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SUICIDE PREVENTION AND THE WORKPLACE

by

Leah Marie Wentworth

A thesis submitted in partial fulfillment
of the requirements for the Doctor of Philosophy
degree in Occupational and Environmental Health in the
Graduate College of
The University of Iowa

December 2016

Thesis Supervisor: Professor Corinne Peek-Asa

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Graduate College
The University of Iowa
Iowa City, Iowa

CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

Leah Marie Wentworth

has been approved by the Examining Committee for
the thesis requirement for the Doctor of Philosophy degree
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ABSTRACT

The long-term goal of this research is to reduce the number of deaths by suicide. Suicide is the leading cause of violent death in the United States, and is currently the 10th most common cause of death across all age groups. Suicide prevention efforts have historically been focused on youth/young adults, and the elderly, with less attention on programming for individuals in the working years. Our intention is to generally broaden the understanding of suicide, depression, and the workplace, with the hope of improving interventions for this underserved population.

The research activities outlined below were conducted under the auspices of a larger quasi-experiment at the University of Iowa. We first sought to assess the experiences of professional, nonclinical staff identifying and responding to apparently mental health problems in the workplace. We looked at the impact of two exposures on engagement with individuals in crisis: self-reported contact (the number of students or coworkers a participant interacted with each week), and participation in any suicide prevention training/programming over the previous five years. High contact with students was generally associated with a greater capacity for recognizing and responding to depression and potential suicidality. In contrast, the association between high contact with employees and recognition and response was insignificant for four of the six recognition and response behaviors. Participation in any form of suicide prevention training or programming in the previous five years was highly associated with recognizing and responding to depressed or suicidal coworkers and students.

Next, we considered the impact of a personal prior experience with suicide and prior suicide prevention training/programming on four constructs: preparedness to

respond to someone in crisis, familiarity with appropriate resources, gatekeeper self-efficacy, and gatekeeper reluctance. Suicide prevention training/programming was significantly associated with higher perception of three constructs: preparedness, familiarity, and self-efficacy. There was no statistical difference in reluctance between previously training participants and participants who had not previously taken suicide prevention training or programming. Individuals who had a personal prior experience with suicide were less reluctant to engage, although the results were not significant. There was an association between individuals who had a personal prior experience with suicide and suicide prevention training/programming, suggesting that individuals with a personal connection to suicide might be more likely to enroll in suicide prevention programming.

Finally, we examined how a suicide prevention training programming impacted the perception of safety culture in the workplace. On the 10 item safety scale, there was a significant difference between the means scores reported by the intervention and control group on 7 of the 10 questions. Individuals who participated in QPR gatekeeper training reported a higher sum safety culture score than individuals who did not participate in the training; the overall model was statistically significant.

This project shows that suicide prevention training/programming of any kind in the workplace can have a persistent, positive training impact on employees by informing and empowering them to act. It suggests that individuals with a personal prior experience with suicide may be more likely to take suicide prevention training, and may be less reluctant to engage with someone in crisis. It also demonstrates that suicide prevention

training may have a positive impact on other workplace psychosocial factors, and deserves prioritization in workplace wellness programming.

PUBLIC ABSTRACT

Suicide is the 10th leading cause of death in the United States, and is the leading cause of violent death. Recent research suggests that working-aged individuals are at increased risk for death by suicide.

We looked at the impact of two exposures on engagement with individuals in crisis: self-reported contact (the number of students or coworkers a participant interacted with weekly), and participation in any suicide prevention training/programming over the previous five years. High contact with students was associated with a greater capacity for recognizing and responding to depression and potential suicidality, while high contact with employees was not generally associated with greater engagement. Participation in any form of suicide prevention programming in the previous five years was highly associated with recognizing and responding to depressed or suicidal coworkers and students.

Next, we considered the impact of a personal prior experience with suicide and prior suicide prevention training on four constructs: preparedness to respond, familiarity with resources, gatekeeper self-efficacy, and gatekeeper reluctance. Suicide prevention training/programming was associated with three constructs: preparedness, familiarity, and self-efficacy. We also found an association between individuals who had a personal prior experience with suicide and suicide prevention training, suggesting this is an important target population.

Finally, we examined how a suicide prevention training programming impacted the perception of safety culture in the workplace. Individuals who participated in QPR

gatekeeper training reported a higher sum safety culture score than individuals who did not participate in the training, indicating a higher perception of safety culture.

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CHAPTER 1

THE STUDY OF SUICIDE

Introduction

Suicide, defined as a fatal, self-inflicted injury with the intention to end life, is often viewed solely as a personal tragedy. But it is also a major public health problem. Suicide is the leading cause of violent death in the United States, and is currently the 10th most common cause of death across all age groups, with a population rate of 13.4 per 100,000 (Drapeau & McIntosh, 2015). The suicide rate for the general population has been steadily rising over the past ten years, after decades of decline (“American Foundation for Suicide Prevention - Facts and Figures,” 2014). It is worth noting that these numbers are probably underestimating the true number of suicides, and the cost to society as a function of suicides. Deaths that are questionable, such as single car vehicle accidents and overdoses that are assumed to be unintentional are not included in data on suicide. The calculated cost to the United States as a function of suicides, suicide attempts, and suicide ideation is approximately 11.8 billion in lost income per year (Goldsmith et al., 2002).

Suicide presents differently across a number of groups. Men make up the overwhelming majority of suicide deaths in the United States—almost 80% of all suicides in 2014 (Drapeau & McIntosh, 2015). While there is no official reporting mechanism for non-fatal, intentional self-harm, the literature consistently estimates 3 female attempts for each male attempt (Centers for Disease Control and Prevention, 2009). Men tend to use more lethal methods for suicide (firearms, asphyxiation), which

contributes to the difference in ratio of attempts to completions (Callanan & Davis, 2012).

Race and ethnicity also contributes to differences in suicidality. The CDC reports Native Americans and Alaskan Natives have strikingly high rates of suicide—from 2005-09, the rate for this population was 17.48 per 100,000; males among this group have even higher rates of suicide. Whites also bear a significant burden of suicide—the rates for whites are higher than the general population, and of the approximately 41,000 suicide deaths in 2013, over 90% occurred among non-Hispanic whites (Mcintosh & Drapeau, 2015).

The relationship between suicide and age has been changing in recent years. While the suicide rate per 100,000 among youth and young adults has consistently been lower than the population average, suicide is consistently one of the top five causes of death among young people (Crosby, Han, Ortega, Parks, & Gfroerer, 2011). Historically, the risk of suicide has increased with age, with the highest rates among men over 80 years of age (Hu, Wilcox, Wissow, & Baker, 2008). However, the population dying by suicide has dramatically changed; individuals in the middle years (35-64) experienced an almost 30% increase in suicide rates from 1999 to 2010, and have replaced the elderly as the group most likely to die by suicide (Centers for Disease Control and Prevention, 2013).

A Short History of Suicidology

The academic study of suicide largely began at the end of the 19th century with Emile Durkheim. In Le Suicide, he argued that all suicides derived from some tension

with society; an excess of belonging to a society, or a lack of it, for example (Durkheim, 1897). His theory largely ignored personal factors like mental illness or genetics, and focused on the effects of social upheaval or interaction on an individual. While much of his theory has been expanded and improved upon, the concept of social isolation or tension as a risk factor for suicide does still hold true today.

Edwin Shneidman contributed another seminal social theory of suicidality. His theory, well-articulated in The Suicidal Mind, is largely based on the idea of thwarted psychological needs and the ensuing mental anguish, a condition he describes as “psychache.”(Shneidman, 1996). The causes of “psychache” include a large variety of thwarted needs, including achievement, play, affiliation, and understanding. For Shneidman, this deep mental pain associated with these thwarted needs, in combination with the access to potentially lethal means of self-injury, can produce suicidality.

Thomas Joiner, a well-respected, prolific writer on suicide, expanded and clarified Shneidman’s concept of “psychache” to two specific kinds of psychosocial pain that contribute to suicidality. The first is thwarted belongingness, the inability to connect with and feel welcomed by others. To fully flesh out this need of belongingness and the pain its absence causes, Joiner quotes a passage from William James’s Principles of Psychology:

No more fiendish punishment could be devised, were such a thing physically possible, than that one should be turned loose in society and remain absolutely unnoticed by all the members thereof. If no one turned around when we entered, answered when we spoke, or minded what we did, but if every person we met ‘cut us dead,’ and acted as if we were non-existent things, a kind of rage and impotent despair would before long well up in us, from which the cruelest bodily torture would be a relief (Joiner, 2005a).

There is evidence in the literature on suicide that a lack of belongingness is a contributing factor in suicidal behavior, and that familial or social ties are protective against suicidality. Marital status is highly protective against suicide, especially for men. One study showed that older men with divorced or widowed status were up to five times as likely to die by suicide as their married counterparts (Schmutte, O'Connell, Weiland, Lawless, & Davidson, 2009). Joiner also notes that for the population as whole, divorce status confers a threefold increase in suicidality (Joiner, 2005). Studies also suggest that having children lowers the risk of suicide for women. One study showed that women with six children or more had 20% of the risk of death by suicide than their peers (Hoyer, 1993). During times of war or national crisis, suicide rates have historically decreased ;suicide rates during World War 2 were at record lows, both in the United States and in England (Joiner, 2005). In short, the perception of alienation and failure to belong are significant contributing factors to suicidality for Joiner—and conversely, community identity and interaction are protective against suicide.

The other major contributing psychological factor in Joiner's theory is perceived burdensomeness: the sense that one is a drain on family, friends, or the larger community. In one study, Joiner examined the language of suicide notes, and found that the sense of being a burden was a significant predictor of the lethality of the attempt (Joiner et al., 2002). Another study considered the state of patients' emotions before a suicide attempt; psychiatrists found that perceived burdensomeness was one of three variables consistently reported in the month leading up to the suicide attempt (O'Reilly R.L., Truant G.S., and Donaldson L., 1990). Finally, researchers examined suicidality in terminally ill cancer patients. They found that perceived burdensomeness was one of the two most

important risk factors for suicidality (Filiberti, 2001). Social disconnect in the form of burdensomeness appears to confer a significant risk of suicide.

