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Gatekeeper Training for Suicide Prevention

A Theoretical Model and Review of the Empirical Literature

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Preface

The Department of Defense (DoD) has been actively engaged in preventing suicides among service members for some time. In its 2011 report *The War Within* (Ramchand et al., 2011), on preventing suicide among military personnel, the RAND National Defense Research Institute made 14 recommendations for DoD to consider in its ongoing suicide prevention efforts. Among these was Recommendation 5: "Evaluate Gatekeeper Training." Prior research highlighted that the majority of suicide prevention activities in DoD rely on gatekeeper models, in which all military personnel, but particularly noncommissioned officers and chaplains, are trained to identify, intervene, and refer people at risk. Given the reliance on these programs in the military to prevent suicides, and in the spirit of Recommendation 5, this study reviews the literature to better understand what is known about gatekeeper training models.

The research presented here was sponsored by the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury and conducted within the Forces and Resources Policy Center of the RAND National Defense Research Institute (NDRI). NDRI is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the Unified Combatant Commands, the Navy, the Marine Corps, the defense agencies, and the defense Intelligence Community. For more information on the Forces and Resources Policy Center, see http://www.rand.org/nsrd/ndri/centers/frp.html or contact the director (contact information is provided on the web page).

Contents

Figure and Tables

Figure

Tables

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Gatekeeper Training for Suicide Prevention: A Theoretical Model and Review of the Empirical Literature

Background

The rate of military suicides has been increasing in recent years. In 2010—the most recent year for which we have epidemiologic data—there were 301 suicide deaths among service members on active duty, equating to a rate of 18.0 suicides per 100,000 service members (Luxton et al., 2012). The increase in suicide within the Department of Defense (DoD), and more specifically among the Army and Marine Corps, has generated concern among policymakers, military leaders, and the public at large. This concern is evidenced by the creation in 2010 of a congressionally directed task force (Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Foces, 2010), a new DoD office (the Department of Defense Suicide Prevention Office) focused specifically on suicide prevention, the Army's allocation of $50 million to study suicide within its ranks ("NIMH, U.S. Army Sign MOA to Conduct Groundbreaking Suicide Research," 2008), and increased media scrutiny (Edwards-Stewart et al., 2011).

Each service has implemented policies and programs focused on preventing suicide within the ranks. These suicide prevention programs rely heavily on trainings for service members and their leadership that aim to train service members on how to identify individuals who may be at risk of suicide, provide immediate support, and refer them to an appropriate individual who is able to offer help. In both the Army and Marine Corps, the service members responsible for identifying and referring at-risk individuals ("gatekeepers") are typically noncommissioned officers (NCOs) and members of the chaplaincy (including chaplains and chaplain assistants in the Army and chaplains and religious program specialists in the Navy that serve marines) (Ramchand et al., 2011).

The Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury funded the RAND Corporation, a private, nonprofit research and development organization, to conduct a research study to better understand the role and experiences of front-line military leaders and members of the chaplaincy in preventing suicide. In this report, we review the existing literature on what is known about the effectiveness of gatekeepers and of gatekeeper training. We present a theoretical model describing how gatekeeper training may influence individual characteristics that may, in turn, result in intervention behaviors. We then review the evidence supporting each of the relationships presented in this model, and conclude with recommendations for advancing research in this field.

Defining *Gatekeepers* and *Gatekeeping*

In the field of suicide prevention, the term *gatekeeper* refers to "individuals in a community who have face-to-face contact with large numbers of community members as part of their usual routine." They may be trained to "identify persons at risk of suicide and refer them to treatment or supporting services as appropriate" (U.S. Department of Health and Human Services Office of the Surgeon General and National Action Alliance for Suicide Prevention, 2012). In this context, *gatekeeping* simply refers to performing the trained responsibilities of a gatekeeper. The military and civilian literature defines the notion of a gatekeeper similarly, although the persons designated as potential gatekeepers across populations vary. For example, gatekeeper programs in schools have focused on training teachers and school staff, but some have also trained students to act as gatekeepers to their peers (e.g., Aseltine and DeMartino, 2004; Wyman et al., 2008). In medical settings, primary care and emergency department staff have been trained to be gatekeepers (e.g., Matthieu et al., 2008; Tsai et al., 2011).

Theoretical Approach to Understand Gatekeeping

To develop a conceptual model of gatekeeping, we drew on existing research evidence. We used two database search strategies to identify relevant literature. First, we searched the National Registry of Evidence-Based Programs and Practices (NREPP) to identify those evaluation studies used to verify suicide prevention programs as evidence-based ("SAMHSA's National Registry of Evidence-Based Programs and Practices," 2012). Second, we conducted a comprehensive literature search in databases covering health (psychology and medicine), the social sciences, and defense: PsycINFO (psychology), PubMed (medicine), New York Academy of Medicine Grey Literature Collection (medicine), Social Science Abstracts (social sciences), and Defense Technical Information Center (defense).[1] Fifty-three articles were identified that met criteria for inclusion in our literature review—i.e., that they be written in English; were published in peer-reviewed journals; and were empirical papers (including studies, reviews, or meta-analyses) of gatekeeping behavior to reduce or prevent suicide, which may include studies of crisis hotlines, health care providers, or suicide "postvention" efforts that also train individuals to serve as gatekeepers.[2] Relevant information on the domains presented in Table 1 was systematically abstracted for each study. A condensed table describing key constructs of each study is presented in the Appendix.

[1] This literature search was conducted as part of a corresponding product that evaluated suicide prevention programs (Acosta et al., 2013). Each study labeled as a gatekeeper suicide prevention program was included in the current study. In addition, novel searches were conducted to identify studies of gatekeeping behavior that were not necessarily program evaluations. Four separate search strategies were conducted in PsycINFO and PubMed: (1) (SU=suicide) AND (SU=prevention OR awareness OR intervention) AND (SU=gatekeeper OR training), (2) (SU=suicide AND prevention AND gatekeeper); (3) (SU=suicide AND prevention AND gatekeeper AND training); and (4) (SU=suicide) AND (SU=prevention) AND (SU=gatekeeper). These novel searches yielded two additional papers not identified by Acosta et al. (2013).

[2] Articles were excluded that (a) discussed suicide prevention programs that do not include gatekeeper training (e.g., marketing campaigns, mental health interventions, screening with standardized instruments, restricted access to lethal means, and coping skills/self-referral training); (b) focused on the epidemiology of suicide; (c) were published in a language other than English; or (d) were editorials, letters, commentaries, or case studies.

Table 1
Abstracted Information from Gatekeeping Literature Review

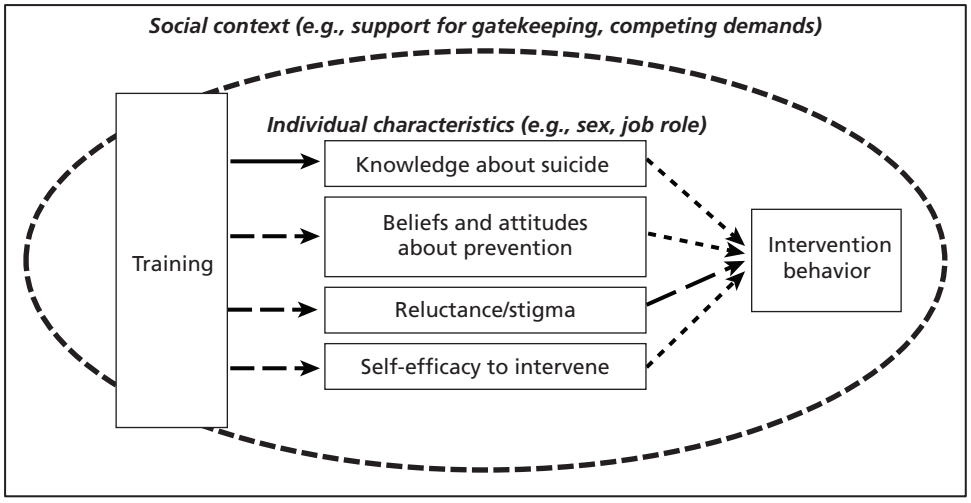
Program Description	Evaluation Design	Constructs and Measures
• Program name • Type of program (crisis hotline, gatekeeper training, screening program, provider training, treatment intervention, social/policy interventions, systems approaches) • Population • Hours or elements of training	• Brief description of evaluation design • Time points for data collection • Sample size • Experimental (control group, comparison group) • Analytic strategy • Brief description of evaluation findings	• Gatekeeper self-efficacy, attitudes, past experiences, constructs (and measures), etc. • Dependent variables other than pre/post changes in knowledge, attitudes, etc. (and measures). This includes intentions to intervene and intervention/referral behavior. • Measurement of suicide attempts or completions
Aspects Relevant to Model	**Relevant Hypotheses**	**Other**
• Training focus areas examined (education about suicide/mental health, knowledge of risk factors, risk assessment, communication skills, information about resources, referral process/skills) • Gatekeeper characteristics examined in analyses (age, sex, job type, previous experience, education/degree) • Other barriers/facilitators examined (beliefs or attitudes about suicide/mental health, motivation, reluctance, comfort, self-efficacy, training quality, social and organizational support, competing job demands)	• Tested main effects of hours spent training a specific aspect (e.g., risk assessment) on intentions to intervene or intervention behavior • Tested main effects of demographics/beliefs/self-efficacy on intentions to intervene or intervention behavior • Tested interactions between elements of training and self-efficacy/demographics/past experience variables • Tested any other interactions	• Results relevant to factors that facilitate or hinder gatekeeper behaviors • Questions/issues/use for the current study

Guided by this literature, RAND developed a conceptual model of gatekeeping that describes the pathways between training and intervention behaviors. The model also accounts for factors that may hinder or enhance the effectiveness of such trainings or of intervention behaviors. The model is consistent with Bandura's social cognitive theory, which posits that interactions between environmental and personal factors influence the learning of new behavior (Bandura, 2001). The model is depicted in Figure 1.

