattieu, Cerel, & Knox, 2007; Wyman, Inman, Brown, Cross, Schmeelk-Cone, & Pena, 2008). However, recent studies (e.g., Chen, Gibbs, & Moore, 2009; Keller et al., 2009) suggest that knowledge and self-efficacy may significantly decline over time. The purpose of this study was to develop and evaluate two interventions that could boost gatekeepers' confidence in their ability to intervene. Two different intervention videos were created in collaboration with key members of the suicide prevention community in Colorado. The interventions were rooted in self-efficacy theory (SET; Bandura, 1977) which has been found to improve self-efficacy.

Method: Data were collected at pre-test and post-test. Gatekeepers (N = 783) who took part in gatekeeper training (e.g., Applied Suicide Intervention Skills Training, ASIST; and Question, Persuade, Refer, QPR) were randomly assigned into one of three groups: (a) 6-minute treatment video, (b) 10-minute treatment video, and (c) 6-minute control webinar. Four scales were developed for this study and included questions adapted from similar studies (e.g., Lent, Lopez, & Bieschke, 1991; Usher & Pajares, 2006). To handle missing data at the post-test (n = 24), an expectation maximization (EM) algorithm was utilized for this study.

Results: The majority of participants (N = 124) were female (83.1%), were more likely to have taken ASIST training (57.3%), and ranged in age from 23 to 81 years old. Findings indicate that there were no significant differences in self-efficacy between the treatment groups

($F(3, 120) = .07$, $p = .935$, $\eta_p^2 = .001$) or within the treatment groups ($\lambda = 0.99$, $F(1, 122) = 0.36$, $p = .696$. Despite the ineffective treatments developed for this study, the multiple linear regression models that were conducted support the application of self-efficacy theory in the context of suicide prevention training. For instance, one of the models explained 62% of the variance in self-efficacy outcomes. Furthermore, physiological and affective states and vicarious experience were found to make independent contributions to self-efficacy outcomes. These findings suggest that SET is relevant for suicide prevention.

Discussion and Implications: This study created and evaluated two post-training interventions. Given that SET was found to significantly contribute to self-efficacy outcomes, this theory may be useful in the development of future gatekeeper post-training interventions. In spite of the limitations of this study (e.g., low sample size, demand characteristics), these findings may help researchers and the suicide prevention community better understand and develop interventions that may increase gatekeepers' confidence to intervene with individuals at risk for suicide.

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INTRODUCTION

According to the Center for Disease Control and Prevention (2010), on average, one person in the United States dies by suicide every 15 minutes. This statistic suggests that every day, nearly 100 people die by suicide - a largely preventable outcome. To address this public health concern, Congress passed the Garrett Lee Smith Memorial Act (GLSMA, 2004), a grant program that supports states, tribes, and universities in the development and implementation of suicide prevention strategies specific to youth, adolescents, and college-aged students. Five years later, the Department of Health and Human Services received 40 million dollars toward additional suicide prevention efforts. Clearly, the U.S. government has taken a stake in preventing suicide in our nation.

One widely disseminated approach to suicide prevention is gatekeeper training (Gould & Kramer, 2001; Quinnett, 2007). Gatekeeper training programs (e.g., Applied Suicide Intervention Skills Training, ASIST; and Question, Persuade, Refer, QPR) train *gatekeepers* to identify, intervene, and refer people in crisis to appropriate treatment (Reis & Cornell, 2008). Gatekeepers are individuals in the community who have received suicide prevention training and have acquired the ability and confidence to apply their suicide prevention skills. Gatekeeper training is designed so that anyone can be a gatekeeper and save a life (Isaac et al., 2009). Such programs can last anywhere from one hour to five days in duration. While the content of each training program can vary, the overall purpose of such programs is to provide gatekeepers with the knowledge, skills, and motivation necessary to prevent suicide (Gould & Kramer, 2001). Refer to Appendices A and B for further information about ASIST and QPR gatekeeper training.

Empirical support for gatekeeper training has been well-documented, especially for proximate outcomes. For instance, researchers have found that these programs increase trainee:

(a) suicide prevention knowledge (e.g., Cross, Matthieu, Cerel, & Knox, 2007; Keller, Schut, Puddy, Williams, Stephens, McKeon, & Lubell, 2009; Matthieu, Cross, Batres, Flora, & Knox, 2008; Matthieu, Ross, & Knox, 2006; Wyman, et al., 2008), (b) skills (e.g., Tierney, 1994), (c) intentions to intervene (e.g., Chen, Gibbs, & Moore, 2009), and (d) self-efficacy (i.e., confidence to perform a behavior) following training (e.g., Chen et al., 2009; Cross et al., 2007; Keller et al., 2009; Matthieu et al., 2006, 2008; Wyman et al., 2008). Such findings demonstrate the utility of gatekeeper training programs for proximate outcomes.

However, less is known about the long-term effects of gatekeeper training programs. Recent findings (e.g., Chen et al., 2009; Keller et al., 2009) indicate that knowledge and self-efficacy may decrease over time following gatekeeper training. For example, Chen and colleagues (2009) found that the self-efficacy of ASIST trainees significantly declined six months after training, with a comparable, though non-significant trend observed for QPR. Keller and associates (2009) found similar, though non-significant trends six months after QPR training for gatekeepers employed in child service industries (e.g., education, juvenile justice). Such findings suggest that the effectiveness of gatekeeper training programs may not last.

Several researchers (e.g., Baldwin & Ford, 1988; Goldstein & Ford, 2002; Tziner, Haccoun, & Kadish, 1991) contend that most training outcomes decay over time. Training decay or the dissipation of training effects is more likely when trainees have not had the opportunity to apply the skills they learned during training (Arthur, Bennett, Stanush, & McNelly, 1998). In fact, findings from Moore, Cigularov, Chen, Martinez, and Hindman (2011) suggest that the application of suicide prevention skills may be stymied due to a number of situational obstacles (e.g., opportunity to use, time availability). Therefore, both skill decay and situational obstacles

specific to gatekeeper training may decrease the likelihood that gatekeepers will maintain their skills after training.

To date, only Wyman, Inman, Brown, Cross, Schmeek-Cone, and Pena (2008) have examined whether a post-training intervention strategy (i.e., 30-minute QPR refresher training) may help gatekeepers sustain the effect of their training. Regrettably, this intervention produced null effects on the following outcomes: (a) knowledge of suicide prevention, (b) appraisals, (c) behaviors, and (d) communication at follow-up. These null findings coupled with a lack of research in distal suicide prevention outcomes led Chen and colleagues (2009) to question *what* strategies might help gatekeepers sustain the effects of training.

Thus, considering the fact that suicide is a major public health concern, that millions of dollars have been allocated toward suicide prevention efforts, and that the effectiveness of gatekeeper training programs may not last over time it seems evident that more research needs to be conducted on this topic. This research should develop and evaluate potential strategies that could sustain the effects associated with gatekeeper training. Therefore, the purpose of this particular study is two-fold: (a) to determine if post-training interventions based on self-efficacy theory (SET; Bandura, 1977; 1997) may significantly increase trainee self-efficacy toward suicide prevention, and (b) to examine what components of an intervention may contribute to changes in self-efficacy outcomes.

Gatekeepers with higher levels of self-efficacy have been found to possess greater intentions to intervene and report more suicide prevention behavior (Chen et al., 2009). Such trainee outcomes are desirable in the fight to prevent suicide. Thus, self-efficacy theory was selected as the theoretical foundation for this study for a number of reasons. First, this theory provided four testable strategies that have been posited to increase trainee self-efficacy (Bandura,

1977; 1997). For example, it was reasoned that such strategies could be practically implemented and evaluated for the purpose of this study. Second, self-efficacy has been found to improve training outcomes by influencing trainees' effort and persistence toward a target behavior (e.g., Lee & Bobko, 1994; Locke & Latham, 1990). In addition, given potential issues with training decay and situational obstacles, focusing on self-efficacy seemed like a solid direction. Lastly, it seemed logical that gatekeepers who are more confident in their suicide prevention abilities may be more likely to apply their suicide prevention skills after training. Thus, the following research questions were examined in this study: (a) can a post-training intervention (either a 6-minute video or 10-minute video) increase gatekeeper self-efficacy compared to a control webinar? and (b) what components of a post-training intervention may contribute to changes in self-efficacy outcomes?

The remainder of the introduction consists of three main sections. In the first section, training transfer and self-efficacy are defined and discussed as they relate to sustaining the effect of suicide prevention training. Next, self-efficacy theory (SET; Bandura, 1977; 1997), the theoretical foundation for this study, is reviewed as it relates to the development of the two post-training interventions. Finally, the development of each intervention is described in greater detail. This introduction outlines key terms and concepts that helped shape the interventions developed for this study.

Training transfer and self-efficacy

Goldstein and Ford (2002) describe *training* as "…the systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance in another environment" (p. 1). Baldwin and Ford (1988) suggest that *training transfer* refers to how individuals generalize and maintain material learned from training into a new environment. Specific to this study, training

transfer concerns how gatekeepers apply their suicide prevention skills after training and maintain their self-efficacy.

Bandura (1986) defines self-efficacy as a person's confidence in their ability to perform a specific behavior (e.g., suicide prevention). According to Bandura (1977), self-efficacy consists of the following three dimensions: (a) *strength*, (i.e., the level of conviction someone holds toward a behavior), (b) *magnitude*, (i.e., the perceived difficulty of performing a target behavior), and (c) *generality*, (i.e., how general or specific an efficacy expectation is toward a target behavior). Each of these dimensions reflects individuals' perceptions and beliefs concerning their perceived ability toward a particular task within a specific situation. In this study, self-efficacy pertains to the strength of gatekeepers' confidence in their perceived ability to intervene with a person at risk for suicide.

The relationship between self-efficacy and training transfer has been well-established in the literature. Indeed, self-efficacy has consistently emerged as a key factor that can improve training transfer outcomes (e.g., Blume, Ford, Baldwin, & Huang, 2010; Brown, 2005; Brown & Latham, 2000a; Ford, Smith, Weissbein, Gully, & Salas, 1998; Gaudine & Saks, 2004; Gist, Stevens, & Bavetta, 1991; Gist & Mitchell, 1992; Quinones, Ford, Sego, & Smith, 1995; Schwoerer, May, Hollensbe, & Mencl, 2005; Tracey, Hinkin, Tannenbaum, & Mathieu, 2001). For example, individuals who have greater levels of self-efficacy are more likely to perform the behaviors in which they are trained (Ford, Quinones, Sego, & Sorra, 1992) and exhibit improved transfer of performance outcomes (Ford et al., 1998). Additionally, self-efficacy may be an effective mechanism to improve transfer because of its motivational effects (Quinones et al., 1995) and influence on training reactions (Mathieu, Martineau, & Tannenbaum, 1993). Such

findings provide support for the significant role that self-efficacy plays in enhancing training transfer outcomes.

In regards to the maintenance component of training transfer, Marx (1982) proposed that individuals who believe they can successfully perform a task are more likely to be resilient when they encounter obstacles at work. Supporting this claim, researchers (e.g., Bandura & Wood, 1989; Brown, 2005; Lock & Latham, 1990) have found that self-efficacy can facilitate training maintenance by influencing trainees' effort, persistence, and task strategies following training. For example, in a study examining ways to improve negotiation skills, self-efficacy predicted the acquisition and maintenance of such skills (Gist et al., 1991). Clearly, these findings support the relationship between self-efficacy and training maintenance.

Another way in which self-efficacy may contribute to the effectiveness of the proposed interventions is through its relationship with behavior change (Bandura, 1977; Strecher, DeVellis, Becker, Rosenstock, 1986). For instance, gatekeepers who have higher levels of self-efficacy may be more likely to apply their suicide prevention skills after training. Given that many trainees have not applied their suicide prevention skills, intervening or referring someone at risk would represent a change in behavior. In fact, Bandura (1986) described behavior change as a combination of self-efficacy and outcome expectations (i.e., individuals' expectations about their performance of a behavior. Further, self-efficacy is posited to play a central role in behavior change and maintenance (Bandura, 1977). According to Bandura (1991), both of these constructs play a role in the adoption and modification of health behaviors and how individuals sustain change. In addition, Bandura (1986) has argued that self-efficacy provides a unifying theory of behavior change.

Supporting this perspective, self-efficacy is part of a number of notable behavior change theories such as: (a) social cognitive theory (SCT; Bandura, 1986), (b) the theory of planned behavior (TPB; Ajzen, 1991), and (c) the health belief model (HBM; Becker, 1974; Rosenstock, 1974). Each of these behavioral change models integrates self-efficacy into their framework. For example, self-efficacy is a central component of social cognitive theory in which individuals learn by observing others either directly (e.g., social interaction) or indirectly (e.g., media influences). Within this theory, individuals are both agents and responders to change (Glanz & Bishop, 2010). Research suggests that SCT may improve training transfer (Tziner et al., 1991).

Within the theory of planned behavior, Ajzen (1991) proposed that individuals are less likely to perform a behavior if they lack confidence in their abilities. TPB emphasizes how personal attitudes, subjective norms, and perceived behavioral control can shape individuals' intentions toward a behavior which in turn can predict behavior. Similarly, the health belief model (Becker, 1974; Rosenstock, 1974) suggests that perceived behavioral control can predict behavior. Indeed, Fishbein and Capella (2006) suggested that perceived behavioral control (i.e., individuals' perceived ease or difficulty in performing a specific task) and self-efficacy are interchangeable concepts that inform behavioral intentions and subsequent behaviors. Moreover, Ajzen (2002) suggested that these two constructs are quite similar to each other. In sum, the relationship between self-efficacy and behavior change is theoretically strong - self-efficacy contributes to behavioral change by shaping attitudes and behavioral intentions toward a specific behavior.

Self-efficacy theory

One approach that has been utilized to promote self-efficacy is self-efficacy theory (SET; Bandura, 1977; 1997). According to SET, there are four sources of information that can bolster

individuals' confidence to perform a particular behavior such as suicide prevention: (a) *mastery experience* (i.e., successful performance of a past behavior); (b) *verbal persuasion* (i.e., positive feedback from others that promotes a target behavior); (c) *vicarious experience* (i.e., observing others successfully model a target behavior); and (d) *physiological and affective states* (i.e., reducing negative emotional or physical responses toward a target behavior). Each source of information is postulated to shape individuals' self-efficacy regarding their perceived abilities, which in turn influences their behavior. Given the importance of self-efficacy in training transfer and behavior change, strategies that enhance self-efficacy outcomes may be crucial in the development of effective interventions. In the following section, each source of self-efficacy will be described in greater detail.

Mastery experience. Mastery experience occurs when two conditions are met: (a) an individual successfully performs a target behavior, and (b) this individual perceives their behavior as a success. Mastery experience is based on individuals' perceptions of an ability rather than an objective assessment of their ability. However, such perceptions of ability are formed by direct experience with a specific behavior. According to Bandura (1977), self-efficacy should increase if a person performs a behavior well and if they make the attribution that such an experience was a success. Unfortunately, if an individual fails at a task or believes they have failed, their self-efficacy is proposed to decrease.