Suicide Prevention: A Challenge for the Public Health Practitioner

Suicide prevention continues to be both a priority and a challenge for the public health community. In 2001, the U.S. Surgeon General issued the first National Strategy for Suicide Prevention, with an updated Strategy released in 2012. Both documents outline action items across the prevention spectrum, with attention paid to data surveillance, suicide prevention programming for a variety of populations, and program evaluation.

Before considering specific programming priorities and activities, it is worth noting the population levels at which suicide prevention programs operate, generally Universal, Selective, and Indicated populations (Goldsmith et al., 2002). Universal strategies are focused on an entire community, and are designed to influence the behavior and actions of everyone in the community. Strategies at this population level include removing barriers to care, attempting to remove the social stigma of utilizing mental health services, enacting and enforcing laws designed to restrict means (such as laws restricting gun ownership, or enacting physical barriers on bridges) and offering gatekeeper training at the community level. The World Health Organization endorses suicide prevention programming at this level, with specific interventions for higher-risk individuals (Goldsmith et al., 2002). Universal interventions offer a high participation rate, the advantage of exposing all members of a group to training/intervention efforts (not just those identified as higher-risk), and can be very cost-effective. Their disadvantages include minimal personal contact (which can be protective against

suicidality), and any emotional or cultural barriers to implementation (for example, the reluctance to talk about suicide in general).

Selective strategies are aimed at specific, at-risk subgroups in a population, and are focused on reducing suicidality in the group with the highest probability. These programs may include gatekeeper training for caretakers of at-risk adults (e.g. prison employees), directed educational campaigns, and additional training for mental health workers. To some extent, Selective programming requires the ability to effectively screen for at-risk groups within a population. One drawback of Selective programming is the reality that some of the most effective screeners, such as primary care physicians, are not adequately prepared to identify suicidality. There is some difficulty in correctly identifying suicidal behavior in patients with no previous psychiatric concerns, as well as patients with a substantive list of physical concerns in addition to their less-obvious suicidality (Chang & Tan, 2015; Raue, Ghesquiere, & Bruce, 2014; Vaszari, Bradford, Callahan O’Leary, Ben Abdallah, & Cottler, 2011). Peer gatekeepers are an additional group that can be utilized in the screening process for Selective programming; a training program like QPR can help give peer leaders the tools and confidence to assist their friends and coworkers. Overall, Selective training has the potential to be cost-effective and beneficial to populations in need of additional mental health or support services.

Indicated programming is aimed at high-risk individuals who have been identified as showing elevated risk signs for suicidality. These strategies may include case management, treatment programs, and support groups within school or community settings. One strength of this strategy is the personalized attention available to individuals receiving services. However, the availability of mental health services, including their

cost and coverage by insurance, can play a role in limiting their utilization. A number of populations, men in particular, may be reluctant to utilize services and resources, even when they are available (Mishara, Houle, & Lavoie, 2005).

The evidence base for suicide prevention programming has greatly expanded over the past several years. Currently, there are two registries for programming supported by the scientific literature. The first, the Suicide Prevention Resource Center's Best Practices Registry: Evidence Based Programs list, is targeted specifically towards suicide prevention programs. The second, SAMHSA's National Registry of Evidence-Based Practices and Programs, looks more broadly at behavioral health programs, but does include suicide-specific training. There is some overlap between the two registries, but many programs are on one, but not the other.

One of the most well-studied and well-regarded suicide prevention programs is the Air Force Suicide Prevention Program. In the 1990's, the Air Force noted that the second leading cause of death among airmen was suicide, but less than 1/3 of the individuals who died by suicide had accessed mental health services before their death (Ryan, Michael E. and Carlton, 2001). Air Force administration resolved to implement a program aimed at culture change—requiring suicide prevention training for the entire force on a regular basis, destigmatizing the mental health process, and encouraging social support for airmen in crisis. The impact was substantive—a statistically significant reduction in suicides among airmen, but also a tremendous reduction in moderate and severe domestic violence, as well as unintentional injuries (Knox et al., 2010; Knox, Litts, Talcott, Feig, & Caine, 2003). Two concerns limit the applicability of this program to the general population, however—first, the military's culture is so singular and

compliance with required orders is so high as to limit the generalizability of the program to other, more informal settings, like schools or workplaces. And second, the military's mental health screening in advance of enlistment minimizes the mental health diversity of the population somewhat, unlike their civilian counterparts.

One common approach to suicide prevention programming within a community or workplace is gatekeeper training—teaching individuals with no clinical expertise the signs of suicidal crisis, how to communicate with someone considering suicide, and detailing local and national resources. Gatekeeper training programs function as a sort of mental health triage, with the end goal of getting suicidal people into the “chain of survival” quickly (Sanddal, 2003). Gatekeeper trainings rests upon the philosophy that many in crisis will not seek professional help: “because suicide happens in families, among friends, in religious congregations and among co-workers... the person most likely to prevent you from taking your own life is someone you already know,” (Quinnett, 2007). Gatekeeper training builds on the tenets of social cognitive theory, framing learning as a dynamic and interactive cycle through a social mechanism, and recognizes that social interaction shapes current and future behavior.

One of the most common gatekeeper training programs is QPR—Question, Persuade, Refer. Developed in 1995 by Dr. Paul Quinnett, a clinical psychologist, QPR is a 1-2 hour training that requires no special training or background for participants. The cost is modest—as little as \$2 per participant in required materials—and it can be easily customized, making it attractive to a number of populations. Several gatekeeper training programs, including QPR, have been added to SAMHSA's National Registry of Evidence-Based Practices and Programs and the SPRC's Best Practices Registry,

indicating an adequate research base to support their use. Most commonly, participants in gatekeeper training programs demonstrate a gain in knowledge of suicide warning signs, improvement in gatekeeper self-efficacy, and feel more prepared to intervene if necessary. However, less is known about behavior change as a function of suicide prevention training—a gap in the literature we intend to address in some part through this research. We are also interested in examining outcomes beyond suicide and mental health that may occur as a function of suicide prevention training. Prior research on workplace suicide prevention has found a reduction in other injury outcomes (e.g., homicide, death by unintentional injury), but hasn't considered the impact on workplace injuries specifically, or the broad influence on the psychosocial space of the workplace. This project will help augment the occupational health and safety research by examining the relationship between perceptions of workplace safety and exposure to suicide prevention training.

This research project has the following aims:

Specific Aim 1: Describe the recognition and referral experiences of professional staff at a large public Midwestern university, analyzed by exposure to suicide prevention programming and volume of contact with coworkers and students.

Specific Aim 1.1: Characterize professional staff's experiences recognizing depression and suicidality among students and coworkers.

Specific Aim 1.2: Examine the role of suicide prevention programming and contact with students and coworkers on engagement with students and coworkers that appear to be experiencing depression and/or suicidality.

Specific Aim 2: Measure the difference in preparedness to respond, gatekeeper self-efficacy, gatekeeper reluctance, and familiarity with resources among professional staff at the University, by exposure to prior suicide prevention programming and a personal prior experience with suicide.

Specific Aim 2.1: Characterize preparedness to respond, gatekeeper self-efficacy, gatekeeper reluctance, and familiarity with resources at baseline, by exposure to any prior suicide prevention training/programming over the previous five years.

Specific Aim 2.2: Describe the impact of a personal prior experience with suicide on preparedness to respond, gatekeeper self-efficacy, gatekeeper reluctance, and familiarity with resources.

Specific Aim 3: Measure the difference in perception of safety culture between individuals exposed to QPR gatekeeper training and a control group.

CHAPTER 2

THE IMPACT OF CONTACT AND PRIOR TRAINING IN SUICIDE PREVENTION ON ENGAGEMENT WITH STUDENTS AND COWORKERS IN CRISIS

Introduction

Suicide is the leading cause of death by violence. In 2014, the last year for which complete data is available, almost 43,000 individuals died by suicide, making it the 10th most common cause of death across all age groups (Drapeau & McIntosh, 2015). The number of deaths by suicide have been increasing since 1999 (Centers for Disease Control and Prevention, 2013). The suicide rate now approximately 13.4 per 100,000, and over a million years of potential life were lost in 2014 to suicide (Drapeau & McIntosh, 2015).

Depression is the most common mental illness in the United States. The CDC estimates that in any given two week period, about 9% of the population 12 years of age and older is suffering from depression (2010). The same study found that the prevalence of major depression increased with age from adolescence into the middle years, with the highest rate observed among 45-64 year olds. Despite the fact that depression is so prevalent in the population, it is frequently untreated or undertreated. One study found that only about half of individuals diagnosed with major depression received *any* treatment for it, with about 20% in treatment receiving care that met the American Psychiatric Association (APA) *Practice Guidelines for the Treatment of Patients with Major Depressive Disorder* (González et al., 2011).

The relationship between depression and suicide has been well documented. At the time of death, approximately 90% of individuals who died by suicide had a mood or substance use disorder, most commonly depression (Tanney, 2000). The American Association of Suicidology estimates that two thirds of individuals who died by suicide were depressed at the time of their death. One prospective study among psychiatric outpatients found that individuals diagnosed with major depression had about three times the risk of eventually dying by suicide when compared to patients without a diagnosis of depression (Brown, G.K., Beck, A.T., Steer, R.A. and Grisham, 2000).

Both depression and suicide are significant issues of concern on college campuses. According to the National Alliance on Mental Illness (NAMI) about 25% of young adults between 18 and 24 have a diagnosable mental illness. About three quarters of all lifetime mental disorders begin by the time an individual is in the mid-twenties (Kessler, 2007). In any given year, about 80% of college students feel overwhelmed, and about 45% feel that things are hopeless – both symptoms of depression. Despite the prevalence of mental health concerns, college students are reluctant to seek services on campus: one national survey found that less than 25% of college-aged individuals with a mental disorder sought treatment in the previous year (Blanco, 2008).