In the model, "training" is a generic concept that encompasses training on suicide prevention broadly or on specific gatekeeper skills. While not every gatekeeper must be specifically trained in how to intervene and care for persons at potential risk of suicide, most of the literature to date stems from evaluations of training programs. Furthermore, the Marine Corps and Army both provide gatekeeper training to NCOs as a key component of their service-wide approach to suicide prevention, and thus including that factor in the model is particularly relevant. The box on the far right, "intervention behavior," is considered to be the main mechanism to reduce the ultimate outcome, rates of suicide completions and attempts. It refers to any action that involves asking another individual about mental health issues, suicidal thoughts or plans, and/or escorting or encouraging those at risk to seek help.

As the model shows, there are four factors that may influence an individual's decision to intervene with a person at risk of suicide and that can be affected by effective gatekeeper training:

Figure 1
Existing Evidence for Factors That Affect Intervention Behavior



SOURCE: Based on Bandura, 2001.
NOTE: The weights of the arrows signify the strength of the research evidence. The solid arrows indicate that substantial evidence exists for the relationship, dashed arrows represent some or mixed evidence, and dotted arrows indicate that these relationships have not been studied in the existing literature.
RAND *RR1002-1*

1. **Knowledge about suicide**, which includes declarative and perceived knowledge about suicide, depression, and resources available for at-risk individuals.
2. **Beliefs and attitudes about suicide prevention** refers to whether individuals believe suicide is considered preventable, whether it is important or appropriate to intervene with at-risk individuals, and whether seeking help for mental illness is a form of self-care.
3. **Reluctance to intervene** refers to perceptions individuals may have that it is not their responsibility or that it is inappropriate to intervene; **stigma** of mental illness is one reason for gatekeeper reluctance.
4. **Self-efficacy to intervene** reflects the extent to which the individual feels comfortable and competent to identify, care for, and facilitate referral for a person at risk of suicide.

By placing the model within a circle representing the individual, we purport that each factor's influential strength on intervention behavior may differ from person to person. In addition, there may be systematic differences across individuals on how training influences these factors, as well as how changes in these factors may influence intervention behavior. Such **individual characteristics** are personal attributes that include demographic information (e.g., sex, age, race) and professional background (e.g., job type, education, prior suicide prevention training). The circle containing these individual characteristics is dashed and within a square that represents the **social context** in which a person acts or is expected to act as a gatekeeper. Systemic factors at this level influence gatekeeping constructs in the same way as individual characteristics, and may describe the extent to which one's organization, supervisor, or coworkers support the role of gatekeepers to prevent suicide or impose competing demands that limit the ability of persons to act as gatekeepers. Because both organizational and individual factors

may influence the amount and type of gatekeeper training a person receives, the box depicting training purposely spans both the individual and social contexts.

In what follows, we present an overview of the scientific literature on each of these factors. For each factor (knowledge, beliefs, reluctance, and self-efficacy), we describe (1) the evidence on how training impacts the factor, (2) how changes or differences in the factor itself are related to intervention behavior, and (3) whether changes in this factor are related to changes in suicides or suicide attempts. Then, we examine the literature describing how individual and systemic characteristics are associated with each of the four factors, as well as how they may modify the effect of training on the factor. As we indicate, the evidence is well developed in some areas, while in others there are significant gaps.

Limitations of the Existing Literature

Before reviewing the evidence, it is important to note study limitations that effect the conclusions we can draw from the studies as a whole. First, in terms of design, most of the studies in the existing literature are either single-group (n = 24) or had a non-equivalent control group (i.e., quasi-experimental design, n = 21); only eight of the 53 studies in this review used an experimental design. Thus, the causal relationship between training and each factor and ultimately on behavior is difficult to discern. Second, most of the existing evidence comes from pre- and post-training comparisons of gatekeeper behavior. Forty-four studies in this review had at least two measurement occasions, and nine studies were cross-sectional. Only a few studies included an additional measurement occasion six months or one year after training to examine more long-term effects of training. Thus, we are limited in our ability to discern whether the effects of training persist or, alternatively, whether effects emerge over time. Third, the existing literature does not contain many studies of gatekeeper training programs specifically with military personnel. Our search identified only four studies in the military context. The efficacy of gatekeeper programs in the military is not well established, and there was minimal existing literature to inform this review. The existing literature regarding gatekeeper programs for suicide prevention has almost exclusively been in educational (high school or college), community, or workplace settings. Finally, the specific methods and content of gatekeeper training can vary extensively from one training program to the next. As the programs are quite heterogeneous, it is challenging to draw strong conclusions regarding exactly how gatekeeper training affects intervention behavior.

1. Knowledge About Suicide

Knowledge about suicide includes declarative and perceived knowledge about suicide, depression, and resources available for at-risk individuals. *Declarative knowledge* is the ability of individuals to accurately recall relevant information (e.g., risk factors for suicide). *Perceived knowledge* is the extent to which individuals believe they know about a particular area (e.g., "do you know how to ask someone if they are considering suicide?"). Knowledge about suicide is expected to impact gatekeeping behavior by either enabling potential gatekeepers to identify those at risk of suicide and/or enabling potential gatekeepers to assist at-risk individuals in seeking help.

Does training affect knowledge? There is substantial evidence that training can increase both declarative and perceived knowledge about suicide (Abbey, Madsen, and Polland, 1989;

Aseltine and DeMartino, 2004; Bean and Baber, 2011; Cross et al., 2007; Cross et al., 2011; Gordana and Milivoje, 2007; Matthieu et al., 2008; Shim and Compton, 2010; Tompkins, Witt, and Abraibesh, 2010; Tsai et al., 2011; Wyman et al., 2008). Those who receive gatekeeper training are generally better able to recognize warning signs of suicide and choose effective intervention strategies compared with those who have not received training. For example, Aseltine and DeMartino (2004) examined high school students who were randomly assigned to either participate in Signs of Suicide (SOS), a two-day training that teaches students to recognize the signs of suicide in themselves and others, or to a control group. SOS is a school-based gatekeeper training for students that incorporates suicide awareness with a brief screening for depression and other risk factors associated with suicidal behavior. The didactic component of the program is based on the action steps "acknowledge, care, and tell" (ACT), through which youths are taught to *acknowledge* the signs of suicide that others display and take them seriously, demonstrate *care* for the at-risk individual, and *tell* a responsible adult. Three months after the intervention, students who received training had significantly higher declarative knowledge about depression and suicide than those in the control group.

Further, interactive training methods may improve knowledge gains from training compared with self-study methods from educational pamphlets. Abbey, Madsen, and Polland (1989) found that participants who received lectures plus educational handouts had significantly higher post-training knowledge scores than the randomly assigned handouts-only group or the control group. Another study, by Cross and colleagues (2007), found that QPR (Question, Persuade, and Refer) training plus a standardized role-play exercise helped participants practice gatekeeping skills such as the ability to ask directly about suicide, persuade the at-risk individual to accept help, and refer appropriately both after the training and six weeks later. Participants who took part in the role-play exercise felt it was a worthwhile experience and that it enhanced their training of gatekeeper knowledge and skills, though the lack of a control group in this study weakens the conclusions we can make about the effects of the treatment.

It is important to note that while most studies show evidence that training increases knowledge, at least one study found no such effect. Specifically, Mishara, Houle, and Lavoie (2005) found that training did not significantly improve knowledge about suicide or the utilization of resources for gatekeepers or the suicidal individual six months after the training. Thus, gatekeepers were not effectively encouraging those who were at risk of suicide to utilize resources. Also important is that individual characteristics, such as sex, job type, and educational background, have been found to moderate knowledge acquisition from training (see the *Differences in Individual Characteristics* section later in this report).

Does knowledge impact intervention behavior? While there is substantial evidence that suicide prevention training positively impacts participants' knowledge about suicide, the relationship between knowledge about suicide and actual intervention behavior (i.e., gatekeeping) remains unexamined.