Bandura (1994) asserted that mastery experience promotes self-efficacy by building trainee confidence, motivation, and persistence toward a behavior. Strecher and colleagues (1986) argued that mastery experience may enhance self-efficacy because it provides individuals with an opportunity to build and refine their skills while developing ways to cope with obstacles. In addition, mastery experience has consistently been found to be a significant and strong

predictor of self-efficacy across a number of studies (e.g., Bandura, 1977; Lent et al., 1991; Matsui, Matsui, & Ohnishi, 1990; Strecher et al., 1986; Usher & Pajares, 2006). In fact, many studies (e.g., Bandura, 1986; 1997; Britner & Pajares, 2006; Lent et al., 1991; Matsui et al., 1990; Usher & Pajares, 2008) have found that mastery experience is the most robust (i.e., explains the most variance) predictor of self-efficacy among the four sources.

In the academic domain, mastery experience has been found to increase self-efficacy in writing (e.g., Pajares, Johnson, & Usher, 2007) and math (e.g., Campbell & Hackett, 1986; Cordero, Porter, Israel, & Brown, 2010; Luzzo et al., 1999; Matsui et al., 1990). Specific to intervention development, Cordero and colleagues (2010) found that interventions incorporating mastery experience resulted in significantly higher levels of math self-efficacy.

In the area of health behavior adherence, mastery experience has been found to increase self-efficacy (e.g., Basen-Engquist et al., 2011; Wise & Trunnell, 2001). For example, in an empirical study examining confidence to perform bench presses at the gym, an intervention based on mastery experience resulted in stronger bench-press self-efficacy compared to interventions utilizing only vicarious experience and verbal persuasion (Wise & Trunnell, 2001).

While mastery experience has received support in the literature, one clear limitation of this construct is that it is assumes that individuals have the opportunity to apply their skills after training. Unfortunately, gatekeepers may not have had a chance to apply their suicide prevention skills following training (Moore et al., 2011). In addition, mastery experience is a variable that may not be able to be directly manipulated in this study. Therefore, this variable may be statistically controlled as a covariate.

Verbal persuasion. According to Bandura (1977; 1986; 1994), verbal or social persuasion motivates individuals to perform a behavior by giving them the belief that they can

succeed at a given task. Through verbal persuasion, individuals are convinced or encouraged by significant others (e.g., friends, family, colleagues, supervisors) to engage in a specific behavior. For instance, Bandura (1994) found that self-efficacy is more likely to be maintained when significant others are able to encourage trainees' abilities.

However, empirical support for verbal persuasion has been mixed. On one hand, researchers (e.g., Klassen, 2004; Usher & Pajares, 2006) have found that verbal persuasion contributes to self-efficacy independent of the other three sources of information. In addition, verbal persuasion may enhance the other three predictors of self-efficacy. In fact, Bandura (1997) describes the role of verbal persuasion as a, "...useful adjunct to more powerful efficacy-promoting influences" (p. 106). For example, compared to an intervention that only used mastery experience, an intervention that also applied verbal persuasion was found to be more effective at increasing self-efficacy (Tschannen-Moran & McMaster, 2009). On the other hand, Bandura (1977) suggested that verbal persuasion alone may not be sufficient to create a lasting sense of self-efficacy. More specifically, various studies have found that verbal persuasion may not independently predict self-efficacy (e.g., Cordero et al., 2010; Tschannen-Moran & McMaster, 2009; Wise & Trunnell, 2001), nor influence self-efficacy outcomes (e.g., Matsui et al., 1990). Such findings imply that verbal persuasion may be the weakest predictor of self-efficacy in this study.

Vicarious experience. This construct describes how individuals learn to perform a target behavior by observing and comparing themselves to significant others. Vicarious experience involves the use of role models (i.e., social models) - individuals who can provide trainees with general rules and strategies to overcome challenges and effectively perform a target behavior (Bandura, 1977). Modeling can occur either directly (i.e., observing someone perform a

behavior) or indirectly (i.e., hearing someone's story). More specifically, in order for vicarious experience to be effective, a significant other needs to show or tell trainees how they can successfully perform a target behavior.

Many researchers (e.g., Ashford, Edmunds, & French, 2010; Bandura, 1986; 1997; Luzzo et al., 1999; Matsui et al., 1990) have found evidence that vicarious experience significantly contributes to self-efficacy. For instance, in a meta-analysis examining best practices to strengthen self-efficacy in the context of physical activity, interventions that incorporated vicarious experience were more likely to increase trainee self-efficacy than interventions without this source of information (Ashford et al., 2010). Unfortunately, findings in the literature have also proven to be inconsistent (e.g., Lent et al., 1991; Pajares et al., 2007). For instance, in a study examining math self-efficacy in relation to science-based careers, Lent and colleagues (1991) found that vicarious experience did not significantly predict self-efficacy. Taken together, the application of vicarious experience through social models may be a promising direction in maintaining gatekeepers' self-efficacy.

Physiological and affective states. This last source of information describes how a person reacts physically or emotionally toward performing a behavior. Reactions such as anxiety and arousal (e.g., increased heart rate, sweating) may provide individuals with information regarding their potential for success or failure. According to Bandura (1977), physiological and affective states can be both informative and motivational depending on how an individual evaluates their response to the stimuli. Negative attributions toward a behavior (e.g., anxiety, fear) will decrease confidence; whereas, positive attributions (e.g., stamina, excitement) are proposed to strengthen self-efficacy. From this perspective, gatekeepers might judge their ability to save a life based on how they feel about performing this behavior. For this study,

physiological and affective states and emotional affect will be interchangeable terms.

Support for emotional affect as a predictor of self-efficacy has been mixed. Some researchers (e.g., Anderson & Betz, 2001, Matsui et al., 1990; Pajares et al., 2007) found that this source of information predicts self-efficacy; whereas, other researchers (e.g., Britner & Pajares, 2006) have not found such a relationship. It is possible that researchers found differing results as a function of how this construct was measured. For example, whether physiological and affective states was measured as either positive or negative valence. To avoid confusion, the interventions developed for this study focus on negative valence or stress responses to suicide prevention behaviors.

In summary, research suggests that self-efficacy can influence training transfer and persistence toward a behavior – important outcomes when considering strategies to sustain gatekeeper training. However, the application of self-efficacy theory in the context of gatekeeper training programs is a new direction in the suicide prevention literature. Therefore, in the following section, concepts from training transfer, self-efficacy, and self-efficacy theory will be synthesized toward the development of the two interventions proposed for this study.

Development of two post-training interventions

The post-training interventions were developed by utilizing personal narratives and success stories. Personal narratives can provide a method in which to directly (e.g., verbal persuasion, physiological and affective states) or indirectly (e.g., vicarious experience) influence self-efficacy outcomes. For example, researchers (e.g., Bell & Kozlowski, 2008) have found that success stories can engage learners, promote greater effort toward a task, and help individuals through simulated experiences. In addition, personal narratives have been found to help individuals personalize information, making content more relevant (e.g., Derouin, Fritzsche, &

Salas, 2005), easier to cognitively process (e.g., Bower, Black, & Turner, 1979; Martens, Jennings, & Jennings, 2007), and remember (e.g., Mandler & Johnson, 1977). Lastly, success stories have been found to change beliefs and attitudes (e.g., Green & Brock, 2000; Lemal & Van den Bulck, 2010; Prentice, Gerrig, & Bailis, 1997). Overall, there is research that suggests that success stories may be an effective tool to enhance self-efficacy because they can empower and persuade gatekeepers to transfer their suicide prevention skills after training.

For this study, the content of the videos was based on interviews with: (a) real suicide prevention *gatekeepers* (i.e., those who have intervened with individuals at-risk for suicide); (b) *survivors* (i.e., those who have lost someone to suicide); (c) *suicide attempters* (i.e., those who tried to end their lives by suicide); and *spokespeople* (i.e., advocates for suicide prevention). Eight individuals (three men, five women) consented to share their stories. All participants were encouraged to describe whatever they felt comfortable sharing regarding their experience with suicide. Only stories that were believed to activate vicarious experience, verbal persuasion, and physiological and affective states were selected.

As a source of self-efficacy, mastery experience represents a variable that cannot directly be manipulated via the interventions developed for this study. Nevertheless, mastery experience may provide an explanation for *why* there might be differences in self-efficacy outcomes between trainees. For instance, it is possible that some trainees, perhaps as a function of their occupation, may have already acquired mastery experience. These trainees may score differently (i.e., higher) in self-efficacy compared to gatekeepers who have not had previous suicide prevention experience. Conversely, perhaps gatekeepers who report higher levels of mastery experience may benefit less from the interventions developed for this study. The specific role that mastery experience will play in this study remains unknown. Therefore, it is for these

reasons that mastery experience may serve as a control variable in this study and that there will be an objective measure of suicide prevention experience.

Vicarious experience represents the next source of information that was integrated into the interventions through success stories. Vicarious experience was expressed through the use of characters - individuals who can serve as role models for gatekeepers. These role models shared their suicide prevention stories and insights as: (a) individuals who have struggled with suicide ideation, (b) as family members who have lost someone to suicide, (c) as gatekeepers who were able to make a difference, and (d) as suicide prevention spokespeople. It was proposed that gatekeepers may identify with the characters in the videos by listening to and learning from their stories.

Verbal persuasion was incorporated into the videos through role models who shared their success stories. These individuals were recruited from the same community as our target audience (i.e., gatekeepers in the state of Colorado). Research suggests that gatekeepers may be more readily persuaded by individuals who are perceived as similar to themselves (e.g., Bandura, 1994; Cialdini & Goldstein, 2004; Cialdini & Trost, 1998; Silvia, 2005). These role models expressed the importance of being a gatekeeper, while sharing their suicide prevention experiences and lessons learned. Perhaps gatekeepers who were persuaded in their suicide prevention abilities would be more likely to mobilize their energy and sustain effort even in the face of real or perceived obstacles. Conversely, it is also possible that verbal persuasion may not independently be a predictor of self-efficacy after controlling for other covariates. It was expected that verbal persuasion would help enhance self-efficacy outcomes, but not independent of the other sources of information.

Lastly, in regards to physiological and affective states, personal narratives were chosen that could reduce negative attributions (e.g., anxiety, stress) and perceptions of barriers toward suicide prevention. Bandura (1994) recommends the following three techniques to counter negative physiological and affective responses toward a behavior: (a) reduce perceived stress, (b) decrease negative emotional proclivities surrounding a behavior, and (c) correct the misinterpretations surrounding emotional responses (i.e., from negative to positive attributions). Keeping these recommendations in mind, success stories were selected that were believed to meet such criteria. Hence, the goal in creating these interventions was to reduce potential anxieties toward suicide prevention behavior and reassure gatekeepers that they had the ability to apply their skills.

Elaborating further on the interventions, two similar yet distinct post-training videos were developed for this study: (a) a short video (i.e., 6 minutes, 24 seconds), and (b) a longer video (i.e., 9 minutes, 50 seconds). Both interventions were developed based on self-efficacy theory, presented the real life stories of individuals who have been affected by suicide, and are posited to promote self-efficacy. The two video interventions contained similar content and messages; yet, the length of each video varied. Another key difference between the interventions is that the shorter video contained content from spokespeople; whereas, the longer video did not include content from such individuals. Conversely, the longer intervention allocated more time for gatekeepers to share their personal stories.

Focusing on each video, the shorter intervention contained messages from two spokespeople from the community, a male and female. These community representatives shared suicide prevention information that subject matter experts believe is important to empower gatekeepers. In addition, this video included personal stories and allocated time to the following

types of individuals: (a) attempters (1 minute, 5 seconds), (b) gatekeepers (3 minutes, 8 seconds), (c) survivors (12 seconds), and (d) spokespeople (2 minutes, 10 seconds). This intervention provided both information and success stories. The majority of this video highlighted gatekeeper and spokespeople stories.

The longer video focused exclusively on the stories of people touched by suicide. This video emphasized narratives from different types of individuals: (a) those who have successfully applied their suicide prevention skills, (b) people who have previously struggled with suicide, but are happy to be alive, and (c) individuals who have lost someone close to them to suicide. The 10-minute video allocated time to the following types of individuals: (a) attempters (1 minute, 40 seconds), (b) survivors (2 minutes, 10 seconds), and (c) gatekeepers (6 minutes). Clearly, this intervention focused largely on the stories of gatekeepers.

At this point, it was difficult to determine which intervention may be better at increasing and maintaining gatekeeper self-efficacy. On one hand, the shorter video may be more effective because it included more direct suicide prevention information and spokespeople. On the other hand, the longer video have been better at helping trainees improve their self-efficacy because it included more narratives that emphasized gatekeepers' successful experiences with suicide prevention. It is also possible that both of these interventions may have been more successful at increasing self-efficacy outcomes because they were more interactive than the control webinar (Burke et al., 2006). Unfortunately, the effect sizes associated with these treatments was unknown.

Next, a control webinar intervention was developed for this study. This video was designed to provide participants with a suicide prevention exercise that could be compared to the two treatment videos. In creating a control condition, it was imperative that this video would

have minimal impact on the DV of interest (e.g., self-efficacy). Therefore, a brief, 6-minute webinar was created for this study. The content of the webinar was based on an informational PowerPoint presentation that focused on youth and adolescent suicide rates and statistics. Similar to the two treatment conditions, this control condition was in an online format. Although this control condition provided gatekeepers with suicide prevention information, no pictures or success stories were included from real individuals. Unfortunately, the effect size of this condition was unknown.

In summary, the purpose of this study was to evaluate the effectiveness of two suicide prevention interventions designed for suicide prevention gatekeepers. Both interventions utilized self-efficacy theory (Bandura, 1977) as their theoretical foundation and shared content in the form of suicide prevention success stories. It was proposed that effective interventions will bolster gatekeeper self-efficacy between the pre-test and post-test. In addition, if such treatments were successful, it was suggested that vicarious experience and physiological and affective states may help explain this phenomenon for three reasons: (a) the interventions were created based on these sources of information, (b) mastery experience may serve as a control variable rather than an IV, and (c) these variables were found to be strong predictors of self-efficacy outcomes. The following hypotheses are proposed to address the research questions posed earlier in the introduction.

Hypotheses:

Hypothesis 1: The shorter intervention (i.e., 6-minute video) will produce significantly higher levels of post-training self-efficacy compared to the control webinar between the pre-test and post-test survey.

Hypothesis 2: The longer intervention (i.e., 10-minute video) will produce significantly higher levels of post-training self-efficacy compared to the control webinar between the pre-test and post-test survey.

Hypothesis 3a: Three components of self-efficacy theory (e.g., vicarious experience, verbal persuasion, mastery experience) will be significantly and positively associated with post-training self-efficacy.

Hypothesis 3b: Physiological and affective states will be significantly and negatively associated with post-training self-efficacy.

Hypothesis 4: Vicarious experience is expected to partially mediate the relationship between treatment condition and post-training self-efficacy.