The university setting allows us to examine how professional, nonclinical staff recognize and respond to apparent depression and suicidality among college students. Studies on mental health among college students have largely focused on evaluating the prevalence of mental health problems and utilization of mental health services on campus (Furr, Westefeld, McConnell, & Jenkins, 2001; Schwartz, Nissel, Eisenberg, Kay, &

Brown, 2012; Zivin, Eisenberg, Gollust, & Golberstein, 2009). Professional staff working in the college setting *outside* of the clinical environment are uniquely poised to address apparent mental health concerns among students that are unaware of the resources available to them, or unwilling to seek help on their own, but amenable to seeking services if referred.

At the same time, working within a college setting also allows us to examine recognition and response of depression and suicidality between coworkers. Workplaces are increasingly being recognized as potential intervention sites to address mental health concerns. Suicide is a particular burden for working aged individuals; suicide rates for 35-64 year olds have increased by almost 30% over the past decade, while rates for younger and older Americans have remained flat or declined slightly (Centers for Disease Control and Prevention, 2013). The updated National Strategy for Suicide Prevention specifically highlights the workplace as an appropriate intervention and evaluation site for suicide prevention programming, recognizing the value of programming at the universal level in this setting (U.S. Department of Health and Human Services, 2012). Gatekeeper training programs, like Question, Persuade, Refer, are becoming increasingly common in the workplace setting—they are designed to work within existing social networks, and require no special knowledge of mental health to participate, making them a good fit for a workplace (Quinnett, 2007).

The main objective of this study was to identify the extent to which university employees were comfortable with discussing depression and suicidality with students and coworkers. We also sought to understand whether participants felt comfortable referring

staff and students to campus resources if there were concerns about mental health status. We hypothesized that employees who had prior suicide prevention training and those who had positions with high interaction with students and/or coworkers would be more willing to engage in these suicide prevention activities

Methods

This study is nested in a larger quasi-experiment that was conducted at a large public Midwestern university with over 31,000 students and almost 23,000 staff and faculty members. The parent study evaluated the impact of Question, Persuade, Refer (QPR), a suicide prevention program, in a workplace setting. The baseline survey, taken at enrollment in the research project, was the source of information for this analysis.

Participants

The base population was the approximately 13,000 professional staff employed at the university. Two groups within this population served as sources for recruitment. First, we invited members of the human resources business meeting group to participate, which included a total of 289 staff members employed either in central human resources, or who coordinated human resource responsibilities for their department or unit. This population included participants at a variety of administrative levels within the organization. The second group of participants was recruited from the pool of 502 professional staff that had voluntarily enrolled in at least one Learning and Development course at the university. A total of 791 individuals were invited to participate from these two sources combined.

Potential participants were recruited by email, and completed four surveys: baseline (at enrollment), then one, six and twelve months later. Only the baseline surveys were used for this analysis. All surveys were conducted online through Survey Monkey. Participants provided demographic information at baseline. They also answered questions measuring knowledge about suicide/depression, attitudes about suicide/depression, familiarity with resources for depressed/suicidal individuals, and experiences identifying and responding to individuals in crisis at each time point.

The initial recruitment pool was comprised entirely of professional staff, although faculty members and students were not restricted from participation if they had a primary appointment as university staff. Participants were not required to be full-time employees. Individuals who had previously attended QPR gatekeeper training were not eligible for participation in the parent study and therefore are not included in this analysis. At baseline, 15 individuals were excluded for prior participation in QPR training. Other types of suicide prevention training were not excluded—participants self-reported training status at baseline, and prior suicide prevention training was included as a covariate in this analysis. Of the 791 individuals invited to participate, 208 individuals indicated a willingness to enroll in the study and responded to at least one question in this baseline survey, a response rate of approximately 26%.

Outcome Variables

There were six specific outcomes that we examined:

- recognizing apparent depression/distressed mood (example question: “how many times have you thought a student’s behavior might indicate s/he was very distressed or depressed?”)

- recognizing apparent suicidality (example question: “how many times have you thought an employee/coworker’s behavior might indicate s/he was considering suicide?”)
- asking a potentially depressed/distressed person about their mood (example question: “how many times have you asked a student about his/her distressed or depressed mood?”)
- asking a potentially suicidal person about their mood (example question: “how many times have you asked a coworker/employee whether s/he was considering suicide?”)
- referring a potentially depressed/distressed person to resources (example question: “how many coworkers/employees did you personally refer to appropriate resources because you were concerned that they might be depressed?”)
- referring a potentially suicidal person to resources (example question: “how many students did you personally refer to appropriate resources because you were concerned that they were suicidal?”)

For each of the outcomes above, we looked at two relationships: staff and student, and coworker/coworker. Although the survey asked participants for the number of times each situation occurred since the employee had been at the university, we recoded the outcome variables to binary outcomes (yes, ever; no, never), to account for the dispersion of the data. Some of the outcomes were very common; others quite rare. Recoding to a binary variable allowed us to examine all outcomes of interest with a similar analytic approach.

Exposure Variables

We examined three exposures of interest in this research study. The first was self-reported contact with students on a weekly basis; this was categorized as high contact (engaging with 11 or more students per week), some contact (engaging with 5-10 students per week), and low contact (engaging with less than five students per week). Next, we assessed self-reported contact with college employees on a weekly basis; this was categorized as high contact (engaging with 21 or more employees per week) and low contact (engaging with 20 or fewer employees per week). We included contact in our

models to assess whether reports of engaging with individuals in crisis were simply associated with high levels of general engagement with students and staff.

Finally, we considered participation in a suicide prevention training/curriculum within the previous 5 years. This was coded as a binary variable—either yes, any form of training (including talks, lectures, receiving brochures or informational material), or no, no training/programming reported. Including training as a variable allowed us to assess whether there is a persistent effect of exposure to any form of suicide prevention training or programming. This catch-all category, while imprecise, does reflect the nature of suicide prevention programming on a college campus—individuals are often exposed to multiple formats and content depths on any given issue related to student or employee health and wellness. Participants may engage in both mandatory and optional training of varying lengths and intensities on a topic. This may be particularly true on issues like suicide or sexual violence, which frequently prompt a campus-wide engagement after an incident.

Covariates

We examined a variety of demographic variables: gender, race/ethnicity (recoded as white and other races/ethnicities, due to the prevalence of white participants in this study), age (coded as a categorical variable), and years of employment at the University (coded as a categorical variable). The demographic covariates were included to account for expected differences in peer support and health communication, and reflect demographics information collected by other suicide prevention research studies (Tompkins, Witt, & Abraibesh, 2010; Wyman et al., 2008).

Statistical Analysis

Among our sample of university employees, we examined the frequency of their reported recognition, response, and referral for depression and suicidality for both students and staff. We ran descriptive statistics on the demographic variables, as well as frequencies of the exposures and outcomes of interest. We used multivariate logistic regression to examine our outcomes, which were run separately for student outcomes and employee outcomes. Each outcome analysis included three models: contact as the primary exposure of interest, training as the primary exposure of interest, and a model that included both exposures. Each of the models was adjusted for age, gender, years of employment at the University, and race/ethnicity. All statistical analysis was performed in STATA version 13.0.

Results

Students-Staff Contact

A total of 208 participants were included in this research study (Table 2.1). The participants were mostly female (85.6%) and white (94%). About 2/3 of participants had been employed by the University for 10 years or more. Approximately 65% of participants had contact with an average of 21 or more employees per week, and approximately 31% had contact with 11 or more students per week. Just under a third had some prior suicide prevention training in the past five years.

The recognition of depression/distressed mood in students was common among professional staff—over 40% thought that a student’s mood indicated depression (Table 1.2). Response to a depressed or distressed mood remained high—almost 30% had asked

a student about a distressed or depressed mood at least once, and about 25% referred a depressed or distressed student to resources on campus.

The recognition of potential suicidality among students was fairly common—about 22% thought a student’s behavior might indicate that he/she was considering suicide. However, professional staff were much less likely to engage with students in conversations about apparent suicidality, as compared to engaging with students in conversations about apparent depression. About 6% asked a student if they were considering suicide, and about 10% referred them to appropriate resources because of their apparent suicidality.

In the full model (contact and training), high contact with students was significantly associated with a variety of measures (Table 2.4). Contact was associated with recognizing depression (OR: 2.77, 95%CI 1.87 to 4.13), asking a student about an apparent depressed or distressed mood (OR: 2.09, 95%CI 1.41 to 3.11), and referring them to resources (OR: 2.46, 95%CI 1.58 to 3.83). High contact with students was significantly associated with recognizing suicidality (OR: 3.28, 95%CI 1.97 to 5.48) and referring a student to resources (OR: 2.15, 95% 1.18 to 3.90), but marginally associated with asking a suicidal student about their mental state (OR: 2.23, 95%CI .99 to 5.04).

Prior participation in some form of suicide prevention training or programming was significantly associated with recognizing a depressed student in the full model (OR: 2.47, 95%CI 1.23 to 4.93) and with referring a depressed or distressed student to appropriate resources (OR: 4.42, 95%CI 2.06 to 9.48). Training was not statistically associated with asking a depressed or distressed student about their mood (OR: 1.74, 95%CI .86 to 3.52). Suicide prevention training or programming was associated with

recognizing a suicidal student (OR: 6.32, 95%CI 2.71 to 14.77), asking a potentially suicidal student about their mood (OR: 32.19, 95%CI 4.49 to 230.58), and referring a potentially suicidal student to appropriate resources (OR: 5.36, 95%CI 1.96 to 14.69).