Does greater knowledge result in fewer suicides or suicide attempts? There is limited evidence that gains in knowledge about suicide are related to fewer suicides and/or suicide attempts. One experimental study found that high school student gatekeepers who received training had more knowledge about suicide and fewer suicide attempts after training compared with the control group (Aseltine and DeMartino, 2004). The study concluded that greater knowledge of depression and suicide was significantly associated with a lower probability of self-reported suicide attempts in the three months following program implementation, though

it is not clear that gatekeeper training or associated behaviors, per se, were the reason that suicide attempts decreased.

A study by Gordana and Milivoje (2007) evaluated a gatekeeper training program in the army of Serbia and Montenegro that was implemented in 2003. The authors tracked suicide rates, as well as knowledge and attitudes about depression and suicide, yearly from 1999 to 2005 (before and after program implementation). The program, based on the U.S. Air Force strategy (Knox et al., 2003), consisted of four levels of gatekeeping, starting with soldiers themselves being trained to recognize the signs of suicide, and followed by three layers of mental health service providers: the primary mental health team in a military unit (physicians, psychologists, and officers); the secondary mental health team, situated in the Military Medical Center (psychiatrists and psychologists); and the tertiary mental health team, situated in the Military Medical Academy (psychiatrists and psychologists who refer soldiers to treatment). After the implementation of the suicide prevention program in 2003, knowledge about suicide had improved and deaths by suicide had decreased among army personnel (Gordana and Milivoje, 2007). This study is particularly noteworthy because it was one of very few studies identified in our literature search that focused on a suicide prevention program implemented in a military context. However, interpretation of the results must be made cautiously: As opposed to the experimental high school study by Aseltine and DeMartino (2004), the findings of the Serbian and Montenegrin army evaluation are based on an observational study, meaning that findings are correlational and it is impossible to determine whether the program *caused* the increase in knowledge or reduction in suicide attempts.

2. Beliefs and Attitudes About Suicide Prevention

Beliefs and attitudes about suicide prevention cover a broad spectrum, but mostly tend to focus on whether suicide is considered preventable, whether it is important or appropriate to intervene with at-risk individuals, and whether seeking help for mental illness is a viewed as a form of self-care.

Does training affect beliefs and attitudes about suicide prevention? There is limited evidence that training helps develop more adaptive, or desirable, beliefs and attitudes about suicide prevention. Three studies among high school and university students found that individuals who received training had more adaptive attitudes post-training (Aseltine and DeMartino, 2004; Aseltine et al., 2007; Indelicato, Mirsu-Paun, and Griffin, 2011). For example, an evaluation of implementing the QPR gatekeeper training among university staff and students found significant self-reported increases from pre- to post-training in participants' belief that it is appropriate to ask someone about suicide, and in the likelihood they would do so (Indelicato, Mirsu-Paun, and Griffin, 2011). Furthermore, the effects of training did not deteriorate from one to three months post-training, indicating some lasting changes in beliefs about suicide prevention, though this study has no control group for comparison.

In a study that administered a gatekeeper training program to students at three schools and withheld training at two schools, students who received training did not display more adaptive attitudes about prevention than the students at schools where the training was withheld (Spirito et al., 1988). Students who participated in the program showed slight but not statistically significant improvements in their attitudes about the efficacy of mental health treatment or whether suicidal ideation should be kept to oneself. It is important to note that the suicide prevention program did not negatively affect attitudes toward suicide, which is one of the primary concerns of opponents of suicide education in schools (Spirito et al., 1988).

Do beliefs and attitudes about suicide prevention impact intervention behavior? Although there is some evidence that gatekeeper training positively impacts participants' beliefs about suicide prevention, the relationship between attitudes about suicide prevention and gatekeeping behavior remains unexamined.

Do more adaptive beliefs and attitudes result in fewer suicides or suicide attempts? As with knowledge about suicide, there is limited evidence that development of more adaptive beliefs about suicide prevention are related to fewer suicides and suicide attempts. Again, Aseltine and DeMartino (2004) found that more adaptive attitudes about suicide and intervention were significantly associated with a lower probability of self-reported suicide attempts in the three months following program implementation. Furthermore, more adaptive attitudes toward suicide partially mediated the effect on treatment group (training versus control) on suicide attempts in the three-month period following training. That is, the effects of training on suicide attempts were partially explained by gains in attitudes youth had about suicide prevention (Aseltine and DeMartino, 2004), though again, this universal training encompassed more than just training on gatekeeping strategies.

In addition, Gordana and Milivoje (2007) found that after implementing a suicide prevention program in the army of Serbia and Montenegro in 2003, attitudes toward suicide prevention had improved and deaths by suicide had decreased among army personnel. Again, these findings were correlational, and it is impossible to determine whether the program *caused* the improved attitudes or reduction in suicide attempts.

3. Reluctance to Intervene and Stigma

Potential gatekeepers may be reluctant or unlikely to intervene with an at-risk individual because they feel that it is not their responsibility or that it is inappropriate to intervene. The stigma of mental illness is one reason for gatekeeper reluctance. Here, *stigma* refers to negative stereotypes and discriminatory behavior against someone who has or is thought to have a mental illness (Corrigan, 2004). The most common type of discriminatory action is socially avoiding a person who is thought to have a mental illness (Corrigan, 2004). Potential gatekeepers may not feel comfortable interacting with individuals in distress or at risk of suicide, and may avoid them as a result. Further, potential gatekeepers may avoid the topic of depression and suicide in conversation to avoid attributing the label of mental illness to another individual, which they fear could cause further distress (Mishara, Houle, and Lavoie, 2005).

Does training affect reluctance to intervene? Three studies of gatekeeper training programs found that training reduced reluctance to intervene when compared with a control group (Bean and Baber, 2011; Tompkins and Witt, 2009; Wyman et al., 2008). Tompkins and Witt (2009) evaluated the impact of the QPR gatekeeper training on college resident advisors.[3] Advisors who received the QPR training showed reductions in reluctance after the training was complete, and these reductions were maintained at the five-month follow-up. In addition, intentions to intervene increased from pre- to post-training and were maintained at five-month follow-up (Tompkins and Witt, 2009).

The second study was the only one of the three that used randomized assignment to construct a control group, and it did so to evaluate QPR training for middle and high school personnel (including teachers, administrators, and health and social service staff) (Wyman

[3] QPR is a widely used gatekeeper training that teaches people "how to recognize the warning signs of a suicide crisis and how to question, persuade, and refer someone to help" (QPR Institute, 2011).

et al., 2008). Using as-treated analyses, gatekeeper reluctance was significantly lower at one-year follow-up for those in the QPR training group, but reluctance did not differ as a result of training using intent-to-treat analyses[4] (Wyman et al., 2008). Finally, Bean and Baber (2011) examined the impact of the National Alliance on Mental Illness—New Hampshire's (NAMI-NH's) "Connect" program, a three-hour suicide prevention training session for youth and key adults in the community (e.g., police officers, educators, and mental health care providers). This study found that perceived stigma related to youth suicide and mental health care significantly decreased from pre- to post-training for both youth and adults who participated in gatekeeper training.

Does less reluctance affect intervention behavior? Limited evidence exists to date regarding the influence of reluctance to intervene on gatekeeping behaviors. In the study of college resident advisors, though the training reduced reluctance and increased self-reported intentions to intervene, training did not translate into a significant behavioral change in terms of self-reported gatekeeper behaviors (e.g., asking about suicidal thoughts, escorting a peer to professional help) (Tompkins and Witt, 2009).

Additional insight on how reluctance to intervene affects gatekeeping behavior can be gained from a study by Mishara, Houle, and Lavoie (2005). The authors evaluated the effects of gatekeeper training provided to friends and families of men who had already attempted suicide, or who were suffering from a major psychological or substance abuse problem. In a free response question, some gatekeepers reported that the main reason they did not directly ask about suicide was because they did not want to further upset the suicidal person or they were embarrassed to bring it up (Mishara, Houle, and Lavoie, 2005). Therefore, caregivers who act as potential gatekeepers may avoid the topic of suicide in conversation because of the stigma associated with mental illness, a label that would presumably cause further distress.

Does less reluctance result in fewer suicides or suicide attempts? No study to date has related improvements in or lower levels of reluctance with reduced rates of suicides or suicide attempts.

4. Self-Efficacy to Intervene

Self-efficacy to intervene is defined as an individual's belief that he or she will be able to identify, care for, and facilitate treatment for a person at risk of suicide.