Hypothesis 5: Physiological and affective states is expected to partially mediate the relationship between treatment condition and post-training self-efficacy.

METHOD

The design for this study was a pre-test post-test quasi-experimental design. The data were collected using a web-based survey at the pre-test (i.e., before the participants were randomly assigned to a group) and at the post-test (i.e., immediately following the treatment condition) as depicted in figure 1. Missing data and outliers were identified prior to analysis. All data were collected, matched, and cleaned for analysis in this study. Descriptive statistics were run for each variable along with measures of skewness. Also, scale reliabilities and effect sizes were computed as well. The data were assessed using a between-subject and within-subject 3 (treatment) x 2 (occasions) analysis. Data were investigated using SPSS version 20 software.

Participants and Procedure

Prior to recruitment, a power analysis was performed to estimate an appropriate sample size for this study. In order to run this analysis, it was necessary to estimate an approximate effect size (e.g., Cohen's d) for self-efficacy for each treatment condition between the pre-test and post-test. Effect size estimates from a prior evaluation of QPR training were considered (Chen et al., 2009). It seemed logical to concentrate on the effect size of QPR rather than ASIST given that the latter training was much shorter (i.e., 2 hours versus 16 hours) and more similar in duration to the present 6-10 minute interventions.

The calculated effect size for the QPR evaluation data ($d = 0.77$) suggested a large effect size (Cohen, 1992) between the pre-test and post-test. Based on such findings, a similar effect size ($d = 0.75$) was estimated for this study. Given this estimate, the power analysis suggested that approximately 100 participants would need to be recruited per each condition to achieve statistical power, 0.80, at $p < 0.05$, two-tailed. Unfortunately, the database in which participants were selected contained a limited number of potential participants. In addition, previous studies

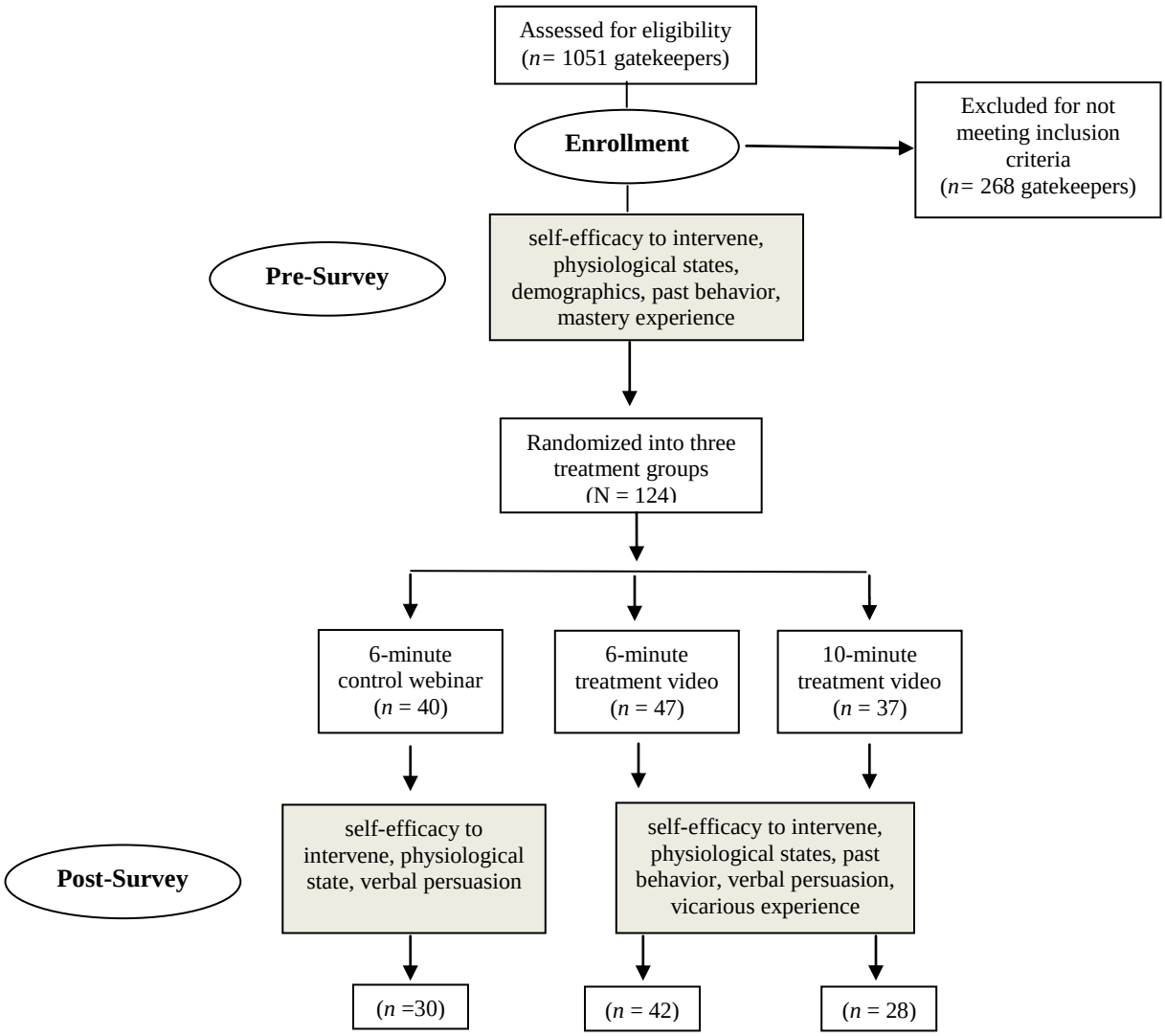

Figure 1. Research Design Diagram - Three Randomized Groups

that recruited from this database (e.g., Chen et al., 2009; Moore et al., 2011) found a low response rate (e.g., < 22%).

On one hand, Bordens and Abbot (2002) encourage researchers to select an economic sample, only enough participants to ensure a valid study. On the other hand, it was possible that not enough gatekeepers would participate in this study to adequately address all of the proposed

research questions. Therefore, given the importance of recruiting suicide prevention gatekeepers and to ensure the feasibility of this study, a large effect size was selected.

Participants were eligible for participation if they met the following three criteria: (a) took part in either QPR or ASIST training, (b) were trained between May 2009 and September 2010, and (c) provided a working email address. Individuals were recruited from a database of QPR and ASIST trainings representing six communities throughout the state of Colorado. In total, there were 1051 participants who met the first two criteria. However, numerous participants did not meet the third inclusion criteria.

To ensure that the third condition was met, a trained research assistant entered each available email address into Google (i.e., a well-known online search engine) to check whether this email address was functional. The research assistant also double-checked this email with the name provided in the participant database. Participants were excluded from this study if their email address could not be found online. Additionally, a few dozen email addresses contained typos that were corrected prior to recruitment.

After this first round of participant selection, nine hundred and thirty-one participants appeared to meet all three criteria and were sent the initial recruitment email (refer to Appendix C). Unfortunately, one hundred and nineteen participants were excluded from this next sample due to missing information, duplicate records, and / or inaccurate email addresses. Later in the recruitment process, an additional 148 participants were excluded due to invalid email addresses. Thus, a total of 783 eligible participants who presumably received a recruitment email remained after this thorough selection process.

Once participants were selected, they were randomly assigned into one of three treatment groups: (a) 6-minute video, (b) 10-minute video, or (c) 6-minute control webinar video. All

eligible participants received an invitation to participate in this study and a link to the web survey (refer to Appendix C). These participants were provided their own unique five-digit id code ranging from 10001-10931. In order to access the web survey, participants were required to enter their unique id code each time they entered the site.

For participants who did not reply within one week of this second email (i.e., non-respondents), two additional follow-up emails were sent as a friendly reminder to take part in this study (refer to Appendices D and E). These three emails were sent during the summer of 2011. Unfortunately, dozens of participants were "out of the office" during this recruitment phase. In fact, due to an initially low participation rate at the pre-test (n = 62), a new round of email invitations were sent to the remaining participants to increase response rates for the pre-test. These recruitment emails offered participants a $3 incentive to take part in this study. Participants were told that $3 would be donated on their behalf to the American Foundation for Suicide Prevention (AFSP). Three additional emails were sent in this second attempt (refer to Appendices F-H), resulting in double the participation rate for the pre-test survey (N = 124). However, due to sample attrition, response rates declined by nearly 20% by the post-test (n = 100). The final response rate for the pre-test and post-test was about 16% and 13%, respectively.

Participants were primarily female (83.1%) and were more likely to be ASIST trainees (57.3%). The mean time since respondents had taken gatekeeper training was 511 days. In addition, the range for days since initial training and participating in this study varied from 304 days to 835 days. In terms of past experience with suicide prevention, the majority of participants received no suicide prevention training within the last six months (41.9%), followed by 1-2 hours (29.8%), and 3 or more hours of training in the past six months (29.2%). In regards to direct experience with a suicide intervention in the past six months, most of the sample had no

direct experience (52.4%). In addition, participants ranged in age from 23 to 81, with a mean age of about 45 (*SD* = 13.00).

Measures

Self-efficacy. This scale was specifically developed for gatekeeper training programs and has been utilized before in suicide prevention evaluation efforts (e.g., Cigularov, Chen, Thurber, & Stallones, 2008). The scale is comprised of three items, two of which were reverse-coded, "I don't feel competent to help a suicidal person" and "I don't think I can prevent someone from suicide". The last item of this scale is positively framed, "I feel confident in my ability to help a suicidal person". These items were specifically created to measure self-efficacy to intervene with someone at risk for suicide. Participants rated their level of agreement or disagreement on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability of this scale in this sample was .61 and .65 for the pre-test and post-test, respectively.

Sources of self-efficacy. The following scales were developed specifically for the purpose of this study. To date, no previous measures were found in the context of gatekeeper training programs. Hence, these scales were guided by Bandura's self-efficacy theory (1977), items created from previous studies (e.g., Lent et al., 1991; Usher & Pajares, 2009), and input from four subject matter experts in the community. Four scales were created and measured the following sources of self efficacy: (a) vicarious experience, (b) verbal persuasion, (c) physiological and affective states, and (d) mastery experience. A list of items can be found for all scales in appendix M.

Vicarious experience was assessed by a 3-item scale. Items focused on trainees' cognitive appraisal of others' success with suicide prevention. Example items included, "Watching how others in the video have successfully helped a suicidal person makes me feel like

I can do it" and "Learning of other gatekeepers' positive experiences during the video helped me imagine successfully intervening with a suicidal person". The reliability of this scale at post-test was rather high, .94. Participants rated their level of agreement or disagreement on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Verbal persuasion was measured with a 3-item scale. Items reflected the extent to which gatekeepers were convinced that they have the ability to intervene with someone at risk for suicide. Example items included, "The presentation convinced me that I have the power to help someone in a suicidal crisis" and "The presentation convinced me that I can help suicidal individuals, just like other gatekeepers". The reliability of this scale at post-test was also high, .96. Participants rated their level of agreement or disagreement on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Physiological and affective states were measured by a six-item scale that assessed gatekeepers' anxiety and stress responses toward suicide prevention. Example items included, "Just thinking about intervening with a suicidal person makes me feel stressed" and "I get overwhelmed by the thought of intervening with a person in crisis". The reliability of this scale was .89 and .91 for the pre-test and post-test, respectively. Participants rated their level of agreement or disagreement on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Mastery experience was measured by three items that assessed gatekeepers' past experience regarding their personal accomplishments in suicide prevention. Example items included, "I have made successful referrals for individuals at risk for suicide" and "I have successfully helped individuals at risk for suicide". Because some gatekeepers may have engaged in more suicide prevention efforts, this variable was considered as a covariate for this

study. In addition, the reliability of this scale at the pre-test was .88. Participants rated their level of agreement or disagreement on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Other background information. Participants completed a brief demographic questionnaire that included items about their suicide prevention training experience. In addition, participants were asked if and what suicide prevention skills they had used in the past 6 months. This latter item provided a more objective measure of gatekeeper suicide prevention behaviors.

Data Analysis. First, age, sex, and other background information was compared between respondents and non-respondents to examine if potential biases existed, and among participants from the three treatment groups to ensure that random assignment was effective. Data were checked for duplicate entries, incomplete records, and potential outliers. Any duplicate entries were deleted. The method used to handle the missing data will be discussed shortly. Finally, outliers were examined, but all the raw data was kept in its original format.

To examine hypotheses 1 and 2, a one-way analysis of covariance (ANCOVA) was conducted controlling for pre-test self-efficacy. The purpose of this analysis was to address the following question: Was there a significant difference between groups for post-test self-efficacy outcomes? More specifically, this analysis examined whether there were any non-random differences between the three treatment groups on post-test self-efficacy. It was reasoned that if the ANCOVA was significant, this might provide support for the effectiveness of one of the interventions developed for this study.

Before results were interpreted, three key assumptions associated with ANCOVA (e.g., independence, normal distribution, homogeneity of variance) were examined. Each treatment mean was compared to the control webinar mean to determine if there were any significant

differences between groups. Results were considered significant if an alpha of .05 or less was obtained. If the omnibus F-test proved to be significant, planned comparisons (e.g., Tukey test) would be conducted to better understand the differences between groups.

In order to address hypothesis 3a and 3b, a correlation matrix was run to exam the strength of relationships between the independent variables (IVs) and dependent variable (DV). In addition, a standard linear regression (MLR) model was conducted. In this form of MLR, IVs are entered simultaneously into the model (Tabachnick & Fidell, 2007). In general, MLR measures the strength of a relationship (i.e., correlation) between multiple IVs and a DV. This statistical approach helps examine what IVs may predict or explain a DV (West, Aiken, Wu, & Taylor, 2007). For example, a group of variables may all significantly contribute to an outcome measure. Yet, MLR allows researchers to understand how each IV contributes collectively and independently to explaining variance in the DV.

Another benefit of MLR is that it allows researchers to control variables (e.g., pre-test self-efficacy, mastery experience) while examining how different IVs may contribute to the DV of interest (Tabachnick & Fidell, 2005). For this study, four sources of self-efficacy (e.g., vicarious experience, verbal persuasion, physiological and affective states, mastery experience) were proposed as possible IVs to test post-test self-efficacy.