Coworker-Coworker Contact

Almost 80% of participants reported that at some point they had thought a coworker was depressed or distressed, and about 70% reported asking a coworker about their depressed or distressed mood (Table 2.4). Less than half (46.5%) of participants reported referring a potentially depressed coworker to resources. Participants were much less likely to report recognizing apparent suicidality—about 35% indicated that at some point they had thought a coworker was contemplating suicide. They were also much less likely to ask a coworker if they were considering suicide (10.6%), or to refer a potentially suicidal coworker to resources (18.4%)

High contact with coworkers was statistically associated with asking a depressed coworker about their mood (OR: 2.47, 95%CI 1.25 to 4.87), but was not associated with identifying a coworker's distressed or depressed mood (OR: 1.97, 95%CI .92 to 4.21) or referring a depressed coworker to resources (OR: 1.29, 95%CI .69, 2.41) (Table 5).

Contact was also of variable importance in responding to a perceived suicidal coworker: it was not significantly associated with recognizing suicidality in a coworker (OR: 1.75, 95%CI .89 to 3.44) or asking a suicidal coworker about their emotional state (OR: 2.07, 95%CI .63 to 6.73), but it was associated with an increase in referring a suicidal coworker to resources (OR: 2.93, 95% CI 1.11 to 7.69).

Suicide prevention training was generally associated with increased recognition and response of apparent depression and suicidal crisis among coworkers (Table 5). Participating in some sort of training or programming within the previous 5 years was associated with identifying a distressed or depressed mood (OR: 5.55, 95%CI 1.60 to 19.27) and referring a depressed coworker to appropriate resources (OR: 2.80, 95%CI 1.44 to 5.11). Suicide prevention training was marginally associated with an increase in asking coworkers about their distressed or depressed mood (OR: 2.21, 95%CI .96 to 5.11). Training was consistently associated with an increased ability to identify and react to apparent suicidal crisis in a coworker. Participants who reported some suicide prevention training or programming showed higher rates of identifying apparent suicidality (OR: 2.27, 95%CI 1.17, 4.42), asking a coworker about their suicidal mood (OR: 6.25, 95%CI 2.34, 16.71) and referring a suicidal coworker to resources (OR: 3.45, 95%CI 1.59, 7.48).

Discussion

Professional staff had low reports of discussing suicide issues with students—while about 22% of the employees in our survey had thought at least once that a student's behavior indicated they were considering suicide, about 6% had actually *asked* a student whether or not they were considering suicide. Prior studies have shown that many college students in crisis are reluctant to seek help (Czyz, Horwitz, Eisenberg, Kramer, & King, 2013; Golberstein, Eisenberg, & Gollust, 2009; National Alliance on Mental Illness, 2012); if professional staff feel enabled and prepared, they may fill an essential role in referring students to appropriate services. We found smaller differences between recognizing students who might be depressed (41.3%) and responding to them (29.5%),

which may suggest greater willingness to discuss depression than suicide. There is a pervasive myth that mentioning suicide—indeed, even saying the word—can induce a person to consider suicide, despite the evidence to the contrary. The reluctance of professional staff to engage with students on this issue may be related to that concern.

Both contact and training were generally statistically significant in their associations with engagement with students about mental health concerns. More contact with students may provide a breadth of emotional experiences to the staff person, so that they are more able to identify potentially distressed students, and are more comfortable engaging with those students. Alternatively, professional staff positions with high student contact may draw individuals with engaging personalities—natural gatekeepers, to put it another way. This was perhaps most evident when considering the relationship between contact, training, and asking a student about their depressed mood; there was no statistical link between training and responding to apparent depression, while contact remained significant. This could signify that no training is necessary to equip professional staff for casual conversations, but that suicide prevention training is helpful for the more difficult questions (like asking a student about suicide). One study of college student suicide found that students recommended creating a more open environment around the topic of suicide prevention as one strategy on campus (Westefeld et al., 2005). Again, professional staff outside of the clinical setting are one population that can normalize conversations about mental health promotion and suicide prevention.

The University setting also provides the opportunity to examine the nature of communication about mental health crises between coworkers. For the past few years, the highest suicide rates are among individuals in the middle years (McIntosh, 2014).

Informal social networks can often provide the first indication that an individual is in distress—the theoretical underpinning of many gatekeeper training programs like QPR (Quinnett, 2007). Our study validates that employees without a professional obligation to identify and treat mental illness are still engaging in conversations about it.

The prevalence of apparent depression in the workplace is hardly surprising, given the rates of depression in the population in general; however, it is of note that over 1/3 of participants had suspected a coworker of considering suicide—but less than 11% had asked the coworker about their mental state. Again, we suspect that a conversation about suicide is a particularly difficult one to have, and suicide prevention training of any kind helps make that conversation easier. This opinion is supported by the fact that in the final model, training was significant for all outcomes except asking a coworker about their depressed/distressed mood. It is also supported by the literature—suicide prevention training programs generally improve the efficacy of participants (Keller et al., 2009; Wyman et al., 2008).

This study has several limitations. The response rate for the baseline survey was only 26%. The pool of intervention participants for the larger quasi-experiment was selected in part for their motivation and willingness to participate in the QPR curriculum, and we recruited similarly motivated control participants. This group as a whole may be more engaged on campus than typical professional staff, and as such, may be more likely to recognize and respond to mental health crises among students and workplace peers. On the other hand, because the majority (about 70%) reported no suicide prevention training/programming of any kind, we feel that this group is a good representation of the nonclinical staff in a University setting. We also realize that the cross-sectional nature of

this study doesn't allow us to examine whether suicide prevention training changes intervention behaviors; however, future studies from the larger QPR project will address the question of behavior change. We recognize that the category of training/programming includes a variety of modalities and dosages, which limits the generalizability of our results. Finally, we recognize the inherent limitations in self-reporting, particularly when asking about experiences that occurred several years prior.

Our study also has a number of strengths. Much of the literature on college student mental health has been from the perspective of the student or the counselors on campus; our study is unique by examining the experiences of professional staff in a University setting who have no expectation of providing mental health services, but may still encounter students in crisis. This naturalistic study is made even more innovative by including the recognition and response experiences of staff when engaging with workplace peers in mental distress.

This study indicates that prior suicide prevention training significantly increases the likelihood that nonclinical staff will recognize and respond to a mental health crisis and refer an individual to appropriate resources, regardless of whether the employee is engaging with a coworker or with a student. Even with the limitations of this study, this presents an opportunity for the direction of suicide prevention. Future research on whether suicide prevention programming actually changes intervention behaviors could be beneficial, as well as examining the persistence in behavior change. Likewise, little is known about the comparative effectiveness of available suicide prevention training programs—while there is an evidence base for several training modules, there is insufficient information for a college campus weighing the respective costs and benefits

of a variety of programs, with respect to recognition and response to an apparent crisis. With such wide differences in training burden and cost per participant, better information on the efficacy of these training programs is essential. Finally, it is unclear whether other training programs that teach pro-social behaviors, such as bystander training programs for sexual violence prevention, might also improve engagement with peers in crisis. Because college campuses often struggle with funding health and wellness programming, identifying whether violence prevention interventions affect multiple adverse outcomes is a natural next step.

This study also demonstrates that professional staff who self-report high levels of student contact on a weekly basis are more likely to intervene than their professional peers who report less contact, although the mechanism for this is still unclear. With many college students uncertain about seeking assistance for a mental health crisis, these natural gatekeepers may provide to be an essential link in connecting students to services. More research is needed on this topic.

Gender	Frequency	Percent
Female	172	85.57%
Male	29	14.43%
Age	Frequency	Percent
30—39	45	22.39%
40—49	58	28.86%
50—59	62	30.85%
60+	26	12.94%
Race/Ethnicity	Frequency	Percent
White	189	94.03%
Other	12	5.97%
Years of Employment at the University	Frequency	Percent
Less than 5 years	40	19.23%
5-10 years	33	15.87%
At least 10, less than 20	53	25.48%
At least 20, less than 25	35	16.83%
25 years or more	47	22.60%
Employee Contact	Frequency	Percent
Contact with 20 or fewer employees per week)	72	34.95%
High (Contact with 21+ employees per week)	134	65.05%
Student Contact	Frequency	Percent
Low (Contact with fewer than 5 students per week)	89	43.20%
Medium (5-10 per week)	53	25.73%
High (11+ per week)	64	31.07%
Suicide Prevention Training/Programming	Frequency	Percent
No training reported in the past 5 years	145	69.71%
Some training/programming in the past 5 years	63	30.29%

Table 2.1 Demographics

Note: frequency counts do not always sum to total because of missing data.

Recognizing and Responding to a Crisis: Students	Never/none	At least one/once
How many times have you thought a student's behavior might indicate s/he was very distressed or depressed?	118 (58.71%)	83 (41.29%)
How many times have you asked a student about his/her distressed or depressed mood?	141 (70.50%)	59 (29.50%)
How many students did you personally refer to resources because you were concerned they might be depressed?	151 (75.50%)	49 (24.50%)
How many times have you thought a student's behavior might indicate s/he was considering suicide?	157 (78.11%)	44 (21.89%)
How many times have you asked a student whether s/he was considering suicide?	189 (94.03%)	12 (5.97%)
How many students did you personally refer to appropriate resources because you were concerned they might be suicidal?	181 (89.60%)	21 (10.40%)

Table 2.2 Asking Students about a Mental Health Crisis

Note: Participants were asked to think about their experiences at the college, and count how many times they did the above: never, one time, twice, three times, or four or more times. They were also asked to answer whether this had occurred in the past year. Responses were recoded to yes/ever or no/never.

Recognizing and Responding to a Crisis: Coworkers	Never/none	At least one/once
How many times have you thought an employee/coworker's behavior might indicate s/he was very distressed or depressed?	41 (20.81%)	156 (79.19%)
How many times have you asked a coworker/employee about his/her distressed or depressed mood?	59 (30.41%)	135 (69.59%)
How many employees/coworkers did you personally refer to resources because you were concerned they might be depressed?	107 (53.50%)	93 (46.50%)
How many times have you thought an employee/coworker's behavior might indicate s/he was considering suicide?	128 (64.32%)	71 (35.68%)
How many times have you asked a coworker/employee whether s/he was considering suicide?	178 (89.45%)	21 (10.55%)
How many employees/coworkers did you personally refer to appropriate resources because you were concerned they might be suicidal?	164 (81.59%)	37 (18.41%)

Table 2.3 Asking Employees about a Mental Health Crisis

Note: Participants were asked to think about their experiences at the college, and count how many times they did the above: never, one time, twice, three times, or four or more times. They were also asked to answer whether this had occurred in the past year. Responses were recoded to yes/ever or no/never.