Does training affect self-efficacy to intervene? There is mixed evidence that training can have a direct, positive impact on self-efficacy. Three single-group studies (i.e., studies without a comparison group) found that self-efficacy increased from pre- to post-training (Clark et al., 2010; Cross et al., 2007; Shim and Compton, 2010). One study with a randomly constructed control group found that those who participated in QPR training had higher mean levels of self-efficacy (controlling for baseline levels) than the control group (Wyman et al., 2008); however, another study did not find differences in self-efficacy post-training between the intervention and control group (LaFromboise and Howard-Pitney, 1995). In addition, Tompkins and Witt (2009) used a non-equivalent control group and found that self-efficacy to intervene increased for *both* the training and control groups over the course of the study. So,

[4] The intent-to-treat analyses used the training status that was assigned to the individual's school at the time of baseline measurement as each staff member's training status, whether the staff member fully participated in the training or not. The as-treated analyses used each individual's true training status by follow-up and also included random effects of the staff member's current school at follow-up to allow for potential variation in impact at the school level (Wyman et al., 2008).

although the most rigorous of the studies does suggest that training can increase self-efficacy to intervene, the others raise a question about the impact of training versus raising awareness. The limited evidence, especially from studies using comparison groups, means that questions remain about whether training can in fact improve participants' beliefs that they can identify, care for, and facilitate treatment for a person at risk of suicide.

One study found that the number of years since receiving training affected one's self-efficacy to intervene. King and Smith (2000) found that those who had attended suicide training within the past three years were more likely to report self-efficacy to intervene than those who had completed training longer than three years prior. The study consisted of a one-time survey of school counselors who had participated in suicide gatekeeper training at some point in the previous 13 years, thus testing differences in self-reported knowledge, declarative knowledge, and self-efficacy based on years since training. It did not include a comparison group that did not receive training, but findings nonetheless suggest that training boosters may be helpful to maintain preparedness to intervene after training.

Does increased self-efficacy affect intervention behavior? Evidence on the link between self-efficacy and gatekeeping behavior remains limited. For example, though self-efficacy improved (along with knowledge and reluctance to intervene) in the study by Tompkins and Witt (2009), there were no apparent improvements in gatekeeper behaviors (i.e., asking about suicide or referring those at risk of suicide to appropriate resources).

Does increased self-efficacy result in fewer suicides or suicide attempts? The connection between gatekeeper self-efficacy and suicide attempts and completions remains unstudied. It is unknown whether improvements in self-efficacy as a result of training are associated with reduced suicide rates.

Differences in Individual Characteristics

Individual characteristics of gatekeepers have also been found to relate to suicide knowledge, beliefs, attitudes, and intentions to intervene, as well as to how gatekeeper training can affect each of these. Individual characteristics refer to a person's age, sex, ethnic or racial background, prior experiences, health status, and so forth. Researchers have found that some of the key individual characteristics of relevance to suicide gatekeeping preparedness include sex, job type, and prior training in the field of mental health, as described below.

Sex. The most extensive evidence is on the impact of sex; females appear to be more knowledgeable, have more adaptive beliefs, and be more likely to intervene than males both before and after receiving gatekeeper training (Aseltine and DeMartino, 2004; Aseltine et al., 2007; Clark, 2010; Overholser et al., 1989; Spirito et al., 1988). Overholser and colleagues (1989) found that females had more previous experience intervening with suicidal individuals than males. Further, relative to male student gatekeepers, female students were more likely to seek help when personally depressed, intervene on behalf of friends, and report personal suicidal ideation or attempts in the three-month period following study completion (Aseltine and DeMartino, 2004).

In addition to the main effects of sex, there is mixed evidence regarding sex as a moderator of the benefits of gatekeeper training. Spirito and colleagues (1988) found that the effect of treatment group (training versus control) varied according to sex: Those who received gatekeeper training had significantly less reliance on maladaptive coping regarding suicide intervention than the control group, but this effect was only true for females. Thus, sex moderated the effect of training on maladaptive coping mechanisms. In contrast, a quasi-experimental

study of gatekeeper training for high school students found no moderating effect of training, and that in aggregate, participants who received training had more adaptive attitudes toward suicide post-training regardless of sex (Ciffone, 2007). Aseltine and colleagues (2007) also found that the effect of training on suicide knowledge, attitudes, help-seeking, or personal suicidal ideation or attempts at three-months post-training did not differ according to sex.

Job type or educational background. Job type and educational background have been widely examined in relation to suicide knowledge, beliefs, intentions to intervene, and the extent to which gatekeeper training can improve these. Not surprisingly, mental health professionals are more knowledgeable about suicide compared with other occupations, regardless of gatekeeper training (Cross et al., 2011; Matthieu et al., 2008). Cross and colleagues' (2011) study of QPR training with high school teachers, staff, and parents found that training improved knowledge about suicide for school staff and parents, but not for trained mental health professionals (Cross et al., 2011). However, two studies in a medical setting found that gatekeeper training improved knowledge about suicide and self-efficacy to intervene for both clinical and non-clinical staff (Matthieu et al., 2008; Tsai et al., 2011). In a study of Veterans Administration (VA) staff members, clinical and non-clinical staff members showed improvements from pre- to post-training, but non-clinical staff had greater gains (Matthieu et al., 2008). A study of gatekeeper training among nurses found that training improved risk assessment knowledge for both psychiatric nurses and nurses from other specialty areas, but did not report whether the increase was greater for one group than the other (Tsai et al., 2011).

The impact of gatekeeper training among school staff in various roles in an educational setting has also been examined. Gatekeeper QPR training did not affect actual intervention behavior among school personnel serving in a primarily surveillance role (i.e., administrators and support staff). In contrast, those serving in a direct communication role (i.e., teachers) who received the training were more likely to show notable changes in identifying suicidal behaviors in students compared to those in a surveillance role (Wyman et al., 2008). Training did not affect the frequency of asking about suicide and other intervention behaviors for support staff members. Tompkins, Witt, and Abraibesh (2010) also found that training improved high school teachers and administrators' knowledge and attitudes about suicide, but support staff either showed no change or negative shifts from pre- to post-training. One explanation may be that teachers and administrators already had relationships with distressed students and enhanced their conversations with students after training, whereas support or administrative staff may not have established those relationships.

Systemic Support and Competing Demands

Systemic support refers to the extent to which one's organization, supervisor, or coworkers support the role of gatekeepers to prevent suicide. This includes making resources and training available for gatekeepers. *Competing demands* refers to job-related roles and responsibilities that may interfere with fulfilling one's role as a gatekeeper. This includes the perception that job-related tasks require so much time at work that there is not enough time to adequately perform gatekeeper duties. Thus, although not the focus of gatekeeper training, these factors are part of the gatekeeping environment and are expected to influence intervention behavior.

Little attention has been given to how support and demands influence gatekeeping behavior. Our search identified one study that examined these factors: a cross-sectional, single-group study by Moore and colleagues (2011). The authors reported that supervisor and organizational support for gatekeepers was positively related to intervention behavior post-training. Addi-

tionally, organizational constraints (e.g., time demands) were negatively related to intervention behavior. Coworker support of gatekeeper behaviors did not affect using the intervention skills learned during training. Notably, the authors identified a trend whereby supervisor and organizational support buffered against the negative effects of organizational constraints in relation to intervention behavior (Moore et al., 2011). Thus, even in presence of organizational demands, individuals who were more supported in their gatekeeping role were more likely to intervene with individuals at risk of suicide.

Conclusions

Our theoretical model of gatekeeping, based on a comprehensive review of the literature, theorizes that gatekeeper training can impact four important factors—knowledge, perceptions about suicide prevention, reluctance, and self-efficacy—and that changes in these factors can influence intervention behavior. Though the research is scant, we can draw three general conclusions.

There is some evidence from the literature that gatekeeper training can improve knowledge, beliefs/attitudes, self-efficacy, and reluctance to intervene. The strongest evidence to date is that gatekeeper training can improve knowledge about suicide, but there is emerging research to suggest that it also can foster more adaptive beliefs about suicide prevention and decrease people's reluctance to intervene. The relationship between training and self-efficacy to intervene is more tenuous. These relationships have been shown in a number of settings and with different individuals. However, noticeably absent from this literature are studies of the U.S. armed forces, which rely critically on gatekeeping programs in their suicide prevention activities.

The transfer of knowledge, beliefs, and skills learned in training to actual intervention behavior is largely unstudied. Though there is increasing evidence that training affects knowledge, beliefs, and reluctance, research on how improvements in these factors translate to intervention behavior is lagging. In this instance, research is strongest linking reluctance to intervene to intervention behavior. Similarly, research has shown in one instance that a gatekeeper training program was causally associated with changes in suicides or suicide attempts. Specifically, Aseltine and DeMartino (2004) showed that those exposed to gatekeeper training had improved knowledge and more adaptive beliefs about suicide prevention that, in turn, were associated with fewer suicide attempts at three-months post-training. This study thus remains the strongest evidence to date suggesting that gatekeeper trainings can reduce suicide, though observational studies (e.g., Gordana and Milivoje, 2007) are also useful and have provided suggestive evidence to this effect.