Next, in order to examine *why* the proposed interventions might have been effective and address hypotheses 4 and 5, mediation analyses were conducted. Baron and Kenny (1986) suggested that in a mediation model, the IV (e.g., treatment condition) should cause the DV (e.g., post-training self-efficacy) via an intervening variable (e.g., vicarious experience, emotional affect). For instance, in this study, a video intervention might have enhanced vicarious experience which in turn caused post-training self-efficacy (see Figure 2). According to

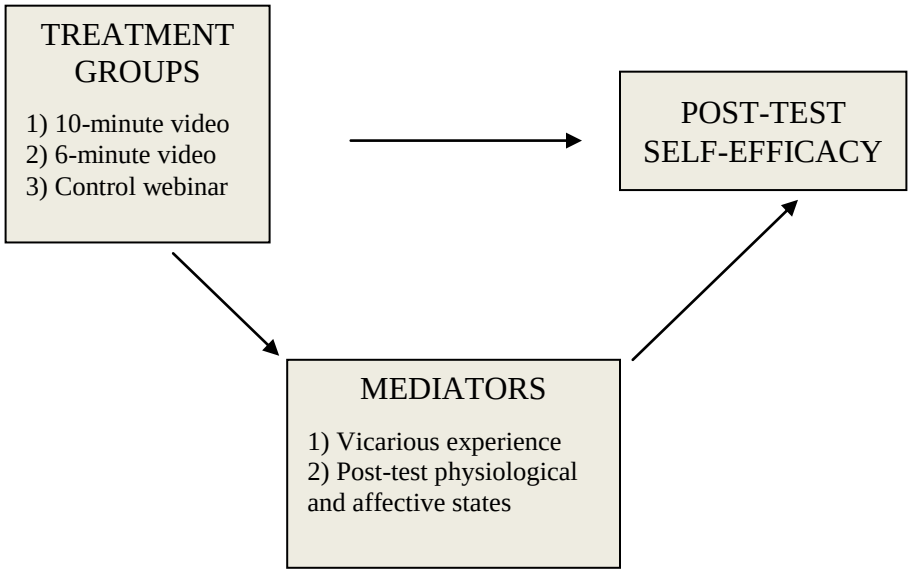

Figure 2. Proposed Mediation Models

MacKinnon (2008), mediator variables can help clarify the relationship between IVs and DVs. In fact, mediator variables can help researchers better understand the relationship between an IV and DV.

In order to test a mediation model, Baron and Kenny (1986) proposed the *causal steps approach* to mediation. This method involves the following four steps: (a) show that the IV predicts the DV, (b) demonstrate that the IV predicts the mediator, (c) show that the mediator predicts the outcome above and beyond the prediction of the IV, and lastly, (d) examine whether there is full or partial mediation. The causal steps approach has been widely disseminated and applied across studies; however, this approach has been found to be problematic as well (Hayes, 2009). For instance, this method may result in lower power estimates (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Moreover, Hayes (2009) suggested that if mediation is found between variables, the causal steps approach is less likely to detect a

significant effect between the IV and DV. Despite these limitations, the causal steps approach was the mediation method that was utilized for this study.

RESULTS

Background analysis. Means, standard deviations, minimum values, maximum values, and correlations among the study variables are presented in Table 1. The observed ranges were equal to or approached the possible ranges for all variables in the correlation matrix. Additionally, correlation coefficients were computed for 12 variables in this study, including but not limited to the SET scales between the pre-test and post-test. Nine of the eleven IVs appeared to be significantly related to post-test self-efficacy with the majority (i.e., eight variables) at an alpha level of .004 or less.

In terms of scale reliability, the majority of coefficient alphas were well over the .70 level that is recommended for research (Nunnally & Bernstein, 1994). In fact, all multi-item scales except for baseline self-efficacy ($\alpha = .61$) and outcome self-efficacy ($\alpha = .65$) achieved a coefficient alpha level of .88 or above. This suggests that almost all of the measures developed for this study displayed adequate internal consistency. Such findings may also suggest that the self-efficacy scales may have resulted in a lower than optimal reliability for this sample as defined by Cohen (1992). In addition, all scale reliabilities were computed prior to correcting for missing data which will be discussed in the following section.

Before the five hypotheses were tested, three one-way ANOVAs were conducted to examine whether random assignment had been effective. Pre-training self-efficacy, emotional affect, and mastery experience were selected for this analysis. Prior to this analysis, tests of homogeneity of variances (i.e., Levene's F statistic) were run for each one-way ANOVA. The Levene test measures the equality of variances in the three different groups that were randomly assigned in this study. When results are not significant, this suggests that the variances of the randomly selected groups appear to be drawn from the same sample. However, if the Levene

Table 1

Means, Standard Deviations, Minimum Values, Maximum Values, and Correlations

Variable	M	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	45.06	13.00	23	81	-	-.01	-.04	.04	-.05	-.01	-.07	.11	-.07	.03	.02	.06
2. Gender[a]	1.83	0.38	1	2		-	.10	-.10	.00	-.07	-.06	-.04	.12	.11	-.12	-.06
3. Initial Training[b]	1.58	0.50	1	2			-	.19*	.19*	.13	.13	.18*	-.22*	-.23*	**.26****	.23**
4. Hours of Suicide Prevention Training in Past 6 Months[c]	2.20	1.44	1	6				-	.20*	.03	.05	.04	**-.27****	-.23*	**.30****	**.28****
5. Application of Suicide Skills in Past 6 Months[d]	0.48	0.50	0	1					-	.17	-.11	-.03	**-.27****	-.23**	**.27****	.23**
6. Mastery Experience	3.91	0.88	1	5.00						-	.01	.06	-.16	-.16	**.32****	**.21****
7. Vicarious Experience	3.91	0.66	1	5.00							-	**.86****	**-.34****	-.26*	.27*	**.41****
8. Verbal Persuasion	3.74	0.76	1	5.00								-	**-.27****	**-.26****	.11	**.28****
9. Physiological and Affective States (baseline)	2.05	0.71	1.00	4.20									-	**.92****	**-.60****	**-.65****
10. Physiological and Affective States (outcome)	2.00	0.72	1.00	4.00										-	**-.60****	**-.64****
11. Self-efficacy (baseline)	3.90	0.61	2.00	5.00											-	**.69****
12. Self-efficacy (outcome)	3.97	0.56	2.33	5.00												-

Note. Data were singly imputed using the EM algorithm

[a] Male = 1, Female = 2

[b] QPR = 1, ASIST = 2

[c] 1 = 0 hours, 2 = 1-2 hours, 3 = 3-8 hours, 4 = 9-16 hours, 5 = 17-20 hours, 6 = more than 20 hours

[d] 0 = did not use skills, 1 = did use skills

* $p < .05$ (two-tailed), ** $p < .01$ (two-tailed)

Bold = Adjusted for Bonferonni correction

statistic is found to be significant, this suggests that variance of the variable significantly differs from the variance of the other groupings. Results of the Levene test indicated that pre-training self-efficacy was significant (p = .042), while pre-test physiological and affective states (p = .265) was not significant and mastery experience could be considered marginally significant (p = .080). Since pre-training self-efficacy was significant, this suggests that the participants may have begun this study with differing levels of confidence and previous suicide prevention experience. However, none of these results would be considered as significant if an alpha level of .05 was adopted for these analyses.

Therefore, since the assumption of the homogeneity of variance may have been violated for pre-training self-efficacy, the results of a Welch test [$F(2, 72.03) = 1.19$, $p = .480$] were considered before interpreting the one-way ANOVA for this variable. This statistic proved to be non-significant allowing for further interpretations of the study's means. In addition, findings for pre-test self-efficacy, $F(2, 121) = 2.27$, $p = .108$, pre-test physiological and affective states, $F(2,121) = 1.04$, $p = .358$, and mastery experience $F(2, 121) = 1.19$, $p = .309$, also proved to be non-significant.

Such results support the effectiveness of random assignment and suggest that gatekeepers began this study with similar levels of confidence, anxiety, and mastery experience in relation to suicide prevention behavior. However, because pre-test self-efficacy was significant based on Levene's statistic at an alpha level of .05, it will be controlled as a covariate for the rest of the analyses in this study. It was also reasoned that if participants begun with differing levels of self-efficacy, it seemed important to take this into account during the analyses.

Patterns of missing data. For each variable, missing data accounted for less than 19.4% of missing values. This percentage of missing values would be considered quite high for a very

short study. Moreover, initial analysis revealed that the majority of missing data were due to participant attrition between the pre-test (N = 124) survey and post-test survey (*n* = 100). In addition, 17 individuals or approximately 14% of participants had missing data for the mastery experience scale.

In examining the missing data trend, one interesting finding was that more gatekeepers completed the post-survey after being randomly assigned to the 6-minute treatment video than any of the other options. More specifically, approximately 25% of participants withdrew from the study for both the 6-minute control webinar and 10-minute treatment video. However, only 11% of gatekeepers withdrew from the 6-minute treatment video.

The reasons behind these patterns of missing data or mechanisms of missingness (Graham, 2008) were unknown prior to analysis. One could speculate that the 24 post-test participants chose not to take part in the follow-up study. Yet, it may also plausible that these individuals had something in common that made them more likely to drop out of the study. Tabachnick and Fidell (2007) argued that the pattern of missing data is more important than the amount of data missing. Therefore, in order to determine how best to handle the missing data, it was important to examine whether these data values were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR).

MCAR refers to instances in which: (a) the probability of a missing value is unrelated to the values of other variables, and (b) these missing values are distributed randomly between variables. Conversely, MAR is a special instance of MCAR in which missing data may vary as a function of some third variable. For this type of missing data, missingness only pertains to variables within the current dataset (Schafer & Graham, 2002) and these variables are included in the missing data model. Lastly, MNAR reflects patterns of missing data that are: (a)

systematic, (b) can be influenced by unobserved data (Graham, 2008), and (c) the missingness is related to the DV. This pattern of missing data can be problematic because it may produce biased sample parameter estimates (Little & Rubin, 2002; Roth, 1994).

A number of researchers (e.g., Acock, 2005; Graham, 2008; Little & Rubin, 2002; Schafer & Graham, 2002; Roth, 1994) emphasized the importance of classifying patterns of missing data as it helps select appropriate strategies for analysis. Following this recommendation, three patterns of missing data were examined for cases with: (a) at least one missing data value (n = 38), (b) at least one missing value for the mastery experience scale (n = 17), and (c) at least one missing item from the post-test survey (n = 24).

After careful consideration of the missing data trends , the post-test group was selected as the main group for patterns of missing data. It was posited that the majority of gatekeepers in this group may have systematically *chosen* not to complete this voluntary survey. Various binary logistic regression models were run to estimate the pattern of missing data at the post-test (e.g., Peng, Lee, & Ingersoll, 2002; Sweet & Grace-Martin, 2002). Therefore, key demographic variables were compared between respondents who were missing data at the post-test and those who were not missing this data at the post-test.

The following variables were examined and found not to be significantly related to missing items on the post-test: (a) initial training (χ^2 = 1.572, df = 1, p = .210), (b) hours of previous suicide prevention training in the past six months (χ^2 = 0.207, df = 1, p = .649), (c) past experience with suicide prevention in the past six months (χ^2 = 0.419, df = 1, p = .210), (d) days between initial training and intervention (χ^2 = 1.753, df = 1, p = .185), (e) gender (χ^2 = 1.272, df = 1, p = .517), (f) age (χ^2 = 3.613, df = 1, p = .057), (f) pre-test physiological and affective states (χ^2 = 0.001, df = 1, p = .982), (g) pre-test self-efficacy (χ^2 = 0.743, df = 1, p = .389), and (h)

mastery experience (χ^2 = 0.210, df = 1, p = .647). Age was found to be marginally related to post-test self-efficacy in which younger participants appeared to be more likely to drop out of the study. However, when a Bonferroni correction was applied to the p-values, none of the variables were found to be statistically significant.

Such findings suggest that the observed demographic and behavioral variables in this study were not statistically significant between gatekeeper respondents and non-respondents at the post-test. Supporting these results, the SPSS missing values analysis (MVA) in which Little's MCAR test was conducted (i.e., a statistic that examines all patterns of missing data), supports that the data were most likely MCAR (χ^2 = 80.56, df = 88, p = .701). However, a limitation of these analyses is that the data may have been missing as a function of variables that were not measured in this study. Therefore, for the sake of selecting an appropriate missing data method and in keeping with a conservative pattern of missing data, the data will be considered MAR.

Various missing data methods (e.g., deletion, single imputation, model-based procedures) were considered. Additionally in selecting a missing data method, three criteria were taken into account: (a) parsimony, (b) robustness, and (c) a method that maintained power (Roth, 1994). Before a missing data method was chosen, different algorithms were run to compare and contrast results. What follows next is a brief discussion of the three missing data methods that were considered for this study.

First, missing data methods in which cases would need to be deleted (e.g., listwise deletion, pairwise deletion) were eliminated for a number of reasons. For example, such methods would decrease the already small sample size and reduce the study's power. In addition, many researchers (e.g., Acock, 2005; Graham, 2008; Raghunathan, 2004; Rubin, Witkiewitz,

Andre & Reilly, 2007) have found that listwise deletion can result in some major methodological limitations (e.g., overestimating or underestimating case values, loss of power, inaccurate correlations) and is the least robust option available (Myrtveit, Stensrud, & Olsson, 2001; Rubin et al., 2007). Conversely, pairwise deletion has been found to be a more accurate missing data method (Roth, 1994); however, this approach may still be affected by similar limitations. Therefore, deletion missing data methods were not selected for this study.

The mean substitution approach (i.e., mean imputation) was also considered. It is a single imputation technique that is commonly used to handle missing data (Rubin et al., 2007). Mean imputation uses an algorithm in which missing data are replaced with the observed mean for a particular variable. This method allows researchers to maintain all cases within a sample (i.e., maintaining statistical power) while producing internally consistent results (Anderson, Basilevsky, & Hum, 1983; Roth, 1994).

Support for this method has been mixed (Roth, 1994). On one hand, researchers (e.g., Chan & Dunn, 1972; Chan, Gilman, & Dunn, 1976; Raymond & Roberts, 1987; Rubin et al., 2007) have found that mean imputation is more accurate than listwise and pairwise deletion. On the other hand, other researchers (e.g., Garcia-Laencina, Sancho-Gomez, & Figueiras-Vidal, 2009; Little & Rubin, 1989; Schafer & Graham, 2002) have found that mean substitution can bias the distribution of a variable (e.g., variance, confidence intervals) by pulling estimates closer toward zero while underestimating the standard deviation and error of a variable. Thus, this method was not selected for this study.

Lastly, the expectation maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977), which is another single imputation algorithm was considered. EM is an iterative model-based procedure in which missing values are estimated based on maximum likelihood estimates and a

new dataset is created based on the observed relationships among variables (Graham, 2009; Enders, 2001; Little & Rubin, 1987; Tabichnick & Fidell, 2007). The EM approach is a two-step iterative process in which missing data is first estimated and then a maximum-likelihood estimation that is based on the observed data and the missing data parameters is used to estimate the missing values (Roth, 1994).

In the first step of this process, missing values are substituted from the predicted values derived from various regression equations (Enders, 2001). In addition, the cross products and sums of squares of the estimates are calculated using both the observed and imputed data (Enders 2001). In the maximization step of the process, data that was estimated from the first step is utilized to estimate regression coefficients and a covariance matrix of the newly complete dataset. According to Little and Rubin (1987), multiple iterations can occur as the missing data values are recalculated based on the observed and re-estimated data parameters. This process, estimating from the e-step and m-step continues until there is convergence in the parameter estimates (Enders, 2001; Little & Rubin, 1987; Roth, 1994).