Recognizing and Responding to a Crisis: Students				
	Model 1: Contact*	Model 2: Training	Model 3: Contact and Training	
	Contact OR	Training OR	Contact OR	Training OR
Recognizing a depressed student	2.64 (95% CI: 1.80, 3.88, p=.000)	1.91 (95%CI: 1.02, 3.56, p=.042)	2.77 (95% CI: 1.87, 4.13, p=.000)	2.47 (95%CI: 1.23, 4.93, p=.011)
Asking a depressed student about their mood	2.04 (95%CI: 1.39, 3.01, p=.00)	1.54 (95%CI: .79, 3.00, p=.203)	2.09 (95%CI: 1.41, 3.11, p=.000)	1.74 (95%CI: .86, 3.52, p=.123)
Referring a depressed student to resources	2.19 (95%CI: 1.45, 3.31, p=.000)	3.42 (95%CI: 1.71, 6.87, p=.001)	2.46 (95%CI: 1.58, 3.83, p=.000)	4.42 (95%CI: 2.06, 9.48p=.000)
Recognizing a suicidal student	2.75 (95% CI: 1.74, 4.35, p=.000)	4.36 (95%CI: 2.11, 9.02, p=.000)	3.28 (95%CI: 1.97, 5.48, p=.000)	6.32 (95%CI: 2.71, 14.77p=.000)
Asking a suicidal student about their mood	1.89 (95%CI: .90, 3.97, p=.092)	21.22 (95%CI: 3.76, 119.86, p=.001)	2.23 (95%CI: .99, 5.04, p=.053)	32.19 (95%CI: 4.49, 230.58, p=.001)
Referring a suicidal student to resources	1.94 (95%CI: 1.11, 3.40, p=.021)	4.60 (95%CI: 1.76, 12.03, p=.002)	2.15 (9%CI: 1.18, 3.90, p=.012)	5.36 (95%CI: 1.96, 14.69, p=.001)

Table 2.4 The Impact of Contact and Training on Engagement with Students

*all models were adjusted for age, gender, years of employment at the University, and race/ethnicity.

Note: Participants were asked to think about their experiences at the college, and count how many times they did the above: never, one time, twice, three times, or four or more times. They were also asked to answer whether this had occurred in the past year. Responses were recoded to yes/ever or no/never, with no/never serving as the reference group.

Recognizing and Responding to a Crisis: Employees				
	Model 1: Contact*	Model 2: Training	Model 3: Contact and Training	
	Contact OR	Training OR	Contact OR	Training OR
Recognizing a depressed coworker	2.23 (95% CI: 1.06, 4.68, p=.034)	3.57 (95% CI: 1.30, 9.84, p=.013)	1.97 (95% CI: .92, 4.21, p=.082)	5.55 (95% CI: 1.60, 19.27, p=.007)
Asking a depressed coworker about their mood	2.65 (95% CI: 1.36, 5.20, p=.004)	2.26 (95% CI: 1.02, 4.98, p=.044)	2.47 (95% CI: 1.25, 4.87, p=.009)	2.21 (95% CI: .96, 5.11, p=.063)
Referring a depressed coworker to resources	1.46 (95% CI: .79, 2.69, p=.222)	2.62 (95% CI: 1.37, 5.00, p=.003)	1.29 (95% CI: .69, 2.41, p=.433)	2.80 (95% CI: 1.44, 5.46, p=.003)
Recognizing a suicidal coworker	1.93 (95% CI: .96, 3.74, p=.052)	2.28 (95% CI: 1.19, 4.37, p=.013)	1.75 (95% CI: .89, 3.44, p=.103)	2.27 (95% CI: 1.17, 4.42, p=.016)
Asking a suicidal coworker about their mood	2.60 (95% CI: .83, 8.13, p=.101)	6.43 (95% CI: 2.43, 17.03, p=.000)	2.07 (95% CI: .63, 6.73, p=.228)	6.25 (95% CI: 2.34, 16.71, p=.000)
Referring a suicidal coworker to resources	3.45 (95% CI: 1.34, 8.88, p=.010)	3.64 (95% CI: 1.72, 7.73, p=.001)	2.93 (95% CI: 1.11, 7.69, p=.029)	3.45 (95% CI: 1.59, 7.48, p=.002)

Table 2.5 The Impact of Contact and Training on Engagement with Employees

Note: ONLY females and white/Caucasians asked coworkers about apparently suicidality. The model above does not include race or gender for asking a coworker about a suicidal mood.

Participants were asked to think about their experiences at the college, and count how many times they did the above: never, one time, twice, three times, or four or more times. They were also asked to answer whether this had occurred in the past year. Responses were recoded to yes/ever or no/never, with no/never serving as the reference group.

CHAPTER 3

THE IMPACT OF TRAINING AND A PERSONAL PRIOR EXPERIENCE WITH SUICIDE ON GATEKEEPER CONSTRUCTS

Introduction

Suicide is the tenth leading cause of death in the United States—over 40,000 people died by suicide in 2014 (Mcintosh & Drapeau, 2015). Suicide rates have been steadily increasing over the past decade, after a long-term decrease in rates in the 1980's and 90's ("American Foundation for Suicide Prevention - Facts and Figures," 2014). Suicide attempts are far more difficult to quantify, but a SAMHSA survey in 2013 found that over 1.3 million individuals attempted suicide in the previous year (*Results from the 2012 National Survey on Drug Use and Health: Mental Health Findings*, 2013). About 800,000 individuals seek medical treatment in emergency rooms for self-inflicted injuries annually; this does not include self-inflicted injuries of lesser severity that don't require emergency medical intervention (National Hospital Ambulatory Medical Care Survey, 2010).

While the study of suicide has largely focused on the decedent—e.g., identifying risk factors, assessing whether there was a prior diagnosis or symptoms of a mental illness, etc.—the literature reflects a greater awareness of and interest in the impact on those left behind after a suicide, or affected by a suicide attempt (Aguirre & Slater, 2010; Ali, 2015; Burke et al., 2010; Feigelman, Jordan, & Gorman, 2009; Hibberd, Elwood, & Galovski, 2010). The term suicide “survivor” to describe the friends and loved ones has been in favor since Edwin Shneidman, the eminent suicidologist, coined the use of the

term “survivor-victims” to describe the support of those impacted by a suicide death. Generally, the word victim is no longer used in conjunction with survivors. The phrase “bereaved by suicide” is another common term to describe those impacted by a suicide death. Cerel et. al indicate that the preference for the term “survivor” is in part a response to the death itself: “some have expressed a preference for this term because it implies the concept of surviving the loss and continuing to live one’s life, in some cases finding meaning in the loss, rather than merely being victimized or identified by it,” (Cerel, McIntosh, Neimeyer, Maple, & Marshall, 2014).

In addition to the discussion around what to call those impacted by suicide and suicidality, there is some confusion about the nature of suicide survivorship as a definition and specifically who it applies to. Currently, it is presumed that a suicide survivor is someone who has lost someone to suicide; however, a recent article in *Suicide and Life-Threatening Behavior* proposed a continuum of suicide survivorship, with people exposed to a suicide at one extreme and individuals struggling with long-term bereavement after a suicide death at the other (Cerel et al., 2014). There is still some uncertainty about the inclusion of those who survive suicide attempts. The American Association of Suicidology has included *attempt* survivors as a separate category in their survivor resources, but this language is meant to reflect the inclusion of those who have themselves attempted suicide, rather than providing support for the friends and family of those who have attempted suicide.

As part of the study of those impacted by suicidality, there has also been some attempt at quantifying the number of individuals affected by a single suicide. Edwin Shneidman posited that for each death by suicide, 6 individuals are deeply affected

(Shneidman, 1973). Another study attempting to quantify the number of individuals impacted by a suicide found that individuals who died by suicide had daily contact with between 4 and 19 individuals and weekly contact with between 10 and 26 individuals (Berman, 2011). Even a conservative blend of these estimates is an increase over Shneidman's original conjecture about the number of people impacted by a suicide. To our knowledge there has not been a similar study estimating the number of individuals impacted by a suicide attempt, but it's reasonable to assume that it deeply affects a similar number of people as a completed suicide—this is especially true for individuals who make multiple attempts, and their extended social network. Our study seeks to examine whether a personal prior experience with suicidality in any form changes an individual's ability to act as a resource to others in mental distress.

Evaluations of suicide prevention strategies have found them to generally increase knowledge of risk and protective factors related to suicide among participants (Reis et al., 2007). More specifically, prior evaluations of gatekeeper training programs demonstrate an improvement in attitudes about the inevitability of suicide and improved self-efficacy regarding engagement with suicidal people change attitudes about the inevitability/preventability of suicide, and improve self-efficacy related to engaging with suicidal individuals (Cross, Matthieu, Lezine, & Knox, 2010; Keller et al., 2009; Tompkins & Witt, 2009; Wyman et al., 2008). However, few, if any, evaluations have examined the heterogeneity of effects on different individuals. Previous experiences with suicide, which research has found to be prevalent in the population given the number of suicides, suicide attempts, and the number of survivors affected by these events, may be a strong influential factor on readiness to engage in training, baseline knowledge about

suicide and available resources, and ultimately the effects of training programs. However, the direction of these effects is not known. For example, a survivor who received strong support and education about survivorship may be more willing to engage in training, be more familiar with resources, and feel more confident in engaging in gatekeeper behavior. A survivor who is still processing or bereaving an event, however, may find gatekeeper training programs to be painful and challenging. The objectives of this study are twofold: first, to identify prior survivorship experiences among an employee population prior to gatekeeper training, and second, to identify if a personal prior experience with suicidality influences readiness to engage in training, self-efficacy, confidence, and reluctance to act as a gatekeeper.