> *Recommendation.* **Continued research is needed as to how knowledge, beliefs, self-efficacy, and reluctance are related to both intervention behavior and changes in suicide rates.** Ideally, such research would be experimentally based, in which groups are randomized to receive or not receive a gatekeeper training. This could occur in the Army and Marine Corps, where such training is already omnipresent, by focusing on new recruits. However, observational research and case studies could still provide evidence that both services could use to enhance or inform their current training programs.

Individual and contextual factors are associated with how effective gatekeeping programs will be. There is strong evidence that females have more knowledge about suicide, have more adaptive beliefs about suicide prevention, and are more likely to intervene with someone who may be at risk of suicide. However, there is mixed evidence that gatekeeper training differentially affects females and males. Job duties are also important, with gains of gatekeeper training effective for all—but perhaps more pronounced for those without prior mental health training—and changes in intervention behaviors seen primarily among those already interacting regularly with individuals at risk (e.g., teachers versus other school staff). There is also emerging evidence that contextual factors, such as organizational support of gatekeeping programs or competing demands placed on individuals, influence gatekeeping.

> *Recommendation.* **Future evaluation studies of gatekeeper training programs should examine the influence of support and competing demands.** Institutional support and competing demands may affect the transfer of knowledge and skills acquired in training to actual changes in intervention behavior. This may be particularly relevant for NCOs, who take on gatekeeping as a "collateral" duty in addition to a myriad of other responsibilities.

Gatekeeping programs are heterogeneous. Though our review synthesized research findings from multiple studies, the gatekeeper trainings studied varied widely. For some, gatekeeper training was part of an overarching suicide prevention strategy; sometimes, the training was offered to specific groups and focused exclusively on gatekeeping, while at other times, gatekeeping was targeted universally to all participants in addition to recommendations for self-care. In addition to varying target audiences, trainings also differed in their duration and the methods used to convey the information.

> *Recommendation.* **Research should examine the components and features of gatekeeper trainings that yield the most promising effects.** There is variability in the trainings offered in DoD, particularly for chaplains, and research may be able to exploit this variation to understand what training components and delivery methods are most likely to yield desired changes in specific populations.

APPENDIX

Description of Gatekeeper Studies

Table A describes various elements—source, program name, research sample, evaluation design, and principal finding(s)—of the gatekeeper studies included in the review of the empirical literature conducted for this report.

Table A
Description of Gatekeeper Studies

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Abbey, Madsen, and Polland, 1989	Short-Term Suicide Awareness Curriculum	73 college students	Students randomly assigned to one of three conditions (individual study, individual study plus lectures, and control) and completed questionnaires at baseline and four weeks later. Students with prior suicide intervention training or personal suicide risk were screened out of the study.	Students in the experimental groups outperformed control group participants on knowledge of suicidal warning signs, intervention strategies, and effective reflective listening, as well as higher competence in reacting to suicidal individuals. The students who also received lectures outperformed those who just received handouts on the some of the knowledge measures.
Angerstein, Linfield-Spindler, and Payne, 1991	Project SOAR (Suicide: Options, Awareness, and Relief)	51 high school and middle school counselors	A pilot study in which counselors completed a post-training evaluation and a questionnaire both pre- and post-training. No control group.	Pilot training was reviewed "very favorably" as measured by post-training ratings and comments. The suicide questionnaire showed significant learning of suicide-related facts among high school (but not all middle school) counselors.
Angerstein, Linfield-Spindler, and Payne, 1991	Project SOAR	150 administrators (principals, vice principals) and counselors	School staff were randomly selected to receive the training, and responses to a questionnaire conducted three-months later were compared with staff from districts that had not had any suicide prevention training in the preceding year.	Counselor awareness of suicide-related incidents, the knowledge of how and where to obtain assistance for suicidal students, and readiness to educate students and parents about warning signs were all higher for counselors with training than for counselors or administrators without training. Administrators who were exposed to SOAR appear to share the views more of non-exposure administrators and counselors than of SOAR-trained counselors.
Aseltine, 2003	SOS Suicide Prevention Program	Staff at 92 high schools	The safety, efficacy, and feasibility of implementing the SOS program was evaluated using data collected from 92 schools during the 2000–2001 school year. No control group.	There was a nearly 60-percent increase in help-seeking behavior among students in the 30 days immediately following program implementation compared to past-year averages (help-seeking behavior being defined as seeking counseling for depression or suicidal ideation). Overall evaluations of the training program in general received excellent ratings from school counselors/nurses.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Aseltine and DeMartino, 2004	SOS Suicide Prevention Program	2,100 high school students	Students were randomly assigned to training or to a waitlist control and completed questionnaires three months after implementation of program; clustering accounted for at classroom level.	Youth in the trained group were approximately 40 percent less likely to report a suicide attempt in the three months following training than youth in the control group. Participants also showed increased knowledge and awareness about depression (increased knowledge may partially explain fewer suicide attempts). That is, knowledge and attitudes mediated the effect of condition on suicide attempts.
Aseltine et al., 2007	SOS Suicide Prevention Program	4,133 high school students	Students were randomly assigned to training or to a waitlist control and completed questionnaires three months after implementation of program; clustering accounted for at classroom level.	This study augments previous work by Aseltine and DeMartino (2004) in evaluating the SOS program and includes additional data from the second year of the study. Youth in the trained group were approximately 40 percent less likely to report a suicide attempt in the three months following training than those in the control group. Participants in the trained group also showed increased knowledge and adaptive attitudes about depression and suicide. However, the number of suicidal ideations and incidents of help-seeking behavior in the three months following training did not differ between trained and control groups.
Bean and Baber, 2011	"Connect" community-based youth suicide prevention program	648 key adults within the community (i.e., police officers, educators, guidance counselors) and 204 high school students	Pre- and post-test questionnaires designed specifically to measure the changes in knowledge, attitudes, and beliefs that were expected to occur as the result of the Connect training sessions. No control group.	Participants in NAMI-NH's Connect program showed significantly increased correct knowledge about youth suicide, responsibility to intervene and self-efficacy to intervene were significantly higher, and stigma was significantly lower post-training as well.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Bryan, Dhillon-Davis, and Dhillon-Davis, 2009	Air Force Suicide Prevention Program (briefing with slides and videos)	286 airmen	Airmen completed questionnaires before and after the briefing. No control group.	The video did not affect one's emotional state differently if the viewer did or did not personally know someone who died by suicide (survivor vs. non-survivor). Suicidal female subjects showed a decrease in negative emotion. In general, there was a decrease in distress and increase in calmness between pre- and post-briefing responses. There was no observed difference in the emotional changes between survivors and non-survivors.
Capp, Deane, and Lambert, 2001	Aboriginal community gatekeeper training	44 workshop attendants who were part of the aboriginal community	Participants completed pre- and post-training questionnaires. No control group, but responses were compared with student norms.	Workshop participants experienced an increase in knowledge about suicide and greater self-efficacy in identification of people who are suicidal. No evidence of a change in intentions to help. Intentions to refer decreased from pre- to post-training. Some support that as self-efficacy to identify and help increased, intentions to refer to a mental health service decreased.
Centers for Disease Control and Prevention, 1998	Suicide Prevention in a Western Athabaskan Tribe	3,225 Western Athabaskan tribal members with 328 high school students ages 15–19	Rates of suicidal acts were compared before and after the program as well as between the targeted age group and the entire population.	The prevention program was implemented in 1990. The rate of suicidal acts (attempts and deaths) decreased greatly for the targeted age group immediately following the initiation of the program and then plateaued. Meanwhile, the rates for other age groups remained steady.
Chagnon et al., 2007	Intervention Training Program for Youth Suicide Prevention	71 "experienced" educators and youth community leaders in youth intervention	Participants signed up for one of eight training dates. The dates were randomly assigned to experimental (training) or control condition. Participants in the experimental condition were assessed three times: prior to the training (T1), immediately after (T2), and six months later (T3). Control group participants were assessed on two occasions, three weeks apart.	The experimental group's knowledge, attitudes, risk assessment, and intervention skills increased from pre- to post-training, and the changes were significantly greater than for the control group. Gains with respect to attitudes were maintained six months after training. Helpers' level of knowledge and skills diminished compared with the level attained immediately after the training. However, knowledge, attitudes, and skills at six months were still higher than prior to training.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Chan et al., 2011	Elderly suicide prevention program	471 elderly with history of a suicide attempt	Suicide deaths and attempts over two years were compared between suicide attempters enrolled in an elderly suicide prevention program (ESPP) and a historical comparison group of elderly suicide attempters. Additionally, suicide rates among older adults were examined at the population level to measure the possible effect of ESPP on trends of suicide rates in older adults in pre- and post-intervention periods.	There were fewer suicide deaths in the period after program implementation than the period before, regardless of depression/mental health status. Suicide attempts did not differ after program implementation. Reductions in suicides were observed in females age 85 and older, but not for males age 85 and older nor men aged 65–84.
Ciffone, 1993	Teens Who Choose Life	324 high school students	Participants were surveyed pre-test and 30 days later, during which time the training group participated in the program. Comparisons were made between the trained and non-trained (control) adolescents.	At the baseline period, a sizable proportion of surveyed students did not hold "sensible or accurate" views on suicide. Thirty days later, participants in the training group always responded with more desirable attitudes compared with those in the relevant control group. Participants in the training program experienced a significant shift from undesirable to desirable responses in most domains.
Ciffone, 2007	South Elgin High School Suicide Prevention Program	421 high school students	Training was administered in two high schools, each of which had a control and treatment group. Questionnaires were administered once before training and three weeks later. Comparisons were made within treatment groups, between treatment and control groups, and between treatment groups.	Improvements were observed for suicide attitudes from pre- to post-treatment for members of the treatment group at both schools. There was greater change comparing the treatment group responses with the control group responses. No significant difference was observed between the treatment groups at the different schools, nor between males and females (i.e., neither school nor sex modified the effect for attitudinal changes).