One advantage of the EM approach is that unlike mean imputation or deletion methods, this approach injects a degree of random error into the estimates to account for the uncertainty of the estimates (Acock, 2005). In fact, some researchers (e.g., Acock, 2005; Tabachnik & Fidell, 2007) suggest that SPSS (i.e., statistical software program) introduces some error into its estimates which adjusts the missing values slightly. However, with this approach, EM tends to underestimate the standard error, thus overestimating the level of precision of its estimates (Acock, 2005). In addition, as Graham (2003) noted, EM can be biased because it does not factor in error to the overall dataset.

In general, there is support in the literature for this method (e.g., Acock, 2005; Raghunathan, 2004; Rubin et al., 2007; Schafer & Graham, 2002). For instance, Acock (2005) suggested that EM is a superior approach to other traditional missing data methods (e.g., deletion, mean imputation). In addition, EM is one of the more popular and widely applied maximum likelihood methods (Raghunathan, 2004). Furthermore, Rubin and colleagues (2007) found that compared to listwise deletion and mean substitution, this method better estimated the missing data parameters when more than 5% of the data were missing. Thus, for the purpose of this study, SPSS was utilized to run an EM algorithm and handle the missing data.

Hypotheses results. For hypotheses 1 and 2, a one-way ANCOVA was conducted controlling for pre-test self-efficacy. Hours of suicide prevention training in the past six months was also considered as a covariate because it was found to be significantly related to post-test self-efficacy (refer to Table 1). However, when this variable was added to the analyses, overall results remained the same. Therefore, this variable was not included as a covariate in the final models.

Although mastery experience and pre-test physiological and affective states were significantly correlated with the DV, these potential covariates were excluded from the ANCOVA. This decision was made because only pre-test self-efficacy was found to be statistically significant during the Levene test and it was desirable to maintain parsimony within the data analysis. Furthermore, variables such as past experience with suicide prevention training in the past six months and type of initial training (e.g., QPR or ASIST) were not included in the final models because they did not appear to significantly correlate with post-training self-efficacy once the Bonferroni correction had been applied (refer to Table 1). The

Bonferroni correction was calculated by taking the designated alpha level (i.e., .05) and dividing that number by 12 (i.e., the number of variables in the correlation matrix).

Tabachnik and Fidell (2007) recommend choosing covariates that are strongly associated with the DV, but not to each other. Additionally, these researchers emphasize how the goal of this statistical approach is to make appropriate adjustments to the DV with minimal loss of degrees of freedom. Therefore, the minimal number of covariates was selected for the present study.

Results from the one-way ANCOVA revealed that neither hypothesis 1 nor 2 was supported ($F(2, 120) = 0.07$, $p = .935$, $\eta_p^2 = .001$). That is, gatekeepers who watched the 6-minute ($M = 4.03$, $SD = 0.58$) or the 10-minute treatment video ($M = 3.85$, $SD = 0.63$) did not have significantly higher levels of post-training self-efficacy compared to the control group ($M = 4.03$, $SD = 0.73$). When an ANCOVA was run which compared either treatment groups to the control group, a similar effect was found ($F(1, 121) = 0.01$, $p = .913$, $\eta_p^2 = .000$). Such findings suggest that the treatments created for this study, whether independently assessed or collectively assessed did not produce significantly different mean scores in post-test self-efficacy compared to the control condition (refer to Table 2).

Follow-up analyses were conducted to examine whether there may have been within-group differences in self-efficacy scores between the pre-test and post-test. Unfortunately, when paired sample t-tests were conducted using the data the was imputed from the EM method, none of the groups produced a significant change between pre-test and post-test self-efficacy scores (refer to Table 2). In addition, when a 2-way repeated ANOVA was run to test within-subject effects, the interaction between treatment group and self-efficacy proved to be non-significant ($F(2, 121) = 0.36$, $p = .913$, $\eta_p^2 = .006$). Such findings indicate that self-efficacy did not

significantly change between the pre-test and post-test within subjects. However, change in self-efficacy between the pre-test and post-test, regardless of group membership, was marginally significant ($F(1, 121) = 3.45$, $p = .066$, $\eta_p^2 = .028$). Yet, even if these results were significant, such findings would only explain a very small portion of change in self-efficacy scores.

Table 2
Self-efficacy Pre-test and Post-test Values within Groups

Treatment Group	r	N	Pre-test Mean	SD	N	Post-test Mean	SD	t	*p*
6-minute video	.66**	47	3.96	0.57	47	4.03	0.58	-1.04	0.31
10-minute video	.69**	37	3.72	0.74	37	3.85	0.63	-1.41	0.17
Control webinar	.72**	40	4.00	0.51	40	4.03	0.73	-0.63	0.54

Note. Data were singly imputed using the EM algorithm
* $p < .05$ (two-tailed), ** $p < .01$ (two-tailed)

Effect size estimates were run with the observed data ($n = 100$) for each group based on Cohen's (1992) classification system. Results suggest that the effect size for each group independently was rather modest: (a) control group ($d = 0.19$), (b) 6-minute intervention ($d = 0.17$), and (c) 10-minute intervention ($d = 0.20$). Although the effect size estimate was different for each group, such differences were marginal and may be too small to be meaningful.

Hypothesis 3a and 3b were first examined by computing correlation coefficients among demographic items, past behavior, self-efficacy, and SET variables (refer to Table 1). As recommended by Collis and Rosenblood (1985), the Bonferroni approach was applied to control for potential type 1 errors since conducting multiple comparisons can produce inflated significance among coefficients. Using this approach, only *p* values that were less than .004 were considered significant. In total, 20 correlations were significant (refer to Table 1).

Results from the correlation matrix support the significance between vicarious experience ($r = .41$, $p < .004$), mastery experience ($r = .21$, $p < .004$), verbal persuasion ($r = .28$, $p < .004$), and physiological and affect states ($r = .65$, $p < .004$) to post-training self-efficacy outcomes (refer to Table 1). To reiterate, all four components of self-efficacy theory were found to be significantly related to post-test self-efficacy. In addition, vicarious experience and verbal persuasion were found to be highly and significantly correlated to each another ($r = .86$, $p < .01$). This finding may suggest potential issues with multicollinearity. Thus, prior to MLR analysis, a variance inflation factor (VIF) was computed to determine whether multicollinearity may be an issue in subsequent MLR models.

Results from the VIF analysis were inconclusive. On one hand, the values for verbal persuasion (VIF = 3.90) and vicarious experience (VIF = 3.83) did not exceed a value of 10 which is often used as a cut-off point in the literature. On the other hand, some researchers suggest using a more conservative estimate, one in which multicollinearity may be a problem if the VIF exceeds a score of 2.50. Given that there may be issues of multicollinearity between verbal persuasion and vicarious experience, it was decided that two MLR models would be run to account for this potential issue. One model included all four SET predictors as was intended for this study. The second model excluded verbal persuasion as it had received less support in the literature and to determine whether this model may be more parsimonious.

First, to examine hypotheses 3a and 3b, a multiple linear regression (MLR) model was run that included the four IVs of self-efficacy theory and the DV post-test self-efficacy. Given the nature of this study, a standard multiple regression model was computed (Tabachnick & Fidell, 2007). In this approach, all the IVs were added to the regression model simultaneously and each IV was evaluated independently as it added to the prediction of the DV. Hypothesis 3a

posited that vicarious experience, verbal persuasion, and mastery experience would be significantly and positively associated with post-training self-efficacy. Hypothesis 3b posited that physiological and affective states would be significantly and negatively associated with post-test self-efficacy.

Overall, the MLR model of post-test self-efficacy was found to be significant, $R^2 = .58$, adjusted $R^2 = .56$, $F(4, 83) = 27.12$, $p < .01$ (refer to Table 3). This model accounted for approximately 56% of the variance in post-test self-efficacy scores. In terms of unique contributions of each IV to the model, only post-test physiological and affective states ($\beta = -.644$, $p < .01$) was found to significantly predict post-test self-efficacy. However, vicarious experience was found to be marginally significant ($\beta = .276$, $p = .057$).

Next, a second model was run in which pre-test self-efficacy was added as a potential covariate. The results of this model were also statistically significant, $R^2 = .63$, adjusted $R^2 = .61$., $F(5, 83) = 11.90$, $p < .01$ (refer to Table 3). This new model helped explain 61% of the variance in post-test self-efficacy scores. In addition, both pre-test self-efficacy ($\beta = .338$, $p < .01$) and post-test physiological and affective states ($\beta = -.433$, $p < .01$) were found to independently contribute to the model.

It should be noted that this analysis focused on the data from the two treatment conditions rather than the control condition. For example, the control condition survey excluded the vicarious experience items. Therefore, for the most part, an MLR model which included verbal persuasion provided support for the IVs chosen for this analysis. Refer to Table 3 for greater detail regarding the contribution and beta weights of each IV in this model.

When verbal persuasion was excluded from the MLR, findings remained pretty similar to the prior analysis that included all four components of self-efficacy theory. For example, the

Table 3
Effects of Self-efficacy Theory on Post-test Self-efficacy

Model	Variable	*B*	*SE B*	β	t	ΔR^2	R^2
1	Intercept	3.96	0.38		10.34**		.56**
	Mastery Experience	0.08	0.05	0.12	1.66		
	Vicarious Experience	0.26	0.13	0.28	1.93		
	Verbal Persuasion	-0.05	0.13	-0.06	-0.41		
	Physiological and Affective States (outcome)	-0.55	0.07	-0.64	-8.42**		
2	Intercept	2.63	0.53		4.98**	.05**	.61**
	Mastery Experience	0.03	0.05	0.05	0.68		
	Vicarious Experience	0.12	0.13	0.13	0.96		
	Verbal Persuasion	0.07	0.13	0.07	0.52		
	Physiological and Affective States (outcome)	-0.37	0.08	-0.43	-4.60**		
	Self-efficacy (baseline)	0.31	0.09	0.34	3.45**		

** $p < .01$, * $p < .05$

first model which included the other 3 IVs was found to be significant, $R^2 = .58$, adjusted $R^2 = .56$, $F(3, 83) = 36.48$, $p < .01$ (refer to Table 4). This model explained 56% of the variance in post-test self-efficacy. In addition, both post-test physiological and affective states ($\beta = -.641$, $p < .01$) and vicarious experience ($\beta = .227$, $p < .01$) were found to significantly and uniquely contribute to this model.

Next, a second model was run in which pre-test self-efficacy was added as a potential covariate. The results of this model were also statistically significant, $R^2 = .63$, adjusted $R^2 = .62$, $F(4, 83) = 34.08$, $p < .01$ (refer to Table 4). This model explained more variance in post-test self-efficacy scores than the first model, 62% to be exact. In addition, three of the four IVs in this model were found to uniquely contribute to the model. More specifically, pre-test self-

efficacy (β = .325, p <.01), post-test physiological and affective states (β = -.445, p <.01), and vicarious experience (β = .196, p <.01) were found to independently contribute to the model (refer to Table 4).

Table 4
Effects of Self-efficacy Theory on Post-test Self-efficacy without Verbal Persuasion

Model	Variable	*B*	*SE B*	β	t	ΔR^2	R^2
1	Intercept	3.94	0.38		10.42**		.56**
	Mastery Experience	0.08	0.05	0.12	1.63		
	Vicarious Experience	0.21	0.07	0.23	3.00**		
	Physiological and Affective States (outcome)	-0.55	0.07	-0.64	-8.46**		
2	Intercept	2.71	0.50		5.37**	.06**	.62**
	Mastery Experience	0.04	0.05	0.06	0.82		
	Vicarious Experience	0.18	0.07	0.20	2.75**		
	Physiological and Affective States (outcome)	-0.38	0.08	-0.44	-4.88**		
	Self-efficacy (baseline)	0.30	0.09	0.33	3.45**		

** p < .01, * p < .05

In consideration of both MLR models, it appears that hypothesis 3a was partially supported and hypothesis 3b was fully supported. In regards to hypothesis 3a, the three or four components of self-efficacy theory combined helped explain a significant portion of post-test self-efficacy outcomes (e.g., between 56% and 62%). When the IVs were assessed independently, the data seemed to support the unique contributions of both post-test physiological and affective states and vicarious experience. These results demonstrate that collectively SET helps explain changes in gatekeepers self-efficacy scores, partially supporting hypothesis 3a. In addition, such findings fully support hypothesis 3b in which physiological and

affective states was posited to significantly and negatively predict post-test self-efficacy outcomes.

Before hypotheses 4 and 5 could be examined, the causal steps approach to mediation was first tested (Baron & Kenny, 1986). To determine whether the four criteria were met, correlation analyses were conducted between: (a) treatment group, (b) vicarious experience, (c) post-test physiological and affective states, (d) post-test self-efficacy (refer to Table 5). Results suggest that the mediation model for these variables could not be tested because the first criteria of Baron and Kenny's (1986) model was not met. More specifically, the treatment group was not significantly related to post-training self-efficacy ($r = .13$, $p > .05$). In addition, treatment group was not significantly related to either vicarious experience ($r = .02$, $p > .05$) or emotional affect ($r = .10$, $p > .05$). Because the treatment was not related to the proposed mediators, hypotheses 4 and 5 could not be tested.

Table 5
Correlations for Mediation Variables: Physiological and Affect States and Vicarious Experience

Variable	1	2	3	4
1. Treatment Group	-	.02	.10	.13
2. Vicarious Experience		-	-.26*	**.41****
3. Physiological and Affective States (outcome)			-	**-.64****
4. Self-efficacy (outcome)				-

Note. Data were singly imputed using the EM algorithm
Bold = Adjusted for Bonferonni correction
* p < .05 (two-tailed), ** p < .01 (two-tailed)

DISCUSSION

This study began with two main objectives. First, we examined whether providing gatekeepers with a post-training intervention based on self-efficacy theory might significantly increase trainees' self-efficacy toward suicide prevention. Second, the four components of self-efficacy theory were further investigated as factors that might predict changes in self-efficacy outcomes. In the following section, findings from this study will be further discussed, along with implications, limitations, and future directions surrounding these results.

First, this study found that the type of intervention that gatekeepers received had little impact on their self-efficacy scores. Indeed, the sample data does not support both hypotheses 1 and 2. Neither treatment video produced significantly higher levels of post-training self-efficacy compared to the control condition. The null findings from this study parallel Wyman and colleagues' (2008) null findings as well. In both instances, providing gatekeepers with a post-training intervention proved to be ineffective.

One plausible explanation for these null findings is that the control webinar may not have effectively served its purpose as a control condition. For instance, the effect size estimates of post-training self-efficacy for each condition were all modest in size. This trend parallels findings from Blume and colleagues' (2010) meta-analysis in which small effect sizes were found between pre-training (r = .22) and post-training (r =. 19) self-efficacy after controlling for common method biases.

This finding may indicate that all three post-training interventions had a similar effect on the DV (e.g., post-training self-efficacy). This possibility may be supported by the marginally significant within subject findings for self-efficacy over time. Similarly, scores on emotional affect decreased between the pre-test and post-test for all three groups. In addition, this variable

was found to uniquely contribute to the MLR of self-efficacy outcomes. Therefore, such results may indicate that each intervention reduced gatekeepers' anxiety toward suicide prevention behavior which helped to increase their confidence.