Methods

This study was nested in a larger evaluation of Question, Persuade, Refer (QPR) at a large public Midwestern university. Intervention participants completed a baseline survey at enrollment, then completed follow up surveys at 1 month, 6 months, and 12 months post-training. Control participants completed the same surveys at the same intervals without completing QPR training. This analysis uses only the baseline data; 208 participants answered at least one question on the baseline survey.

Participants

The base population was the approximately 13,000 professional staff employed at the university. Two groups within this population served as sources for recruitment. First, we invited members of the human resources business meeting group to participate, which included a total of 289 staff members employed either in central human resources, or who

coordinated human resource responsibilities for their department or unit. This population included participants at a variety of administrative levels within the organization. The second group of participants was recruited from the pool of 502 professional staff that had voluntarily enrolled in at least one Learning and Development course at the university. A total of 791 individuals were invited to participate from these two sources combined.

Potential participants were recruited by a single email message, sent by Human Resources staff, inviting them to participate in a research study on suicide prevention. Intervention participants were informed that QPR training would be included as part of the study. Surveys were conducted online through Survey Monkey. Participants provided demographic information at baseline. They also answered questions measuring knowledge about suicide/depression, attitudes about suicide/depression, familiarity with resources for depressed/suicidal individuals, and experiences identifying and responding to individuals in crisis at each time point.

The initial recruitment pool was comprised entirely of professional staff, although faculty members and students were not restricted from participation if they had a primary appointment as university staff (for example, lecturers have a primary human resources appointment as staff). Participants were not required to be full-time employees. Individuals who had previously attended QPR gatekeeper training were not eligible for participation in the parent study and therefore are not included in this analysis; at baseline, 15 individuals were excluded for prior participation in QPR training. Other types of suicide prevention training were not excluded; participants self-reported training status at baseline, and suicide prevention training is one of our primary exposures. Of the

791 individuals invited to participate, 208 individuals indicated a willingness to enroll in the study and responded to at least one question in this baseline survey, a response rate of approximately 26%.

Exposure Variables

In order to examine the effects of survivorship and prior informal training, we examined two exposures of interest. First, we asked participants if they had participated in any suicide prevention training or programming in the previous five years; exposure to a lecture, informational materials, or a training program were all examples of the types of training or programming. Individuals with specific training in QPR were excluded from participation since the overall study's objective was to evaluate QPR. We included prior training/programming as a previous study from this research project found a significant association between participation in any suicide prevention training and experiences engaging with individuals in crisis.

Our second exposure of interest was a self-reported personal prior experience with suicide. At baseline, participants were asked if they had a personal experience with suicide that they wanted to share in an open-ended text box. Any affirmative answer, whether related to the participant or an acquaintance of the participant, and regardless of the outcome (suicidal thoughts, suicide attempt, or completed suicide) was included in this analysis. Negative text answers (e.g., "not at this time") were coded as a negative response (no exposure).

Outcome Variables

To examine the influence of prior suicide experience on readiness for QPR training, we examined four constructs: familiarity with resources (example: “how familiar are you with the reporting protocol for a University student who is suicidal?”), preparedness to respond (example: “how prepared to respond to a suicidal student do you feel?”), gatekeeper self-efficacy (example: “a suicide prevention program sends the message that suicide prevention is everyone’s responsibility”) and gatekeeper reluctance (“I am too busy to participate in suicide prevention activities”). Each construct was measured on a scale of 1-7, with 1 representing a highly negative answer and 7 representing a highly positive answer, and each answer within each construct was added to give a construct sum total. Within gatekeeper reluctance a lower score was actually indicative of a positive behavioral outcome—lower reluctance to act. We reverse coded this result so that all constructs were presented in the same direction. There were eighteen questions spread across the four gatekeeper constructs.

Covariates

We examined a variety of demographic variables: gender, race/ethnicity (recoded as white and other races/ethnicities, due to the prevalence of white participants in this study), age (coded as a categorical variable) and years of employment at the university (coded as a categorical variable). The demographic covariates were included to account for expected differences in peer support and health communication, and reflect demographics information collected by other suicide prevention research studies (Tompkins et al., 2010; Wyman et al., 2008).

We also included categorical variables to describe the volume of contact with students and employees during a typical week. Contact with students on a weekly basis was categorized as high contact (engaging with 11 or more students per week), some contact (engaging with 5-10 students per week), and low contact (engaging with less than five students per week). Engagement with colleagues was categorized as high contact (engaging with 21 or more employees per week) and low contact (engaging with 20 or fewer employees per week). We included contact as a covariate because we considered that willingness to act as a gatekeeper might simply be a function of high contact with students and staff. High contact with students and staff was associated with an increased experience engaging with individuals in crisis in a previous study from this research project.

Statistical Analysis

We first performed descriptive analyses on the data to examine distributions. We also performed chi square tests to identify relationships between a personal prior experience with suicide and any suicide prevention training to assess whether there was an association between the two exposures of interest. For each outcome gatekeeper construct, we generated a sum variable of all the questions (ranging from 4-10 questions, depending on the construct). We then recoded each sum variable into a binary variable, coded negative/neutral (scores 1—4 on the Likert scale) and positive (5—7). Finally, we performed multinomial logistic regression on each construct separately, running three models: one model with exposure to any suicide prevention training, one model with exposure to a personal prior experience with suicide, and one model with both exposures, reported below. In addition to the exposures of interest and the four gatekeeper outcomes,

we considered a variety of covariates (gender, age, race, years of service to the university, any previous suicide prevention training, contact with employees per week, and contact with students per week). All analysis was performed in STATA 13.0.

Results

208 participants were included in this research study (Table 1). The participants were mostly female (85.6%) and white (94%). Almost 2/3 of participants had been employed by the university for 10 years or more. Approximately 65% of participants had contact with an average of 21 or more employees per week, and about 30% reported contact with 11 or more students per week. Just under a third had some prior suicide prevention training in the past five years.

Participants largely reported negative or neutral responses to the four gatekeeper constructs (Table 3.2). About 22% reported positively to their familiarity with resources for individuals in crisis, about 23% reported positively that they felt prepared to engage with an individual in crisis, almost 20% reported positive self-efficacy regarding gatekeeper behaviors. About 13% reported low levels of gatekeeper reluctance—indicating a willingness to engage with individuals in crisis. We also examined the association between a personal prior experience with suicide and exposure to any form of suicide prevention programming or training; the association was statistically significant ($\chi^2=5.45$, $p=.020$), indicating that those with prior experience were more likely to have had prior training/programming of some kind.

In our analysis we considered both exposures of interest: any prior suicide prevention training, and a self-reported prior experience with suicide (Table 3.3). Prior

suicide prevention training was highly significant in three of the four outcomes: preparedness to respond (OR: 4.09, 95% CI 1.93, 8.64, $p=.000$), familiarity with resources (OR: 9.44, 95% CI 4.10, 21.74, $p=.000$), and gatekeeper self-efficacy (OR: 4.52, 95% CI 1.51, 13.62, $p=.007$). However, suicide prevention training was not significantly associated with a difference in gatekeeper reluctance (OR: 1.07, 95% CI .38, 2.97, $p=.899$).

A personal prior experience with suicide was not associated with a difference in the gatekeeper constructs of interest; however, the association with gatekeeper reluctance did approach statistical significance (OR: 3.78, 95% CI .84, 17.00, $p=.083$).

Discussion

Several studies have indicated that the friends and family members of an individual who has died by suicide are themselves at greater risk for suicide, even after controlling for depression or other mental illness. Less is understood about the deleterious effects of suicide attempts on loved ones; however, one research study found that a mother's suicide attempt was associated with a fivefold increase in suicide attempts among her offspring (Lieb, Bronisch, Höfler, Schreier, & Wittchen, 2005). There has been, to the best of our understanding, no research conducted on the effect of suicide attempts or completions on an associated individual's response to future suicidality. Likewise, we are unaware of any research examining how someone who has personally survived a suicide attempt will respond when engaging with suicidal individual at a later time.

Our study found an association between a personal prior experience with suicide and engaging in suicide prevention programming/training—suggesting that suicide survivors might be more willing to engage in programming, and as such, might be an important target population for training opportunities. Individuals with a personal prior experience also exhibited lower levels of gatekeeper reluctance—a construct that was not affected by suicide prevention training or programming. In short, individuals with a personal prior experience with suicide who have received some training in suicide prevention might be the most empowered and informed gatekeepers, and the least likely to feel reluctance in the face of crisis, or to accept suicide as an inevitable outcome.

This study does have a number of limitations. First, both exposures of interest—prior suicide prevention training/programming and a personal prior experience with suicide—were self-reported. Participants may have failed to recall all exposure to suicide prevention programming, especially because our question included a variety of modalities, like receiving a pamphlet or card, that are less intensive. Second, our measure of exposure to suicide prevention programming/training also included the option for personal prior experience with suicide. A chi square of the association between the two found an association, which may indicate that individuals with a personal prior experience of suicide—regardless of the outcome, or whether the incident involved the research participant, or their loved one—are more likely to engage in suicide prevention training/programming. Next, we asked participants about all programming/ training in the previous five years; without specifying the time since exposure, we might have overstated the persistence of a training effect. Also, because participants were allowed to check more than one training modality, our exposure was coded as any/none, and we are

unable to identify which types of programming or experiences were effective in changing gatekeeper behaviors. Finally, the cross-sectional nature of this study does not allow for the examining of a modifying effect on a specific curriculum or training experience.

Our study does has a number of strengths. The university setting, and in particular the study of professional staff, provides a unique opportunity to ask about both peer relationships in the workplace and engagement with students. Most research regarding mental health on campus has focused exclusively on the student perspective—our study is unique in targeting individuals who have no professional expectation of providing crisis management services to either students or staff, but may still engage with individuals in crisis.