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Cigularov et al., 2008	Raising Awareness of Personal Power	779 high school students	High school classes were randomly assigned to the treatment or control group, which also received the training but started it later than the treatment group (rolling group design). Change from pre- to post-test was compared between materials included and not included in the training (internal referencing strategy). Success of the program was also evaluated based on whether two minimum criteria were met (minimum competency approach): (1) 70 percent of participants correctly answering knowledge post-test items, and (2) 90 percent of participants liked the program and found it useful.	In the rolling group design, there were improvements in knowledge, attitudes, and efficacy for both the treatment and the control groups. Using the internal referencing strategy, there were improvements on trained materials, but little improvement on the untrained yet relevant materials. In the minimum competency evaluation, results showed that the program exceeded the minimum standards.
Clark et al., 2010	Samaritans of New York Suicide Awareness and Prevention Programme	365 community- and school-based staff	Pre- and post-test questionnaires to measure knowledge about suicide and suicide prevention and ability to intervene with individuals at risk of suicide. In addition, the study also explored the influence of previous exposure to suicidal individuals as well as other predictors on gains subsequent to training. No control group.	Results indicate increased self-efficacy after suicide prevention training. Trainees with higher levels of education and previous contact with suicidal individuals were significantly more likely to indicate gains in self-efficacy after training.
Cross et al., 2007	Question, Persuade, Refer (QPR)	76 nonclinical employees (staff, secretaries) in a university hospital workplace setting (from the Department of Psychiatry)	The goals of this pilot study were to (1) study changes in knowledge and self-efficacy, including intervention skills, from a brief gatekeeper training; (2) assess the feasibility of incorporating active learning principles (i.e., role-play practice) into standardized gatekeeper training; and (3) examine employee satisfaction with, and diffusion of information from, gatekeeper training conducted in the workplace (e.g., share the training information with family and friends). No control group.	Pre/post analyses showed positive changes in participants' knowledge about suicide and self-efficacy about intervention.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Cross et al., 2011	A community-based partnered project using the QPR training program	114 school staff (teachers/aides/ administrators, mental health professionals, and bus drivers) and 56 parents in a school community	Participants were randomly assigned to training as usual or training plus a group practice opportunity and completed questionnaires pre-training, post-training, and at three months.	Both training conditions resulted in enhanced knowledge and self-efficacy at post-test.
Deykin et al., 1986	Training for adult community members who interact with at-risk youth	419 patients across two hospitals	Training was offered at one hospital and not another, which served as the control group. Hospital administrative data was reviewed once prior to the intervention and once during the intervention period.	Treatment subjects were significantly more likely to comply with medical recommendations than were the control subjects. There was an increase in the rate of treatment subjects seeking help for suicidal thoughts, with no comparable increase among control subjects. No other significant differences were observed: The number of patients admitted to the hospital with suicide risk did not change at either the treatment or control hospitals from pre/post program implementation. The intervention did not reduce repeat episodes of hospital admittance with suicide risk. No study participants died from suicide in the following years, and it is unknown whether the intervention reduced suicide mortality at the hospitals or among participants.
Freedenthal, 2010	Yellow Ribbon Suicide Prevention Program	168 staff and 146 students at a high school	Staff and students were given questionnaires before training and 6–8 months later (experimental group). Changes in responses among staff members were compared with those of staff surveys of a peer high school (control group) that did not use the program, though the student group did not have a control.	No evidence of an increase in the frequency of student help-seeking behavior, or in the variety of sources utilized on average. Student help-seeking via a friend or parent actually decreased, while crisis-hotline calls increased marginally. No difference in help-seeking rates between experimental or control schools, except for an increase in student disclosure to staff at the control school and a decrease in disclosure to staff at the experimental school.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Gordana and Milivoje, 2007	Suicide Prevention Program in the Army of Serbia and Montenegro	Military (army of Serbia and Montenegro)	Suicide rates for the army of Serbia and Montenegro were compared before (1999–2003) and after (2004–2005) program implementation. Additionally, these data were compared with data on a control group of male civilians.	The total number of suicides in the army of Serbia and Montenegro decreased significantly during the program. This result is attributed to "greater knowledge and more adaptive attitudes toward depression and suicide observed among soldiers in the suicidal group" by the study's authors.
Gullestrup, Lequertier, and Martin, 2011	MATES in Construction (multicomponent intervention including "connector" gatekeeper training)	7,666 adult construction workers	Workers at different work sites were randomly assigned to either complete part of the General Awareness Training (GAT) questionnaire before and part after GAT (intervention group), or to complete all of the items pre-GAT (control group). Analysis compared treatment and control group on responses to "pre–GAT-training" and "post–GAT-training" questions, which were two separate sets of questions.	No differences in pre–GAT-training attitudes and knowledge about suicide between intervention and control group. However, intervention group showed significantly more "correct" attitudes and knowledge on post–GAT-training questions compared with control group. Of the 696 participants who completed "connector training" (gatekeeper training), most reported feeling knowledgeable and prepared to intervene (self-efficacy) and found the training helpful. Most intended to share information they learned with others. After-hours calls to the hotline increased over the course of study. Postvention support was provided at ten sites (eight for suicide, one a lethal accident, one accidental death outside work hours). None of deceased workers had attended GAT.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Hall and Gabor, 2004	"SAMS in the Pen" (Samaritans of Southern Alberta in the Penal Institution)	Medium-security penal institution inmates (17 volunteer gatekeepers, 126 general inmates), and staff (27 correctional officers, 14 parole officers, and 12 "other" professionals [e.g., nurses, mental health staff])	Cross-sectional data collection through record review of three years and interviews with stakeholders (volunteers, correctional staff, general inmates, and professional staff) at one time point. No control group.	No statistical analyses were conducted. There was skepticism about the ability to implement the program in certain situations. SAMS volunteers generally reported in interviews that they were confident in their skills (self-efficacy to intervene) and that their communication skills improved. The general inmate population rated the service as "okay"; COs (correctional officers) had lower satisfaction with the program. Professional staff were more supportive of the program than COs, but still had reservations. The rate of suicides appeared to decrease, but this was not examined for statistical significance. Emotional problems (40 percent) were the most frequently occurring concerns reported during inmate contact with a volunteer.
Hegerl et al., 2006	Nuremberg Alliance against Depression	750,000 residents (480,000 intervention region, 270,000 control region)	The number of suicidal acts in Nuremberg, Germany, where the intervention occurred, was compared with the pre-intervention data in Nuremberg as well as the data from the control region (Wuerzburg, Germany). The intervention trained 2,000 community members (police, teachers, counselors) in gatekeeping practices.	The intervention region observed a reduction in the number of suicidal acts (attempts and deaths) during the intervention period in comparison to the control region. This reduction was also observed when considering suicide attempts alone, but not when considering suicides deaths alone.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Hegerl et al., 2010	Nuremberg Alliance against Depression	750,000 residents (480,000 intervention region, 270,000 control region)	The number of suicidal acts in Nuremberg, Germany, where the intervention occurred, at a one year post-intervention follow-up was compared with the pre-intervention baseline data in Nuremberg as well as to the data from the control region (Wuerzburg, Germany).	In the intervention region, a significant reduction in suicidal acts (relative to baseline) was observed at the one-year follow-up, which is consistent with the trends observed during the intervention (Hegerl et al., 2006). The effect was also significant with respect to the control region. Similar to the results found during the intervention, there were significantly fewer suicide attempts in the intervention region than in the control region, but the difference in suicides was not significantly different from baseline in either region. A greater decrease in "high-risk" methods than in "low-risk" methods of suicide attempts was observed.
Ho et al., 2011	Kaohsiung Suicide Prevention Center (KSPC)	Residents of Kaohsiung City, Taiwan, with past suicide attempts or who had called a crisis hotline in the past were tracked for suicidality. Over 200 gatekeepers were trained (nursing home workers, community volunteers, medical practitioners, etc.).	The evaluation used a pre/post design to evaluate the effectiveness of the KSPC's programs using monthly Bureau of Health data to track suicide rate changes since the center's opening in 2006.	From 2005 to 2008, suicide rates decreased, KSPC crisis-line calls increased, the number of KSPC telephone counseling sessions increased, and suicide attempt reporting increased.
Indelicato, Mirsu-Paun and Griffin, 2011	University-wide suicide prevention program using the QPR gatekeeper training program	1,375 university staff, faculty, and students	Questionnaires administered at pre-training, one month after, and at three months after examining suicide-related knowledge and prevention skills, group differences in suicide prevention knowledge and skills, group differences in confidence and comfort levels, and changes in participants' beliefs that the interventions they conducted were effective. No control group.	Results showed significant increases in self-rated knowledge about suicide, awareness of resources, belief in the appropriateness of discussing suicide, confidence in responding to and interacting with the suicidal person, comfort talking about suicide, and the likelihood they would ask someone about suicide.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Kalafat et al., 2007	Lifelines	2,090 school administrators, faculty, staff (gatekeepers), and students	Surveyed students in 12 schools that received the program, and in two comparison schools. Also assessed fidelity of program implementation in all study schools through observation.	Pre/post analyses found that students who participated in the Lifelines program showed significant pre/post differences in knowledge, attitudes about suicide and intervention, and seeking adult help. Students were also significantly less likely to "Keep Friend's Secret" at post-test. Analysis of differences between the two study/two comparison sites found the intervention schools improved significantly more than comparison schools on all the above changes.
Kaleveld and English, 2005	Regional Trainers Sustainability Plan	Teachers, nurses, psychologists, community workers (*n* not presented)	Process evaluation to assess participants' (a) reaction to training; (b) delivery and dissemination of training; (c) learning after the training; (d) behavior change; and (e) suicides prevented. No control group.	Some evidence of success for all processes measured, though insufficient information presented to warrant any significant discussion.
Kato et al., 2010	Based on Mental Health First Aid	44 medical residents in Japan	Self-administered assessments were delivered before and immediately after the intervention (pre-test and post-test) and six months after the intervention (follow-up). No control group.	Most rated the training program as helpful or very helpful. Participants' attitudes toward people with mental health problems and self-efficacy improved from pre- to post-training. At six-month follow-up, attitudes and self-efficacy remained higher but not significantly different from pre-training. Overall intervention skills improved from pre- to post-training, but not at six-month follow up. Social distance toward depressed people worsened from post-training to six-month follow-up. In the six months following training, 22 participants reported 41 clinical contacts with probable suicidality. In six cases, they directly asked about suicide. In almost all cases, they reported that they listened non-judgmentally, gave support, and encouraged them to seek help from a professional.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
King and Smith, 2000	Project SOAR	186 school secondary, middle, and elementary school counselors	A one-time survey of counselors who had completed SOAR training at some point (up to 13 years prior to the study), designed to examine whether counselors (1) perceive themselves to be knowledgeable about the district's suicide policies and procedures, (2) know the risk factors for student suicide, (3) know the appropriate steps to take when a student assesses at high suicidal risk, and (4) have high levels of efficacy expectations regarding suicide prevention. No control group.	Most counselors felt knowledgeable about suicide policies/procedures. Most counselors knew the risk factors for suicide, except a significant portion incorrectly thought drug use (16 percent), easy access to a handgun (30 percent), and homosexuality (59 percent) were risk factors. Most counselors also correctly identified suicide intervention steps and reported feeling confident that they could effectively offer support to a suicidal student (self-efficacy).