Another explanation is that the control webinar increased self-efficacy scores by refreshing gatekeepers' knowledge about suicide prevention. For instance, although this control webinar was not in a success story format, it did contain statistics regarding adolescent suicide behavior. One could argue that suicide prevention statistics could enhance gatekeepers' suicide prevention knowledge which in turn could influence their post-training self-efficacy. In support of this claim, Slater and associates (2002) found that three different types of interventions (e.g., conversational, testimonial, didactic) had similar effects on self-efficacy in the context of nutrition behavior. These findings are similar to the results of this study in which there were no significant differences in self-efficacy outcomes between groups.

Another possible explanation for these null findings is that they may be the result of a testing effect. A testing effect describes a situation in which changes in test scores are not the result of an intervention, but rather due to participants receiving the same survey and learning to provide what they perceive as the right answers. This threat to interval validity is a common concern for pre-test and post-test design studies. Indeed, it is possible that changes in self-efficacy between pre-test and post-test could be attributable to a testing effect. This might help explain why there were no significant differences in self-efficacy between or within groups. However, although participants received some of the same survey items as they did in the pre-test (e.g., self-efficacy, physiological and affective states, past experience) there were some changes in how the surveys were administered and what questions were asked (e.g., intervention assignment, inclusion of vicarious experience).

From a theoretical perspective, the theory of planned behavior (TPB; Ajzen, 1991) and self-efficacy theory (SET; Bandura, 1977) may help explain the null findings for hypotheses 1 and 2. First, with TPB, knowledge is proposed to influence the following variables: (a) attitudes toward a behavior, (b) subjective norms, and (c) perceived behavioral control (i.e., self-efficacy), which in turn can predict behavioral intention and actual behavior. If the information provided in the webinar activated trainees' suicide prevention knowledge, TPB suggests that this may have contributed to their self-efficacy. In addition, within SET, the four components of this theory *are* sources of information that shape individuals' perceptions about their capabilities (Bandura, 1977; 1997; Strecher et al., 1986). Perhaps statistics or facts represent another form of information that could help explain variance in self-efficacy outcomes. Hence, it is plausible that the control webinar may have influenced post-test self-efficacy scores through the information that was conveyed.

Results from the follow-up analyses do not provide support for within-treatment effects for each condition. Although self-efficacy increased among all conditions between the pre-test and post-test, this change was not found to be significant (refer to Table 2). However, results suggest that there was a marginal within subject effect for self-efficacy. Therefore, this may be a direction for future researchers to explore given the interventions developed for this study.

Another interesting finding from the follow-up analyses is that the length of time between gatekeepers' initial training (i.e., QPR or ASIST) and receiving a post-training intervention did not appear to influence self-efficacy scores. In fact, there were no significant differences between trainees who had taken gatekeeper training over two years ago and 9 months prior to this study. This trend remained consistent even when controlling for gatekeepers' initial training. While this finding is unrelated to the present study, perhaps future researchers may want to

further explore the optimal time in which to provide gatekeepers with a post-training intervention to sustain the effect of gatekeeper training.

Findings from this study partially support hypothesis 3a and fully support hypothesis 3b. For example, results from the correlation analysis demonstrate that all four components of SET were significantly related to post-test self-efficacy (refer to Table 1). In addition, hours of suicide prevention training in the past 6 months, pre-test self-efficacy, and pre-test physiological and affective states were also significant as well. These finding remained significant even when a Bonferroni correction was applied to the results. Further, the strength of the relationship between these IVs would be considered either moderate or large in size (Cohen, 1992).

In the past, researchers (e.g., Lent et al., 1991; Matsui et al., 1990) examined the four predictors of self-efficacy theory in the following order: (a) mastery experience, (b) vicarious experience, (c) verbal persuasion, and (d) physiological and affective states. These researchers examined how these IVs predicted self-efficacy using a hierarchical linear regression model (Tabachnick & Fidell, 2007). However, as Usher and Pajares (2006) noted, applying this order to every SET study may produce inconsistent findings. For instance, mastery experience may not always be the most robust predictor of self-efficacy. Therefore, a priori, this study made no direct predictions regarding the relative strength of each of the IVs in the context of sustaining the effect of gatekeeper training. What was observed from this specific dataset is that physiological and affective states and vicarious experience may be more robust predictors of self-efficacy outcomes in the context of gatekeeper training with the participants that were selected for this study.

The findings of this study may also provide support for the application of self-efficacy theory in the context of gatekeeper training. For instance, these results are in line with findings

from previous studies (e.g., Anderson & Betz, 2001; Britner & Pajares, 2006; Lent et al., 1991; Joët, Usher, & Bressoux, 2011; Matsui et al., 1990) that found that the four sources of information were strongly and significantly correlated to each other and self-efficacy. For example, consistent with Bandura's self-efficacy theory (1997), various researchers (e.g., Lent et al., 1991; Matsui et al., 1990; Usher & Pajares, 2008) have found significant correlations amongst the four sources of information ranging from .20 to .78. For this study, correlations between the four sources of information were within this range: 21 to .64. These findings are not surprising given that many studies have found that these predictors are usually inter-correlated with each other (Usher & Pajares, 2006).

In regards to vicarious experience, a predictor variable that was able to be manipulated in this study, the fact that this variable appears to have been a significant predictor of post-test self-efficacy is unsurprising. Vicarious experience has been posited and found to be an influential predictor of self-efficacy across a number of studies (e.g., Bandura, 1986; 1997; Klassen, 2004; Luzzo et al., 1999; Matsui, 1990). For example, Bandura (1977) argued that, "Seeing others perform threatening activities without adverse consequences can generate expectations in observers that they too will improve if they intensify and persist in their efforts" (p. 197). Therefore, perhaps when gatekeepers heard stories from real people about their suicide prevention experiences, this made the trainees feel more empowered in their own ability. Findings from Moore and associates (2011) suggest that one common situational obstacle for gatekeepers to apply their suicide prevention skills is a lack of an opportunity to use their skills. Therefore, it seems logical to posit that vicarious experience may be an especially important predictor for gatekeepers who have not had the opportunity to apply their suicide prevention skills after training.

In terms of post-test physiological and affective states, it was found to be significant and negative predictor of self-efficacy. Results from the MLR indicate that this variable significantly added to our understanding of factors that help explain variance in post-test self-efficacy even when controlling for other potential IVs. Such findings indicate that gatekeepers with higher levels of anxiety toward suicide prevention also had lower levels of confidence in their suicide prevention abilities. This finding seems to make intuitive sense - gatekeepers who report lower levels of anxiety toward suicide prevention training should be more likely to feel confident in their suicide prevention skills. As mentioned previously, some researches (e.g., Anderson & Betz, 2001; Matsui et al., 1990; Pajares et al., 2007) have found this variable to be a significant predictor of self-efficacy. For this reason, gatekeeper post-training interventions may be more effective if they reduce gatekeepers' anxiety toward suicide prevention.

Consistent with findings in the literature (e.g., Bandura, 1977; Lent et al., 1991, Matsui et al., 1990; Strecher et al., 1986; Usher & Pajares, 2006), mastery experience proved to be significantly related to post-test self-efficacy (refer to Table 1). Contrary to expectation, mastery experience was not found to differ among gatekeepers at the onset of the study so there was no reason to control this variable as a potential covariate. However, findings from the MLRs indicate that mastery experience did not independently contribute to the variance in self-efficacy outcomes. Thus, mastery experience may have been an important variable to measure, but its contribution to explaining self-efficacy may have been lost compared to the other IVs in the model.

Consistent with previous studies (e.g., Cordero et al., 2010; Tschannen-Moran & McMaster, 2009; Wise & Trunnell, 2001) verbal persuasion appeared to be weakly related to post-test self-efficacy. In addition, verbal persuasion shared a very large, significant, and

positive relationship with vicarious experience. Unfortunately, it is difficult to conclusively determine whether such results were a function of multicollinearity. On one hand, the verbal persuasion scale reliability was relatively high and would be considered acceptable. On the other hand, it is possible that the items from the vicarious experience and verbal persuasion scales may have represented a similar construct. For example, both scales focused on how something or some person helped a gatekeeper feel more confident regarding their suicide prevention abilities (refer to Appendix M). Further supporting this possibility, when items from both scales were analyzed together as one six-item scale, their scale reliability increased. Therefore, future researchers may need to further validate the scales developed for this study in the context of gatekeeper training.

It is interesting to note that when the two different MLR models were run, one with verbal persuasion and one without this variable, that the overall variance explained in self-efficacy was comparable (refer to Tables 3 and 4). In fact, the model that excluded verbal persuasion explained 1% more variance in self-efficacy than the other model (refer to Table 3). What is more interesting is that vicarious experience became an independent predictor of self-efficacy after verbal persuasion was excluded from this model (refer to Table 4). Therefore, such findings may support the possibility that verbal persuasion and vicarious experience may have suffered from multicollinearity. In addition, it is also possible that verbal persuasion may be a less useful IV in predicting self-efficacy outcomes. Therefore, in considering which model to select, the model that excludes verbal persuasion may be a better choice because it is the more parsimonious option.

Hypotheses 4 and 5 were not supported by the data analysis. Both vicarious experience and physiological and affective states did not appear to mediate the relationship between

treatment group and post-training self-efficacy. In fact, the treatment group variable was unrelated to both of the proposed mediators and post-test self-efficacy. Indeed, according to Barron and Kenny (1986) and their causal steps model, such results would not meet their criteria to support mediation. This finding is unsurprising given the null results of hypotheses 1 and 2. Yet, considering that this is one of the first studies to develop post-training interventions to sustain gatekeepers' self-efficacy after training, such results suggest a need for more research in this area.

The results of this study provide a few unique contributions to the SET and gatekeeper literature. First, this study developed scales specific for gatekeeper training programs. To date, no other studies that have applied this theory have done so in this context. Next, in the majority of studies (e.g., Bandura, 1986; 1997; Britner & Pajares, 2006; Lent et al., 1991; Matsui et al., 1990; Usher & Pajares, 2008) mastery experience was found to be the most robust predictor of self-efficacy. However, this was not the case in this study. Mastery experience, though significantly related to post-test self-efficacy, did not independently add to the variance explained by the MLR models. Vicarious experience and physiological and affective states were found to significantly and independently contribute to self-efficacy. Lastly, the results of this study suggest that collectively, self-efficacy theory may help explain gatekeepers' self-efficacy. Therefore, the results of this study support the application of SET in the context of gatekeeper training.

Implications. This is one of the first studies to be conducted in the field of suicide prevention training in which post-training interventions were developed and evaluated in an effort to sustain the effect of gatekeeper training. Given the number of lives lost to suicide, the direct and indirect costs associated with such loss, coupled with recent findings in the literature

(Chen et al., 2009; Keller et al., 2009) that suggest that gatekeepers may lose their confidence after training, this study was a crucial first step toward improving suicide prevention efforts. Our findings provide support for the application of self-efficacy theory in the context of suicide prevention self-efficacy of gatekeepers.

A number of researchers (e.g., Bandura, 1986; 1997; Lee, Arthur, & Avis 2008; Luzzo et al., 1999) posit that a combination of the four sources of self-efficacy may be most likely to produce optimal results in self-efficacy outcomes. This study supports this claim, finding that the combination of vicarious experience, physiological and affective states, and mastery experience were better able to predict variance in self-efficacy outcomes than each source independently. Given that each of the groups had a change is self-efficacy between the pre-test and post-test, it seems possible that each of the treatments might have a positive effect on gatekeepers' confidence after training. Therefore, it may be better to offer trainees something once they have finished their gatekeeper training, than nothing at all. For instance, the within treatment effects were marginally significant and this should not be ignored.

Limitations. Although this study contributes to our understanding of how to maintain the effect of suicide prevention training, several methodological limitations must be considered regarding this research. First, the results may not be able to be generalized to all suicide prevention gatekeepers. For instance, the response rate obtained for this study was especially low. In total, approximately 16% of the recruited sample completed the pre-test survey and about 13% of this total sample finished the post-test survey. In addition, participants who were assigned to the 6-minute treatment video were more likely to take part in the post-test survey. Therefore, it seems possible that the type of treatment that gatekeepers were offered may have influenced their likelihood to participate in the follow-up study.

While a number of researchers (e.g., Cook, Heath, & Thompson, 2000; Manfreda, Bosnjak, Berzelak, Haas, & Vehovar, 2008; Shin & Fan, 2008) have found that web-based surveys have lower response rates than mail surveys, the response rates for this particular study was especially low. For instance, in a meta-analysis concerning internet-based response rates, Cook and colleagues (2000) found a mean response rate of 34.6% for online surveys. Other researchers (e.g., Fan & Yan, 2010; Shin & Fan, 2008) have found similar trends in their meta-analyses comparing web and mail-based surveys.

With such low response rates, it may be important to examine what factors contribute to higher response rates from the literature. According to Shin and Fan (2008) who examined such factors between web-based surveys and mail surveys, follow-up reminders appeared to have less of an impact for participants in web-based surveys. In addition, certain population types (e.g., professionals, employees, general population) are much less likely to respond to online surveys. For instance, Ansel, Lievens, Schollaert, and Choragwicka (2010) concluded that the effectiveness of response rate techniques depended on the type of respondents.

Another issue associated with lower response rates is that they negatively influence the generalizability of a study by introducing non-response biases. For example, one could argue that these interventions may have been more or less effective for gatekeepers who chose not to participate in this study. Indeed, gatekeepers who were less confident in their suicide prevention abilities may have lacked the self-efficacy to participate in this study. Supporting the possibility of a non-response bias, the average pre-test level of self-efficacy for gatekeepers in this study was 4 out of 5. This means that these gatekeepers began this study with a relative high level of self-efficacy in their suicide prevention skills. Given these initially high levels of self-efficacy, it is possible that null findings were found because a ceiling effect had been created.

Additionally, the power analysis suggested that 100 participants would be needed per condition assuming that the estimated treatment effect for self-efficacy (d = 0.75) was a correct estimate. Unfortunately, the average effect size found among this sample was much lower (d = 0.19). This suggests that an appropriate power of .80 for a two-tailed test was not achieved for this study. In addition, if these treatments produced such a small effect, more gatekeepers would need to have been recruited for this study to detect these small between-group treatment effects. Therefore, the findings of this study may more accurately reflect trends rather than conclusive results due to the risk of both type 1 and type 2 errors.

Another limitation of this study is a lack of pilot studies. For example, pilot studies were not conducted to test the discriminant validity of the self-efficacy scales, effect sizes of the treatment videos and the control webinar. A pilot study may have improved the internal validity of the scales developed for the study. For instance, the items could have been verified with an exploratory factor analysis followed by a confirmatory factor analysis. Such analyses can help researchers select items with the strongest factor loadings and helps ensure that each item is reliable within a scale. In regards to the three treatment groups, a more accurate estimate of the effect size could have been calculated if these videos were pilot-tested. This approach would have helped recruit an appropriate sample size for this study and potentially made these findings more applicable to all gatekeepers.