Several avenues of future research are suggested by these findings. First, and most importantly, future studies examining the potential effect modification of a personal experience with suicide on gatekeeper constructs before and after QPR training could prove fruitful. Our research found no association with any of the constructs, but a statistical tendency towards lower reluctance among individuals with a personal prior experience with suicide. We are curious about whether this tendency might prove statistically significant in a population that has been more formally trained in suicide prevention and gatekeeper techniques. We are also interested in examining the statistical impact of additional, more formalized suicide prevention training on those who have been exposed to some previous suicide prevention programming. There is limited research examining the long-term impact of suicide prevention training, and it is conflicting; one study found that skills acquired in suicide prevention training waned at 6 months post-training (Keller et al., 2009). Another study found gatekeeper skills among

the trained participants to be persistent enough that refresher training was not necessary (Wyman et al., 2008). Future research assessing the combination of training modalities, or comparing the durability of formal versus informal suicide prevention programs might help organizations select and prioritize suicide prevention curricula.

Gender	Frequency	Percent
Female	172	85.57%
Male	29	14.43%
Age		
30—39	45	22.39%
40—49	58	28.86%
50—59	62	30.85%
60+	26	12.94%
Race/Ethnicity		
White	189	94.03%
Other	12	5.97%
Years of Employment at the University		
Less than 5 years	40	19.23%
5-10 years	33	15.87%
At least 10, less than 20	53	25.48%
At least 20, less than 25	35	16.83%
25 years or more	47	22.60%
Student Contact		
Low (Contact with fewer than 5 students per week)	89	43.20%
Medium (5-10 per week)	53	25.73%
High (11+ per week)	64	31.07%
Employee Contact		
Low (Contact with 20 or fewer employees per week)	72	34.95%
High (Contact with 21+ employees per week)	134	65.05%
Suicide Prevention Training/Programming		
No training reported in the past 5 years	145	69.71%
Training in the past 5 years (includes talks/lectures, receiving brochures, etc.)	63	30.29%

Table 3.1 Demographics

Note: frequency counts do not always sum to total because of missing data.

Gatekeeper Constructs	Negative/Neutral	Positive
Familiarity with resources (e.g. “Please rate how familiar you are with resources for students who demonstrate suicidal thoughts/behaviors”)	163 (78.37%)	45 (21.63%)
Preparedness to respond (e.g. “Please rate how prepared you feel at this point to identify individuals at risk of suicidal thoughts/actions”)	160 (76.92%)	48 (23.08%)
Gatekeeper Efficacy (e.g. “Please indicate your response on the scale from 1 to 7: I am aware of the warning signs for suicide.”)	167 (80.29%)	41 (19.71%)
Gatekeeper Reluctance (e.g. “Please indicate your response on the scale from 1 to 7: I CANNOT understand why anyone would contemplate suicide.”)	181 (87.02%)	27 (12.98%)

Table 3.2 Gatekeeper Constructs

Note: All questions were scored on a Likert scale from 1-7, with 1 representing strong disagreement and 7 representing strong agreement. Questions that were scored 1-4 were recoded as negative/neutral; questions scored 5-7 were recoded as positive. When a lower score indicated a positive outcome (e.g., lower reluctance to act when someone was in crisis), the scores were reverse coded.

	Model 1: Suicide Prevention Training	Model 2: Personal Experience with Suicide	Model 3: Training and Experience	
	Training OR	Experience OR	Training OR	Experience OR
Preparedness to Respond	4.47 (95% CI: 2.11, 9.46, p=.000)	1.43 (95% CI: .65, 3.13, p=.376)	4.40 (95% CI: 2.06, 9.39, p = .000)	1.12 (95% CI: .49, 2.59, p=.794)
Familiarity with Resources	8.20 (95% CI: 3.67, 18.33, p = .000)	.88 (95% CI: .39, 2.01, p = .770)	9.16 (95% CI: 3.97, 21.16, p=000)	.55 (95% CI: .21, 1.43, p=.221)
Gatekeeper Self-Efficacy	4.76 (95% CI: 1.59, 14.27, p=.005)	1.50 (95% CI: .61, 3.69, p=.383)	4.63 (95% CI: 1.54, 13.97, p=.007)	1.26 (95% CI: .49, 3.21, p=.632)
Gatekeeper Reluctance^	1.25 (95% CI: .46, 3.41, p=.657)	3.84 (95% CI: .86, 17.15, p=.078)	1.07 (95% CI: .38, 2.97, p=.899)	3.80 (95% CI: .84, 17.14, p=.082)

Table 3.3 The Effects of Suicide Prevention Training and a Personal Prior Experience with Suicide on Gatekeeper Constructs

Note: All questions were scored on a Likert scale from 1-7, with 1 representing strong disagreement and 7 representing strong agreement. Questions that were scored 1-4 were recoded as negative/neutral; questions scored 5-7 were recoded as positive. When a lower score indicated a positive outcome (e.g., lower reluctance to act when someone was in crisis), the scores were reverse coded.

*all models were adjusted for age, gender, years of employment at the university, contact with employees, contact with students, and race/ethnicity. For gatekeeper reluctance, race/ethnicity was dropped: race/ethnicity predicted the model perfectly.

CHAPTER 4

PERCEPTION OF SAFETY CLIMATE AND EXPOSURE TO SUICIDE PREVENTION TRAINING

Introduction

Over the past few decades, the field of occupational safety and health has expanded to consider group and organization-level psychosocial influences as a contributing cause of workplace injury (Clarke, 2010, 2013; Garrick et al., 2014; Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002; Stokols, Allen, & Bellingham, 1996). One specific concept that is of particular interest in injury prevention is safety climate—broadly defined as the employee’s perceptions of values, attitudes, and perceptions relating to safety within an organization (Dollard & Bakker, 2010; D Zohar, 1980; Dov Zohar, 2010; Dov Zohar & Luria, 2005). It is important to note that safety climate is generally an aggregate observation of policies, priorities, and practices, rather than an assessment of each element in isolation (Kath, Magley, & Marmet, 2010).

While there is still some discussion around the precise definition, a literature search of safety climate-related articles found the following attributes consistently applied to the concept:

- Safety climate examines the relative safety priorities among elements in an organization;
- Safety climate originates with individual experiences, perceptions, and emotions, eventually becoming a shared assessment of the environment;
- Safety climate synthesizes stated policies and action by all group members into an organizational experience;
- The relationship between leadership and safety climate is generally explained as an extension of management’s perceived investment in group member’s wellbeing;

- Safety climate is persistent over time, and hard to change. (Beus, Payne, Bergman, & Arthur, 2010; Cooper, 2000; Health and Safety Executive, 2005; Dov Zohar, 2010; Dov Zohar & Luria, 2005)

Safety climate aligns with the Social Cognitive Theory, recognizing that there is a dynamic, reciprocal relationship between the workplace as an environment and the individuals acting within it (Figure 4.1). A concept originally developed by Albert Bandura, it supposes that individuals behave based on their perceptions of risk and rewards (Bandura, 1988, 1991). Within the Social Cognitive Theory, individual actions are shaped largely by two constructs (Conner & Norman, 2005). The first is self-efficacy: the perception that individuals believe that they have some control over their actions. The second construct is outcome expectations—the belief that a behavior will lead to an expected consequence. Within an agency or workplace, management has the ability to influence the perception of the environment by emphasizing or de-emphasizing the role of safety by stated and enacted policies. This could lead to meaningful changes in outcome expectations for staff within an organization.

There are practical motivations for assessing safety climate within a workplace. There is some evidence that a relationship exists between safety climate and lower injury rates, and that this association exists at both the organizational and individual level. Prior studies have demonstrated that a perception of a strong safety climate can translate into stronger adherence to safety regulations (Eliseo, 2012). Additionally, perception of management investment in safety has been associated with a lower rate of lost time workdays (O’Toole, 2002). Other research has found an association between both

individual and group-level perception of safety climate and OSHA recordable incidents (Christian, Bradley, Wallace, & Burke, 2009).

Many existing studies on safety climate have focused on testing new climate measures and assessing the relationship between safety climate and specific industries or job groups. Less is understood about how training unrelated to job responsibilities or the workplace's specific hazards impacts perception of safety priorities in the workplace. Our research seeks to expand on the existing literature by examining whether participation in a suicide prevention training program changes the perception of safety climate in the workplace among professional staff in a college environment.

Methods

This research project was nested within a larger study that evaluated the effect of Question, Persuade, Refer (QPR) suicide prevention training with a university population. The data used for this study was taken from the baseline survey (all demographic information, as well as self-reported contact with students and coworkers) and from the six month survey (self-reported enrollment in QPR training, safety climate scores).

Participants

The base population was the approximately 13,000 professional staff employed at the university. Two groups within this population served as sources for recruitment. First, we invited members of the human resources business meeting group to participate in the intervention group, which included a total of 289 staff members employed either in central human resources, or who coordinated human resource responsibilities for their

department or unit. This population included participants at a variety of administrative levels within the organization. The second group, serving as the control group, was recruited from the pool of 502 professional staff that had voluntarily enrolled in at least one Learning and Development course at the university. A total of 791 individuals were invited to participate from these two sources (Figure 4.2).

Potential participants were recruited by email, and completed four surveys: baseline (at enrollment), then one, six and twelve months later. The baseline and six month surveys were used for this analysis. All surveys were conducted online through Survey Monkey. Participants had up to one month to complete the six month survey after the initial reminder email was sent.

The initial recruitment pool was comprised entirely of professional staff, although faculty members and students were not restricted from participation if they had a primary appointment as university staff. Participants were not required to be full-time employees. Individuals who had previously attended QPR gatekeeper training were not eligible for participation in the parent study and therefore are not included in this analysis; at baseline, 15 individuals were excluded for prior participation in QPR training. Other types of suicide prevention training were not excluded—participants self-reported training status at baseline, and prior suicide prevention training was included as a covariate in this analysis. Of the 791 individuals invited to participate, 208 individuals indicated a willingness to enroll in the study and responded to at least one question in this baseline survey, a response rate of approximately 26%. There was strong retention in this research study—195 individuals answered at least one question at six months, a retention rate of approximately 93%.