LaFromboise and Howard-Pitney, 1995	Zuni Life Skills Development	128 American Indian adolescents	Classrooms were assigned to condition and no-condition, but not randomly. Self-report, external observation, and peer observation were compared pre- and post-intervention.	No differences between intervention and control groups on self-efficacy to intervene. Intervention students demonstrated a higher level of suicide intervention skills than no-intervention groups.
Matthieu et al., 2008	Gatekeeper training based on QPR program	602 clinical (psychologists, social workers) and nonclinical (administrative) Veterans Administration (VA) staff in a Vet Center. Targeting military (veteran) populations	A pre- and post-test study design was used to assess the impact of the VA's community gatekeeper training for suicide prevention program. Both clinical and non-clinical VA staff was surveyed. No control group.	Declarative knowledge, perceived knowledge, and self-efficacy all significantly improved from pre-training to post-training, with the larger effects being found in the non-clinical staff.
Matthieu et al., 2009	Gatekeeper training based on QPR program	21 clinical (psychologists, social workers) and nonclinical (administrative) VA employees. Targeting military (veteran) populations	This is a one-year follow-up of the study described in Matthieu, 2008. No control group.	Declarative knowledge and self-efficacy improved from pre- to post-test, but only self-efficacy remained significantly higher at one-year follow-up compared with pre-training. At one-year follow-up, respondents still rated training as valuable, recommendable, and comfortable. 76 percent reported that they perceived themselves to be acting more like a gatekeeper at work. Only 13 of 19 respondents said they made at least one referral at the one-year follow-up (number of referrals made ranged from zero to ten). 85 percent reported sharing the info they learned in training, most often with a coworker.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
May et al., 2005	Adolescent Suicide Prevention Project	Community volunteers of all ages (*n* not provided)	Descriptive analysis of suicide attempts, gestures, and fatalities from clinical records for two years before program implementation and 13 years of the program; regression analyses examined these outcomes as predicted by time (in years).	Evidence for steady reduction over time of suicide attempts and gestures, but no indication of change in suicide deaths (low base rates of 1–2 suicides per year at baseline are probably the reason decrease cannot be detected). Total self-destructive acts (gestures, attempts, and completions) decreased by 73 percent over the entire span of the program (13 years).
Mellanby et al., 2010	Applied Suicide Intervention Skills Training (ASIST) and safeTALK	17 veterinary students; 5 veterinary teaching staff	After participating in the workshops, students and staff completed questionnaires and attended a focus group to give feedback. No control group.	Both workshops were positively received by participants. Participants in safeTALK and ASIST self-reported that they had higher knowledge about suicide and risk factors, communication skills, intentions to intervene, and intentions to refer.
Melle et al., 2006	Early Detection Program	281 adults with schizophrenia or other psychotic disorders (e.g., schizoaffective, schizophreniform)	The suicidal behavior of patients seeking initial treatment for psychosis in the communities with early psychosis detection programs was compared with that of patients in the control communities (without early psychosis detection programs).	Patients in early detection communities presented with significantly less suicidal behavior (thoughts, plans, or attempts) at the time of first clinical treatment than those in the control communities lacking early detection programs.
Mishara, Houle and Lavoie, 2005	Suicide Action Montreal (SAM)	120 friends and family of suicidal men (who had either already tried to commit suicide once or who were suffering from a major psychological or drug/alcohol abuse problem). The third parties (friends/family) had contacted Suicide Action Montreal. Gatekeepers are the family or friends of a suicidal man.	Pre-test, post-test, and follow-up questionnaires were administered to participants who received each of five different support styles, though participants were not randomly assigned. Questionnaires contained questions about gatekeepers themselves as well as about the suicidal man. Questionnaires to the family/friends addressed issues such as coping mechanisms and utilization of resources, whereas the questionnaires related to the suicidal man included topics such as suicidal behaviors and alcoholism. Some topic areas overlapped. No control group.	Participants reported that suicidal men were less likely to have suicide attempts or ideation and depressive symptoms post-training, and these effects were maintained at the six-month follow-up. The programs did not increase knowledge/use of resources for the participants or suicidal man. Participants reported that treatment did not reduce the suicidal man's use of alcohol/drugs. On the pre-test questionnaire, participants also reported some reasons for not discussing the man's suicidal intentions with him: 32 percent cited not wanting to upset the suicidal person, and 21 percent reported feeling embarrassed or ashamed to discuss the issue of suicide.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Moore et al., 2011	ASIST or QPR	193 community members from various occupations who work directly with youth ages 10–18 enrolled in the juvenile justice or child welfare systems. Most were counselors, social workers, teachers, and probation officers.	This study was an examination of barriers and facilitators of gatekeeping. An online survey was administered at one time point with individuals who completed ASIST or QPR gatekeeper training programs in their workplace. The sample was selected from a database of gatekeepers participating in a larger evaluation study of gatekeeper training effectiveness.	No differences in ratings of situational obstacles or support between ASIST and QPR participants. Situation obstacle to gatekeeping faced most frequently was "There is not enough time at work to adequately perform the role of gatekeeper." Situational obstacles were negatively related to suicide prevention behaviors, and support from supervisors and the organization, but not support from coworkers, was positively related to suicide prevention behaviors.
Nelson, 1987	Youth Suicide Prevention School Program	390 high school students, teachers/staff, parents.	The study compared questionnaire responses of a pre-training sample with a comparable post-training sample of different students from the same schools. Feedback evaluations were also obtained from an additional sample of students who took the course, and from school staff and parents who completed the seminar. No control group.	Significant gains were observed in the first two years of the program in knowledge and attitudes about suicide for high school student gatekeepers. School staff and parent gatekeepers indicated that they most appreciated receiving practical advice (e.g., understanding suicide warning signs) and resources they could use in responding to a potentially suicidal young person. 96 percent of students felt the course was helpful in preventing suicide in young people.
Overholser et al., 1989	Suicide Awareness Programs in Schools	471 high school students	Baseline measures of knowledge, attitudes, coping strategies, and hopelessness were compared with post-test responses for students receiving the curriculum as well as a control group. Additional comparisons were made by sex and by personal experience with suicide.	After the curriculum, female students showed significantly reduced hopelessness, more appropriate attitudes, and less reliance on maladaptive coping strategies, whereas male students demonstrated an increase in hopelessness, less appropriate attitudes, and an increase in maladaptive coping strategies. Students who had personal experience with suicide were more likely to learn the curriculum material.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Rozanov, Mokhovikov and Stiliha, 2002	Ukraine Military Suicide Prevention Program	Suicides tracked for all Ukraine military members.	An analysis of the total number of suicides before and after completion of a training program. Suicides tracked from 1988 to 2001. The suicide prevention program began in 1999.	The average suicide index was highest among warrant officers, twice the rate of officers as a group. The safest group was sergeants. Medical staff, psychologists, educational officers, and unit commanders correctly answered an average of 50 percent of questions related to suicidal behavior before the training. Suicide rates decreased during the two-year implementation of the suicide prevention training program, with zero in the first year of the program.
Shaffer et al., 1990	Mixed high school suicide awareness/ prevention curricula	1,551 9th grade high school students	Four experimental schools with suicide awareness/prevention training programs were compared with three control schools that did not receive any training. Attitudes and reactions to the training program that self-reported attempters had were compared with feelings that self-reported non-attempters had.	Treatment condition did not have an effect on changes in knowledge or attitude scores from pre- to post-program, although the experimental group had greater gains than the control group. The items where students improved the most from pre- to post-program were intentions to keep suicidal feelings to ones' self and believing that suicide is an option. Attempters' reactions to the program's usefulness were generally more negative than those of non-attempters.
Shaffer et al., 1991	Curriculum-based suicide prevention programs for teenagers	1,438 high school students	Each of three programs was delivered to two treatment schools (total of six treatment schools) at the classroom level and withheld from five control schools. The three programs shared the same goals but "differed in emphasis and technique." Pre-program and post-program surveys were compared within schools, between programs, and against control schools.	Most students found the programs to be positive, helpful, and informative. 10 percent reported they or a friend were upset by the content of the program. Students in the treatment group had significantly greater gains in knowledge of resources available for suicidal individuals than the control group. The study also found a small but significant increase among those in the treatment group who indicated that suicide could be a potential solution to problems. There were no treatment effects for changes in attitudes toward suicide and help-seeking.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Shim and Compton, 2010	Managing Suicidality in the Emergency Department	54 emergency department personnel with a convenience sample of clinicians	Questionnaires pertaining to knowledge and self-efficacy were administered pre- and post-training. No control group.	Pre-test and post-test measures showed an increase in knowledge and self-efficacy scores regarding management of suicidality in the emergency department immediately after participating in the training session.
Spirito et al., 1988	Suicide Awareness Curriculum	473 high school students	The program was delivered to three schools and withheld from two control schools. Pre-program and post-program questionnaires were compared within schools and against the controls. Used a Solomon four-group design to compare pre/post differences and minimize history effects.	Students participating in the program demonstrated an increase in knowledge of suicide. The curriculum was not shown to have an effect on attitudes of students or actual intervention behavior.
Stuart, Waalen, and Haelstromm, 2003	Peer Gatekeeper Training Program	65 high school students	Pre-training intervention skills and knowledge among peer helpers were compared with skills and knowledge immediately post-training and at three-month follow-up.	Intervention skills and knowledge of warning signs had significant gains from pre- to post-test, and the gains were maintained at three-month follow-up. Attitudes about suicide intervention improved significantly from pre- to post-test. There was a significant decrease in attitudes between post-test and follow-up, but follow-up attitudes were still significantly better than at pre-training. Thus, peer helpers became more like the experts in rating the appropriateness of intervention responses. There was a dramatic shift in participants' ability to ask specific questions about suicide ideation (measured with open-ended responses to a vignette). However, more subtle signs of suicide ideation and depression were still missed after training.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Tompkins and Witt, 2009	QPR	240 college residence advisors (RAs)	Pre-test and post-test assessments on gatekeeper readiness were compared in a non-equivalent waitlist control group.	QPR gatekeeper training delivered to RAs resulted in increased appraisals of preparedness, efficacy, and intentions to intervene. Changes in these variables were maintained at the five-month follow-up. However, these changes in appraisals did not translate into sizable behavior change in terms of self-reported gatekeeper behaviors. Knowledge improved at post-test, but returned to baseline at five-month follow up.
Tompkins, Witt, and Abraibesh, 2010	QPR	141 school personnel	Pre-test and post-test assessments on gatekeeper readiness were compared in a non-equivalent control group design.	Significant gains in suicide-relevant knowledge and attitudes were demonstrated from pre- to post-test. Control group participants evidenced significant gains in terms of their intent to intervene and question when encountering suicidal youth.
Tsai et al., 2011	Gatekeeper Suicide-Awareness Program	195 nurses	Randomized controlled trial comparing those who received and did not receive training on awareness of suicide warning signs and responses to encountering a potentially suicidal individual, measured both pre- and post-training.	At post-training, nurses who participated in the training were significantly more aware of suicide warning signs/risk assessment and significantly more willing to refer patients for professional counseling.
Vieland et al., 1991	Curriculum-based suicide prevention programs for teenagers	381 high school students	This was an expansion of a previous study (Shaffer et al., 1991) that took measurements at pre-test and then again at a 4–6-week follow-up.	Females were significantly more likely to endorse all of the behavioral outcomes: speaking with a friend about their depression, personally struggling with depression, and seeking help. The study failed to find convincing evidence of any program effect at 18-months post-training. None of the six behavioral outcomes were significantly different between treatment groups. There was also no evidence that the program had an effect on suicide attempt rates among exposed teens. Of the exposed group, 2.5 percent reported having made a (first) suicide attempt during the 18 months of follow-up compared with 2.7 percent of the control group.