Another limitation of this study is that self-efficacy was never specified as either a state or a trait before scales were selected or developed. A state of self-efficacy would reflect a temporary feeling or perception of confidence toward suicide intervention; whereas, a trait would represent a more enduring perception of suicide prevention intervention ability. Some researchers (e.g., Gist et al., 1991; Schwoerer, May, Hollensbe, & Mencl, 2005) have

differentiated these two classifications as either general self-efficacy (e.g., trait) or specific self-efficacy (e.g., state). In addition, Maurer (2001) discussed how self-efficacy research needs further clarification in terms of the degree of specificity and operationalization of this construct. In examining the self-efficacy and SET scales, the items appear to have measured self-efficacy as a trait (refer to Appendix M).

In the context of this study, measuring self-efficacy to intervene as a trait rather than a state may have been problematic and negatively influenced the effects of the interventions. In fact, general self-efficacy has been posited to be more resistant to external influences (Judge, Thoresen, Pucik, & Welbourne, 1999) than specific self-efficacy. For example, perhaps a brief intervention may have not been sufficient to influence general self-efficacy. Additionally, Schwoerer and associates (2005) found that general self-efficacy was best explained by baseline levels of self-efficacy rather than the training they were testing. Given such findings, it seems logical to posit that results in this study may have differed if specific self-efficacy to intervene had been measured.

Next, another limitation in this study is that cross-sectional, self-report data was used to evaluate the effectiveness of two post-training interventions. Both the pre-test and post-test were measured at one time point. The cross-sectional approach does not take into account developmental changes. For example, it is possible that the interventions developed for this study may have influenced self-efficacy differently over time. Unfortunately, the long-term effects of these interventions is presently unknown.

Another potential limitation in this study is the method used to handle missing data. This study utilized the EM approach which can underestimate the standard error and produce biased results (Acock, 2005; Graham, 2003). In addition, when different algorithms (e.g., casewise

deletion, mean substitution) were examined with this dataset, the results of this study varied. However, as mentioned previously, multiple imputation may have been a better method for analyzing missing data in this study. For instance, Rubin (1987) recommends using multiple imputation to handle missing data. Contrary to a single imputation method in which missing data is simply replaced with one estimated value multiple imputation replaces each missing value with a predetermined number of plausible values while controlling for different sources of error. Thus, it seems possible that multiple imputation may have been a more accurate estimate of the missing values in this study.

The final major limitation of this study pertains to demand characteristics. Orne (1962) describes demand characteristics as an experimental artifact in which the participant is aware of the purpose of the experiment and changes their behavior to confirm the hypothesis. A number of researchers (e.g., Orne, 1962; Nichols & Maner, 2008; Sigall, Aronson, & van Hoose, 1970) have found evidence to support the occurrence of demand characteristics in research. However, Adair (1984) points out that although demand characteristics should be a concern for researchers, it is a poorly understood and measured construct. In addition, Nichols and Maner (2008) found support for the influence of demand characteristics, but this varied as a function of participants' attitudes toward the experiment or experimenter and individual differences as well. While Sigall and colleagues (1970) noted the difficulty in partialling out the potential effect of demand characteristics in experimental research, forty years later, little appears to have changed (Nichols & Maner, 2008). Therefore, although gatekeepers may have responded to this study in a hypothesis-confirming manner, the results from this study should not simply be dismissed. Moreover, the findings support the application of self-efficacy theory in the context of gatekeeper training.

Future Directions. The methodological limitations present in this study, along with mixed support for the proposed hypotheses demonstrate a need to further investigate the role that self-efficacy theory may play in sustaining the effects of gatekeeper training. While this study supports the utility of self-efficacy theory in predicting gatekeepers' self-efficacy, more research needs to be conducted in this area. Therefore, based on the results of this study, three future directions are proposed. First, the discriminant validity of the SET scales should be strengthened. Next, an effective post-training intervention needs to be assessed among this population. Lastly, the two interventions developed for this study should be tested on a non-gatekeeper population to examine whether these videos may influence self-efficacy outcomes.

Given the newness of this area of research, one in which self-efficacy scales were developed for the purpose of gatekeeper training, the SET scales should be strengthened in terms of scale reliability. As mentioned previously, the discriminant validity of the items, especially of the verbal persuasion items was called into question during this study. Future researchers should test the items created for this study, perhaps adding a few additional items, run an exploratory factor analysis, followed by a confirmatory factory analysis, and ensure that these scales represent four independent factors. In addition, the scales may be stronger if specific self-efficacy is measured rather than general self-efficacy. Creating more reliable and valid scales will only improve our knowledge regarding the factors that promote effective post-training interventions for gatekeeper training.

Another direction that future researchers may wish to explore is developing another intervention for gatekeepers to improve their self-efficacy. Perhaps a video format that integrates success stories may not be effective for this population. Another possibility for this group is to provide an effective refresher training that could help trainees feel more confident

and knowledgeable in their suicide prevention skills. It seems likely that gatekeepers would benefit from a refresher training that would help this population remember the material they learned and apply the skills they gained during their initial training.

Finally, these three post-training interventions should be tested on a non-gatekeeper populations. The rationale behind this direction is that if these interventions could boost confidence for suicide prevention gatekeepers who began with relatively high levels of confidence, it may be interesting to examine what effect these interventions may have on non-gatekeepers who may have lower levels of self-efficacy in their suicide prevention skills. Future researchers may wish to conduct this study with college students who tend to have higher response rates as a function of things like course credit. If these interventions prove to significantly increase individuals' confidence in their ability to prevent suicide, this in turn could have a positive effect on reducing suicide in our nation.

CONCLUSION

In conclusion, the results of this study are inconclusive. The post-training interventions trended toward increasing gatekeeper self-efficacy within groups, but between groups the interventions were found to be ineffective. Bandura's (1977; 1997) four sources of self-efficacy theory were found to positively and significantly contribute to our understanding of what factors may predict gatekeepers' self-efficacy after training. While this study possessed a number of limitations, it is one of the first to examine what strategies may improve gatekeeper training programs after initial training. Although the videos developed in this study proved to be ineffective with this gatekeeper population, it is possible that results may have varied if the sample had been different or if self-efficacy to intervene had been measured more as a state rather than a trait. What is clear from this study is that more work is needed to determine what type of post-training interventions will work to increase gatekeepers' self-efficacy.

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APPENDIX A

Applied Suicide Intervention Skills Training (ASIST)

This gatekeeper training program is part of a larger international suicide prevention initiative offered by LivingWorks that focuses on preventing suicide from a community perspective. According to Livingworks, this organization is, "…dedicated to enhancing suicide interventions skills at the community level, and committed to making its suicide prevention training programs widely available, cost effective, interactive and easy to learn, with practical applications designed for all types of caregivers." ASIST began in 1983 and has now become one of the most widely disseminated gatekeeper programs in the world. For instance, on average, 25,000 individuals attend ASIST training around the world annually. In addition, since 2006, the National Suicide Prevention Line (NSPL) network has adopted ASIST as their standard training practice for crisis line workers.

ASIST trainers are required to take a five-day workshop before they can train individuals in the community to be gatekeepers. To date, 2,500 locally-based instructors have been certified in this approach which follows a train-the-trainer model. Such instructors are given the skills to instill gatekeepers with the confidence and skills that they will need to apply suicide intervention first aid to individuals in crisis. The ASIST two-day training (i.e., 16 hours) provides trainees with first aid skills to directly intervene with a person in crisis.

The training itself addresses the following topics: (a) challenges and stigma surrounding suicide, (b) barriers between organizations and individuals in working with at-risk individuals, (c) development of appropriate communication and language, (d) community networking and knowledge of local resources, and (e) generalization of skills to other helping situations (e.g.,

homicide). Furthermore, this training provides extensive opportunities for role-playing. According to Livingworks 99% of trained gatekeepers would recommend this program to others.

Overall, LivingWorks states the following ten core beliefs about suicide prevention: (a) suicide is a community health problem, (b) thoughts of suicide are understandable, complex and personal, (c) suicide can be prevented, (d) help-seeking is encouraged by open, direct and honest talk about suicide, (e) relationships are the context of suicide intervention, (f) intervention should be the main prevention focus, (g) cooperation is the essence of intervention, (h) intervention skills are known and can be learned, (i) large numbers of people can be taught intervention skills, and (j) evidence of effectiveness should be broadly defined. To summarize, this organization seems to adopt a relatively optimistic approach toward the effectiveness of suicide prevention using ASIST. In fact, according to LivingWork's website, "Our beliefs sustain our hope that suicide-safer communities are possible." This gatekeeper approach has been empirically supported.

APPENDIX B

Question, Persuade, and Refer Training (QPR)

This gatekeeper approach serves as an emergency mental health intervention that is similar to CPR (Quinnett, 2007). This program is meant for lay people and professionals and teaches individuals to identify, question, and refer individuals to appropriate treatment. This gatekeeper program first became available in 1995 and development was led by Dr. Paul Quinnett. Thousands of individuals have been trained as certified QPR instructors in both America and abroad. These instructors receive 8 hours of training to become certified. Similar to ASIST, QPR adopts a community-based model to prevent and reduce suicide risk. According to the QPR institute, "…communities can come together to prevent not only self-destructive acts, but the other-directed violence that is too often associated with suicidal behavior."

The purpose of this training is to enable gatekeepers to get individuals in crisis to a professional for appropriate suicide risk assessment and treatment. The QPR institute emphasizes four core ideas that serve as the foundation for this gatekeeper program: (a) those who most need help in suicidal crisis are the least likely to ask for it, (b) the person most likely to prevent you from dying by suicide is someone you already know, (c) prior to making a suicide attempt, those in a suicidal crisis are likely to send warning signs of their distress and suicidal intent to those around them, and (d) when we solve the problems people kill themselves to solve, the reasons for suicide disappear. This program takes the perspective that suicide can be prevented with the proper implementation of evidence-based suicide prevention efforts.

The training lasts at least an hour, but may be extended to two hours with opportunities for role playing. The overarching purpose of QPR is to increase suicide awareness and give trainees basic skills to identify, refer, and direct individuals to appropriate treatment.

Gatekeepers are taught the following: (a) suicide warning signs, (b) how to offer hope to individuals at risk, (c) how to help those at risk, and (d) where to get help. QPR is taught in person and as a web-based interactive multimedia CD-ROM.

Studies conducted by the QPR institute suggest that preventing suicide is more cost-effective than hospitalizations of non-fatal suicidal behavior. In fact, this institute highlights a study conducted by the air force in which suicide prevention efforts were found to reduce suicide, homicide, and domestic violence rates in this population. Furthermore, Davis (2001) found that knowledge of suicide facts and suicide prevention attitudes were significantly maintained at 18 months. Unfortunately, evidence for the reduction of suicide rates, similar to other gatekeeper programs has not been well-supported with this suicide prevention approach.

APPENDIX C

Primary Invitation Letter

Dear [participant's first name],

The Colorado State Project Safety Net Team and the Office of Suicide Prevention at the Colorado Department of Public Health (CDPHE) cordially invites you to take part in a very important project to evaluate newly developed, web-based suicide prevention materials. These materials are designed to help gatekeepers maintain their suicide prevention efforts over time. Evaluation of their effectiveness is critically important, and we need your help to carry out this task.

We invite you to view and then evaluate a short internet presentation. As part of the evaluation, we will ask you to complete a short survey at three different times (before the presentation, immediately after the presentation, and 3-months after the presentation). Each survey will take less than five minutes for you to complete.

Your participation is voluntary and all of your responses will be kept confidential. If you feel that you are unable to or do not desire to participate, you may stop participating at any time. Although there are no direct benefits to you, participation in this study will help improve the training and strengthen suicide prevention efforts in the state of Colorado and nationwide.

If you wish to take part in this study, please remember to enter the following unique code: [participant's id] into your survey: http://psy.psych.colostate.edu/SafetyNet/

If you have questions regarding the survey, please feel free to contact Peter Chen, Project Director at Colorado State University (1-877-724-4111). If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator at Colorado State University (970-491-1655).

In advance, we thank you for taking the time to help your community.

Sincerely,

Peter Chen, Ph.D.
Professor and Project Director
Colorado State University

APPENDIX D

First Follow-up Email

Dear [participant's first name],

The Office of Suicide Prevention and Project Safety Net have recently invited you to participate in a very important study. The purpose of this study is to evaluate new materials that may help gatekeepers retain their knowledge, skills, and confidence after training.

Results from this study will help improve suicide prevention efforts in the state of Colorado and potentially nationwide.

Together we can make a difference.

Here is the link to assess the new materials: http://psy.psych.colostate.edu/SafetyNet/

Please remember to enter the following unique code, [participant's unique code], after you access the link. In advance, we thank you for taking the time to help your community.

If you have questions about the survey or the project, please contact the Project Safety Net team by email: psncdphe@lamar.colostate.edu or toll-free phone (1-877-724-4111).

Regards,

Colorado State Project Safety Net Team

APPENDIX E

Second Follow-up Email

Dear [participant's first name],

A week ago you received an email from the Colorado State Project Safety Net Team asking if you could take part in a very important study. The purpose of this study is to evaluate new materials that may help gatekeepers retain their knowledge, skills, and confidence after training.

Results from this study will help improve suicide prevention efforts in the state of Colorado and potentially nationwide.

Together we can make a difference.

Here is the link to assess the new materials: http://psy.psych.colostate.edu/SafetyNet/

Please remember to enter the following unique code, [participant's unique code], after you access the link. In advance, we thank you for taking the time to help your community.

If you have questions about the survey or the project, please contact the Project Safety Net team by email: psncdphe@lamar.colostate.edu or toll-free phone (1-877-724-4111).

Regards,

Colorado State Project Safety Net Team

APPENDIX F

Primary Recruitment Letter with Incentive Offer

Colorado State University

Dear [Participant's name],

You are being contacted because a few months ago you took part in a very important suicide prevention study. Thank you again for your participation! Your efforts provided valuable feedback regarding potential suicide prevention materials that we hope to disseminate to your community. Your input is making a difference!

Now, we would like to encourage you to participate in the last part of this study. Should you decide to participate, *we would be delighted to donate $3 on your behalf* to your local suicide prevention resource center.

This survey will take a few minutes to complete. Here is the link to the survey: http://psy.psych.colostate.edu/SafetyNet/

Please enter the following unique code, XXXXX, after you access the link.

If you have any questions about the survey or the project, please contact the Project Safety Net Team by email (psncdphe@lamar.colostate.edu) or toll-free number (1-877-724-4111).

Thank you in advance for your continued support!

Best Regards,

Colorado State Project Safety Net Team

APPENDIX G

First Follow-up Email with Incentive Offer

Dear [Participant's name],

You are being contacted because a few months ago you took part in a very important suicide prevention study. We are hoping to gain more feedback from you regarding the materials you previously evaluated. We understand that now may be a busy time for you.

Should you decide to participate in the study, *we will be delighted to donate $3 on your behalf* to your local suicide prevention resource center.