Table A—Continued

Source Citation	Gatekeeper Program Description	Sample	Evaluation Design	Findings
Wyman et al., 2008	QPR	342 school personnel (teachers, administrators, health/social service staff, support staff) and students across 32 schools.	Randomized controlled trial to assess the impact of training on school staff's knowledge, appraisals, and willingness to assume a gatekeeper role, and suicide identification behaviors with students. Also tested whether QPR had a differential effect by contrasting gatekeeper surveillance model (training about knowledge of risk factors and attitudes toward toward preventing suicide should increase referral behaviors of trained staff) and communication model (a subset of staff must be actively engaged with the suicidal individual and that his/her attitudes and behaviors interact with that of the gatekeeper to influence the gatekeeper's effectiveness). Questionnaire administered pre-training and at one-year follow-up.	At the one-year follow-up, those in the training condition had significantly higher knowledge, perceived preparedness, self-report of knowledge, gatekeeper efficacy, and access to services compared with pre-training. With as-treated analyses, gatekeeper reluctance was significantly lower at one-year follow-up, but there was not a significant difference with intention-to-treat analyses. Findings from this study were consistent with the gatekeeper communication model, meaning that identifying more students at risk of suicide will require increasing open communication between the gatekeeper and suicidal student; increased knowledge and appraisals are not sufficient.
Wyman et al., 2010	Sources of Strength (SOS)	High school students (453 peer leaders; 2,675 students)	Compared changes in protective factors among peer leaders trained to conduct school-wide messaging and among the full population of high school students through pre- and post-intervention assessment. High schools were randomly assigned to immediate intervention or waitlist control.	Training improved the peer leaders' adaptive norms regarding suicide, expectations that adults help suicidal students, rejection of codes of silence, and school engagement, and decreased the perception that suicide is an acceptable response in difficult times. The largest gains were for those entering with the least adaptive norms. Trained peer leaders were four times as likely as untrained peers to refer a suicidal peer to an adult (intervention behavior). At the student population level, students at schools where the intervention occurred had significantly higher perceptions of adult support for suicidal youths and the acceptability of seeking help than students in untrained schools.

Abbreviations

ASIST	Applied Suicide Intervention Skills Training
DoD	Department of Defense
NAMI-NH	National Alliance on Mental Illness—New Hampshire
NCO	noncommissioned officer
QPR	Question, Persuade, and Refer
SOAR	Suicide: Options, Awareness, and Relief
SOS	Signs of Suicide
VA	Veterans Administration

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