This survey will only take a few minutes to complete. Here is the link to the survey: http://psy.psych.colostate.edu/SafetyNet/

Please enter the following unique code, XXXXX, after you access the link.

If you have any questions about the survey or the project, please contact the Project Safety Net Team by email (psncdphe@lamar.colostate.edu) or toll-free number (1-877-724-4111).

Thank you in advance for your continued support!

Best Regards,

Colorado State Project Safety Net Team

APPENDIX H

Second Follow-up Email with Incentive Offer

Colorado State University

Dear [Participant's name],

You are being contacted because a few months ago you took part in a very important suicide prevention study. We understand that now may be a busy time for you. However, we hope you can find a few minutes to participate in the last part of this study.

Should you decide to participate *we would be delighted to donate $3 on your behalf* to your local suicide prevention resource center.

If you decided to participate, below is a link to the survey:
http://psy.psych.colostate.edu/SafetyNet/

Please enter the following unique code, XXXXX, after you access the link.

If you have any questions about the survey or the project, please contact the Project Safety Net Team by email (psncdphe@lamar.colostate.edu) or toll-free number (1-877-724-4111).

Thank you in advance for your continued support!

Best Regards,

Colorado State Project Safety Net Team

APPENDIX I

Pre-survey for 6-minute and 10-minute Treatment Videos

The Colorado State Project Safety Net team needs your help in evaluating a newly developed gatekeeper follow-up training program, which will take you less than 10 minutes to view. To evaluate the program, we ask you to respond to three brief surveys: immediately before and after the program, and also three months later. Each survey will take approximately 5-8 minutes to complete. Results from this study will help the state of Colorado and other states improve effects of gatekeeper trainings. Your participation is voluntary and all of your responses will be kept confidential.

Thank you again for your consistent participation and support!
The following few questions will help us know a little bit more about you and your suicide prevention experience. This information will be kept strictly confidential and will not be associated with you as an individual.

d1. How many hours would you say you have devoted to participating in suicide prevention training and workshops in the last six months? (please check appropriate box)

___0 hours
___1-2 hours
___3-8 hours
___9-16 hours
___17-20 hours
___More than 20 hours

d2. What is your age? (please enter your age into the box) ____

d3. What is your gender? (please check appropriate box)

Male___ Female___ Other___

Below is a list of statements of what you may **believe about suicide prevention**. Please read each statement and use the rating scale below to indicate the degree to which you agree or disagree with it. There are no right or wrong answers. It is important that you answer all statements according to your beliefs and not what you think others may want you to believe.

Please select the box that best describes your response	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I feel confident in my ability to help a suicidal person	SD	D	N	A	SA

2. I don't think I can prevent someone from suicide	SD	D	N	A	SA
3. I don't feel competent to help a suicidal person	SD	D	N	A	SA
4. Just thinking about intervening with a suicidal person makes me feel stressed	SD	D	N	A	SA
5. My mind goes blank when I think about intervening with a person at risk for suicide	SD	D	N	A	SA
6. I feel anxious as soon as I think about intervening with someone at risk for suicide	SD	D	N	A	SA
7. The thought of asking someone if they want to kill themselves freaks me out	SD	D	N	A	SA
8. I get overwhelmed by the thought of intervening with a person in crisis	SD	D	N	A	SA
9. My whole body becomes tense when I think about intervening with someone in a suicidal crisis	SD	D	N	A	SA

In this section, we would like to know about your experiences directing suicidal individuals to resources, making referrals, and helping someone suffering from major depression.

10. Have you directly intervened with a person who showed signs of being suicidal or seriously depressed in the last six months?
    • Yes • No

Please answer the remaining questions only if you selected "Yes" above.

11. How many people, who showed signs of being suicidal or seriously depressed, did you directly intervene with in the last six months? (please enter actual number, e.g., 0, 1, 2)____

In how many of these instances did you … (please enter actual number, e.g., 0, 1, 2):

12. . … ask them directly if they were thinking about harming themselves or attempting suicide? _____
13. . … encourage them to talk about their reasons for dying? _____
14. . … encourage them to talk about their reasons for living? _____
15. . … ask them questions to find out about their suicide plan? _____
16. . … ask them questions to find out if they felt alone? _____
17. ….. ask them what resources were (un)available to them (e.g., family and friends)? _____

18. . … ask them if they had attempted suicide before? _____

19. . … contract a safeplan with them? _____

20. . … refer them to get further help? _____

21. . … follow-up with them later? _____

How do you feel about your previous experiences in intervening with a suicidal or seriously depressed individual?	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
22. I have successfully helped individuals at risk for suicide	SD	D	N	A	SA
23. I have been effective in directing at-risk individuals to resources	SD	D	N	A	SA
24. I have made successful referrals for individuals at risk for suicide	SD	D	N	A	SA

You are about to view a short presentation intended to improve gatekeeper training programs. Please make sure that you are in a quiet environment to view it without being interrupted. After you view the materials, you will be asked some questions pertaining to the presentation. Thank you.

TREATMENT VIDEO (e.g., 6-minute or 10-minute)

APPENDIX J

Post-survey for 6-minute and 10-minute Treatment Videos

Thank you for taking the time to watch the presentation!

Now, please take a moment to read each statement below pertaining to the presentation you just watched and use the rating scale to indicate the degree to which you agree or disagree with it. There are no right or wrong answers. Some items may seem similar to questions you were previously asked. Please answer these questions based on how you feel at this moment.

Please select the box that best describes your response	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
25. I feel confident in my ability to help a suicidal person	SD	D	N	A	SA
26. I don't think I can prevent someone from suicide	SD	D	N	A	SA
27. I don’t feel competent to help a suicidal person	SD	D	N	A	SA
28. Just thinking about intervening with a suicidal person makes me feel stressed	SD	D	N	A	SA
29. My mind goes blank when I think about intervening with a person at risk for suicide	SD	D	N	A	SA
30. I feel anxious as soon as I think about intervening with someone at risk for suicide	SD	D	N	A	SA
31. The thought of asking someone if they want to kill themselves freaks me out	SD	D	N	A	SA
32. I get overwhelmed by the thought of intervening with a person in crisis	SD	D	N	A	SA
33. My whole body becomes tense when I think about intervening with someone in a suicidal crisis	SD	D	N	A	SA
34. The presentation persuaded me that I am capable of intervening with at-risk individuals	SD	D	N	A	SA
35. The presentation convinced me that I have the power to help someone in a suicidal crisis	SD	D	N	A	SA
36. The presentation convinced me that I can help suicidal individuals, just like other gatekeepers	SD	D	N	A	SA

37. Watching how others in the video have successfully helped a suicidal person makes me feel like I can do it	SD	D	N	A	SA
38. Observing how others in the video have successfully intervened with a person in crisis helped me picture myself doing the same	SD	D	N	A	SA
39. Learning of other gatekeepers' positive experiences during the video helped me imagine successfully intervening with a suicidal person	SD	D	N	A	SA

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX K

Pre-survey for Control Group Webinar

The Colorado State Project Safety Net team needs your help in evaluating a newly developed gatekeeper follow-up training program, which will take you less than 10 minutes to view. To evaluate the program, we ask you to respond to three brief surveys: immediately before and after the program, and also three months later. Each survey will take approximately 5-8 minutes to complete. Results from this study will help the state of Colorado and other states improve effects of gatekeeper trainings. Your participation is voluntary and all of your responses will be kept confidential.

Thank you again for your consistent participation and support!

The following few questions will help us know a little bit more about you and your suicide prevention experience. This information will be kept strictly confidential and will not be associated with you as an individual.

d1. How many hours would you say you have devoted to participating in suicide prevention training and workshops in the last six months? (please check appropriate box)

___0 hours
___1-2 hours
___3-8 hours
___9-16 hours
___17-20 hours
___More than 20 hours

d2. What is your age? (please enter your age into the box) ____

d3. What is your gender? (please check appropriate box)

Male___ Female___ Other___

Below is a list of statements of what you may **believe about suicide prevention**. Please read each statement and use the rating scale below to indicate the degree to which you agree or disagree with it. There are no right or wrong answers. It is important that you answer all statements according to your beliefs and not what you think others may want you to believe.

Please select the box that best describes your response	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I feel confident in my ability to help a suicidal person	SD	D	N	A	SA

2. I don't think I can prevent someone from suicide	SD	D	N	A	SA
3. I don't feel competent to help a suicidal person	SD	D	N	A	SA
4. Just thinking about intervening with a suicidal person makes me feel stressed	SD	D	N	A	SA
5. My mind goes blank when I think about intervening with a person at risk for suicide	SD	D	N	A	SA
6. I feel anxious as soon as I think about intervening with someone at risk for suicide	SD	D	N	A	SA
7. The thought of asking someone if they want to kill themselves freaks me out	SD	D	N	A	SA
8. I get overwhelmed by the thought of intervening with a person in crisis	SD	D	N	A	SA
9. My whole body becomes tense when I think about intervening with someone in a suicidal crisis	SD	D	N	A	SA

In this section, we would like to know about your experiences directing suicidal individuals to resources, making referrals, and helping someone suffering from major depression.

10. Have you directly intervened with a person who showed signs of being suicidal or seriously depressed in the last six months?

    • Yes • No

Please answer the remaining questions only if you selected "Yes" above.

11. How many people, who showed signs of being suicidal or seriously depressed, did you directly intervene with in the last six months? (please enter actual number, e.g., 0, 1, 2)____

In how many of these instances did you … (please enter actual number, e.g., 0, 1, 2):

12. . … ask them directly if they were thinking about harming themselves or attempting suicide? _____

13. . … encourage them to talk about their reasons for dying? _____

14. . … encourage them to talk about their reasons for living? _____

15. . … ask them questions to find out about their suicide plan? _____

16. . … ask them questions to find out if they felt alone? _____

17. ….. ask them what resources were (un)available to them (e.g., family and friends)? _____

18. . … ask them if they had attempted suicide before? _____

19. . … contract a safeplan with them? _____

20. . … refer them to get further help? _____

21. . … follow-up with them later? _____

How do you feel about your previous experiences in intervening with a suicidal or seriously depressed individual?	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
22. I have successfully helped individuals at risk for suicide	SD	D	N	A	SA
23. I have been effective in directing at-risk individuals to resources	SD	D	N	A	SA
24. I have made successful referrals for individuals at risk for suicide	SD	D	N	A	SA

You are about to view a short presentation intended to improve gatekeeper training programs. Please make sure that you are in a quiet environment to view it without being interrupted. After you view the materials, you will be asked some questions pertaining to the presentation. Thank you.

CONTROL WEBINAR

APPENDIX L

Post-survey for Control Group Webinar

Thank you for taking the time to watch the presentation!

Now, please take a moment to read each statement below pertaining to the presentation you just watched and use the rating scale to indicate the degree to which you agree or disagree with it. There are no right or wrong answers. Some items may seem similar to questions you were previously asked. Please answer these questions based on how you feel at this moment.

Please select the box that best describes your response	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
25. I feel confident in my ability to help a suicidal person	SD	D	N	A	SA
26. I don't think I can prevent someone from suicide	SD	D	N	A	SA
27. I don’t feel competent to help a suicidal person	SD	D	N	A	SA
28. Just thinking about intervening with a suicidal person makes me feel stressed	SD	D	N	A	SA
29. My mind goes blank when I think about intervening with a person at risk for suicide	SD	D	N	A	SA
30. I feel anxious as soon as I think about intervening with someone at risk for suicide	SD	D	N	A	SA
31. The thought of asking someone if they want to kill themselves freaks me out	SD	D	N	A	SA
32. I get overwhelmed by the thought of intervening with a person in crisis	SD	D	N	A	SA
33. My whole body becomes tense when I think about intervening with someone in a suicidal crisis	SD	D	N	A	SA
34. The presentation persuaded me that I am capable of intervening with at-risk individuals	SD	D	N	A	SA
35. The presentation convinced me that I have the power to help someone in a suicidal crisis	SD	D	N	A	SA

36. The presentation convinced me that I can help suicidal individuals, just like other gatekeepers	SD	D	N	A	SA

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX M

Survey Items

Demographics

1. How many hours would you say you have devoted to participating in suicide prevention training and workshops in the last six months? (please check appropriate box)
    a. ___0 hours
    b. ___1-2 hours
    c. ___3-8 hours
    d. ___9-16 hours
    e. ___17-20 hours
    f. ___More than 20 hours

2. What is your age? (please enter your age into the box) ____

3. What is your gender? (please check appropriate box)
    i. Male___ Female___ Other___

4. EXCLUDING the suicide prevention presentation we showed you three months ago, how many hours would you say you have participated in suicide prevention training and workshops in the last three months? (please check appropriate box)
    a. ___0 hours
    b. ___1-2 hours
    c. ___3-8 hours
    d. ___9-16 hours
    e. ___17-20 hours
    f. ___More than 20 hours

Past Behavior

1. Have you directly intervened with a person who showed signs of being suicidal or seriously depressed in the last three months?
    • Yes • No
2. How many people, who showed signs of being suicidal or seriously depressed, did you directly intervene with in the last three months? (please enter actual number, e.g., 0, 1, 2) ____
3. In how many of these instances did you … (please enter actual number, e.g., 0, 1, 2):
4. . … ask them directly if they were thinking about harming themselves or attempting suicide? _____
5. . … encourage them to talk about their reasons for dying? _____
6. . … encourage them to talk about their reasons for living? _____
7. . … ask them questions to find out about their suicide plan? _____
8. . … ask them questions to find out if they felt alone? _____
9. ….. ask them what resources were (un)available to them (e.g., family and friends)? _____

10. . … ask them if they had attempted suicide before? _____
11. . … contract a safeplan with them? _____
12. . … refer them to get further help? _____
13. . … follow-up with them later? _____

Self-Efficacy to Intervene

1. I feel confident in my ability to help a suicidal person
2. I don't think I can prevent someone from suicide (reverse-coded)
3. I don't feel competent to help a suicidal person (reverse-coded)

Mastery Experience

1. I have successfully helped individuals at risk for suicide
2. I have been effective in directing at-risk individuals to resources
3. I have made successful referrals for individuals at risk for suicide

Verbal Persuasion

1. The presentation persuaded me that I am capable of intervening with at-risk individuals
2. The presentation convinced me that I have the power to help someone in a suicidal crisis
3. The presentation convinced me that I can help suicidal individuals, just like other gatekeepers

Vicarious Experience

1. Watching how others in the video have successfully helped a suicidal person makes me feel like I can do it
2. Observing how others in the video have successfully intervened with a person in crisis helped me picture myself doing the same
3. Learning of other gatekeepers' positive experiences during the video helped me imagine successfully intervening with a suicidal person

Physiological and Affective States

1. Just thinking about intervening with a suicidal person makes me feel stressed
2. My mind goes blank when I think about intervening with a person at risk for suicide
3. I feel anxious as soon as I think about intervening with someone at risk for suicide
4. The thought of asking someone if they want to kill themselves freaks me out
5. I get overwhelmed by the thought of intervening with a person in crisis
6. My whole body becomes tense when I think about intervening with someone in a suicidal crisis