Exposure Variable: QPR Training

Participation in QPR was the exposure of interest in this study, assessed at six months post-enrollment. QPR training is a short (1-1 ½ hour long) training program that teaches participants how to engage with an individual demonstrating signs of suicidality or a mental health crisis. Participants self-reported their participation in QPR training, which was provided as part of the regular business day at two sessions on campus. Research staff attended both QPR sessions to assure program fidelity with the QPR Institute's guidance and consistency of the training between sessions.

Outcome Variable: Perceived Safety Climate

We combined two existing safety climate instruments to create our own scale. The first was a group level model tool for safety climate, piloted in a manufacturing environment, and modified with permission (Zohar & Luria, 2005). The second was a needlestick prevention safety climate scale, developed by NIOSH and primarily utilized in the healthcare setting (Centers for Disease Control and Prevention, 2010). The safety climate scale used in this study was developed in collaboration with Human Resources and Organizational Effectiveness staff and was thus a participatory, consensus-based tool. There were 10 questions in the safety climate scale—we looked at the mean difference for control and intervention participants for each individual question, and then created a sum safety climate score for the final categorical analysis.

Covariates

We examined a variety of demographic variables: gender, race/ethnicity (recoded as white and other races/ethnicities, due to the prevalence of white participants in this study)

and age (recoded as a categorical variable). We also included years of employment at the university (recoded as a categorical variable), suicide prevention training (coded as a binary variable: any training or programming in the past 5 years, or no training/programming), self-reported contact with students (categorized as high contact, some contact, and low contact), and self-reported contact with coworkers (recategorized as high contact and low contact, based on the spread of the data). The demographic covariates were included to account for expected differences in peer support and health communication, and reflect demographics information collected by other suicide prevention research studies (Tompkins et al., 2010; Wyman et al., 2008). Prior suicide prevention training and contact were included based on a priori evidence from other analysis in this research project. Because age and years of employment at the university were associated (as age increased, so did years of service), we left age out of the covariates of interest.

Analysis

We first used descriptive statistics to determine normality, and performed chi square tests on two of the covariates of interest. Previous analysis in this research study found an association between participation in suicide prevention training/programming and a personal prior experience with suicide. We performed chi square tests to determine whether there was an association between a personal prior experience with suicide and participation in QPR suicide prevention training; we found no association. We also assessed whether there was an association between prior participation in suicide prevention training/programming of any kind over the previous five years and participation in QPR. Again, we found no association.

We then created a sum safety score variable, adding all ten questions on the climate scale, and then analyzed the inter-item correlations and overall Cronbach alpha statistic for the safety climate tool. The internal consistency of the test was quite high: the Cronbach alpha was .95, which is comparable to the alpha statistic on Zohar's organization-level safety climate scale (Zohar & Luria, 2005). Finally, we recategorized the sum safety variable into a categorical variable with three approximately equal sized groups, and then used ordinal logistic regression to consider the relationship between QPR training, safety climate score, and the covariates of interest. All analysis was performed in STATA 13.0

Results

195 individuals were included in this research study (Table 4.1). The participants were largely female (85%), white (94%), and the majority had worked at the university for more than 10 years. About 23% self-reported some prior personal experience with suicide, and about 30% had participated in some prior form of suicide prevention programming. 43 individuals reported participating in QPR training, about 22% of all research participants.

On the 10 item safety climate scale, there was a significant difference between the safety climate scores reported by the intervention and control group on seven of the ten questions (Table 4.2). QPR participants had a higher median safety score for each of the ten items in the scale, and seven of these differences were significant. The largest difference was for the item "New employees quickly learn that they are expected to follow good health and safety practices" in which QPR participants' median score was 5.29 and non-participants was 4.37. The non-significant differences addressed

employees and management working together, management providing helpful health and safety information, and management reacting quickly to solve problems.

In the ordinal logistic regression model, participation in QPR training was highly significant; none of the other covariates were significant in this study (Table 4.3). Participation in QPR training was associated with about a two-fold increase in the likelihood of a high safety climate score while controlling for all other covariates in the model (OR 2.15, 95% CI: 1.04, 4.43).

Discussion

Prior research on suicide prevention in the workplace has found that suicide prevention training programs offer a number of benefits, including reducing barriers to help-seeking behavior and increasing the likelihood that employees engage in discussions about mental health (Cross, Matthieu, Cerel, & Knox, 2007). Our study also indicates that suicide prevention training programs have the potential to positively impact perception of workplace safety, which has been associated with lower rates of workplace injury elsewhere in the literature (Dov Zohar & Luria, 2004; Dov Zohar, 2010).

The field of occupational safety and health has moved to embrace the concept of total worker health in part by emphasizing wellness programs. A recent study by the RAND Corporation found that about 51% of businesses they studied with 50 or more employees had some sort of wellness program in place (Mattke, 2013). And the business community demonstrates strong belief in the effectiveness of wellness initiatives, despite variable clinical differences in health-related outcomes between participants that engage in workplace wellness, as compared to those who decline to participate in these programs

(Baicker, Cutler, & Song, 2010; Caloyeras, Liu, Exum, Broderick, & Mattke, 2014; Mattke, 2013; Sorensen et al., 1998).

However, workplace wellness programs are often solely or primarily focused on physical wellbeing, and reject the importance of mental health promotion at work. Depression and suicide are of particular concern to the working-age population; depression is the leading cause of workplace disability, and a chief contributor to absenteeism and presenteeism (Bender & Farvolden, 2008; Michaels & Greene, 2013; Wang, Simon, & Kessler, 2008). Mental health promotion and suicide prevention in the workplace has been identified as a key prevention activity in the National Strategy for Suicide Prevention.(U.S. Department of Health and Human Services, 2012). This is in part recognizing that suicide rates among working-age individuals have risen dramatically over the past decade while rates for other populations have remained steady or declined slightly, and that interventions for this population are few and far between. There is also some evidence to support the idea that mental health promotion programs in the workplace bolster participants' ability to engage with individuals in distress—but also improve the mental health of participants themselves (Kitchener & Jorm, 2004). Clearly, prioritizing suicide prevention programming in the workplace makes sense as one strategy to improve the mental health of employees.

Our study also demonstrates that suicide prevention in the workplace holds some additional promise—the possibility that training programs like QPR might also improve the perception of safety in the workplace and potentially even contribute to a reduction in workplace injuries. Prior studies of suicide prevention programs in the workplace have found a reduction in other types of injuries (unintentional injuries, moderate and severe

domestic violence), but did not consider workplace injuries, or perception of safety in the workplace (Knox et al., 2003; Ryan, Michael E. and Carlton, 2001). Other studies have identified a positive relationship between workers' perceived investment in health by management, and the overall safety climate within an organization (Mearns, Hope, Ford, & Tetrick, 2010). The possibility that a training program like QPR could not only improve the psychosocial state of the workplace, but also potentially prevent occupational injuries presents an exciting return on investment for organizations that choose to prioritize suicide prevention training.

Our study has a number of strengths. The retention rate from enrollment to six months was over 90%, minimizing any concern about loss to follow up. Safety climate has primarily been assessed in heavy industry (construction and manufacturing) and the healthcare field; examining perceptions of safety in a more static, office-based setting is a unique contribution to the literature of occupational health. The utilization of Zohar's safety scale specifically in an entirely different environment is also a strength. A prior cohort study in the workplace has found an association between suicide prevention training and a reduction in injuries, including intimate partner violence, homicide, and unintentional death by injury, but there was no explicit analysis of workplace injuries (Knox et al., 2003). Our study is the first step to evaluating an association between workplace suicide prevention programming and occupational health—recognizing that perception of safety climate could be an important predictor in overall workplace safety.

Our study does have some limitations. First, a number of individuals who enrolled at baseline as intervention participants did not complete QPR training; we cannot determine if there is a difference between the population that intended to participate, and

those that actually completed the curriculum. We are also mindful that although our retention from baseline to six months was high, the population that enrolled in the study itself may be meaningfully different than human resources personnel, or professional staff in general—more engaged on campus, perhaps. This may be especially true given the nature of QPR gatekeeper training. Next, the cross-sectional nature of this analysis limits our conclusions about whether the training definitely changed perception of safety in the workplace, whether another intervening factor was responsible, or if participation bias is responsible for differences in groups. Our safety climate scale was generated by combining two existing measures; although we developed the safety climate tool in collaboration with human resources professionals to assure its relevance to this population, the generalizability of this scale to other work settings may be limited. Finally, while some prior research has found an association between high perception of safety in the workplace and a reduction in workplace injuries, workplace injuries in an office setting are less common than the industrial environment, so the association between safety climate and workplace injuries may be less relevant to this population, or may not translate to other work environments.

There are a number of areas for future research. First, our data is cross-sectional and future research that examines this relationship prospectively could help delineate the causal nature of this association. Future research could also consider a variety of indicators—days away, transferred, or reduced (commonly called the DART rate), as well as workers compensation claims (total dollars, total days away) before and after a training program. Workers compensation firms operationalize injuries, with an expected time away for each injury based on severity. Deviation from expected time away due to

injury is another possible outcome of interest in the future. The effectiveness of wellness programming is often assessed in part by unplanned sick days before and after an initiative; this could also be a metric for a suicide prevention program's impact.

There are a variety of outcomes related to suicide prevention that could also be of interest in future research, as an indication of the psychological health of the organization. Utilization of EAP services, perhaps assessed through visits per 100 employees, could be indicative of help-seeking behavior. This is a natural metric for suicide prevention programming, and one more way to assess the impact within the psychosocial space of the workplace. Likewise, future organizational suicide prevention—trainings offered, participants enrolled—could signify a meaningful shift in a workplace's prioritization of mental health. Prior research on the topic of suicide prevention in the workplace found an association between any form of suicide prevention training and an increased likelihood of recognizing and responding to a mental health crisis in the workplace among personnel with no clinical responsibilities. This study provides some evidence that in addition to empowering employees to have conversations about mental health more effectively, suicide prevention training may positively impact the overall working environment.

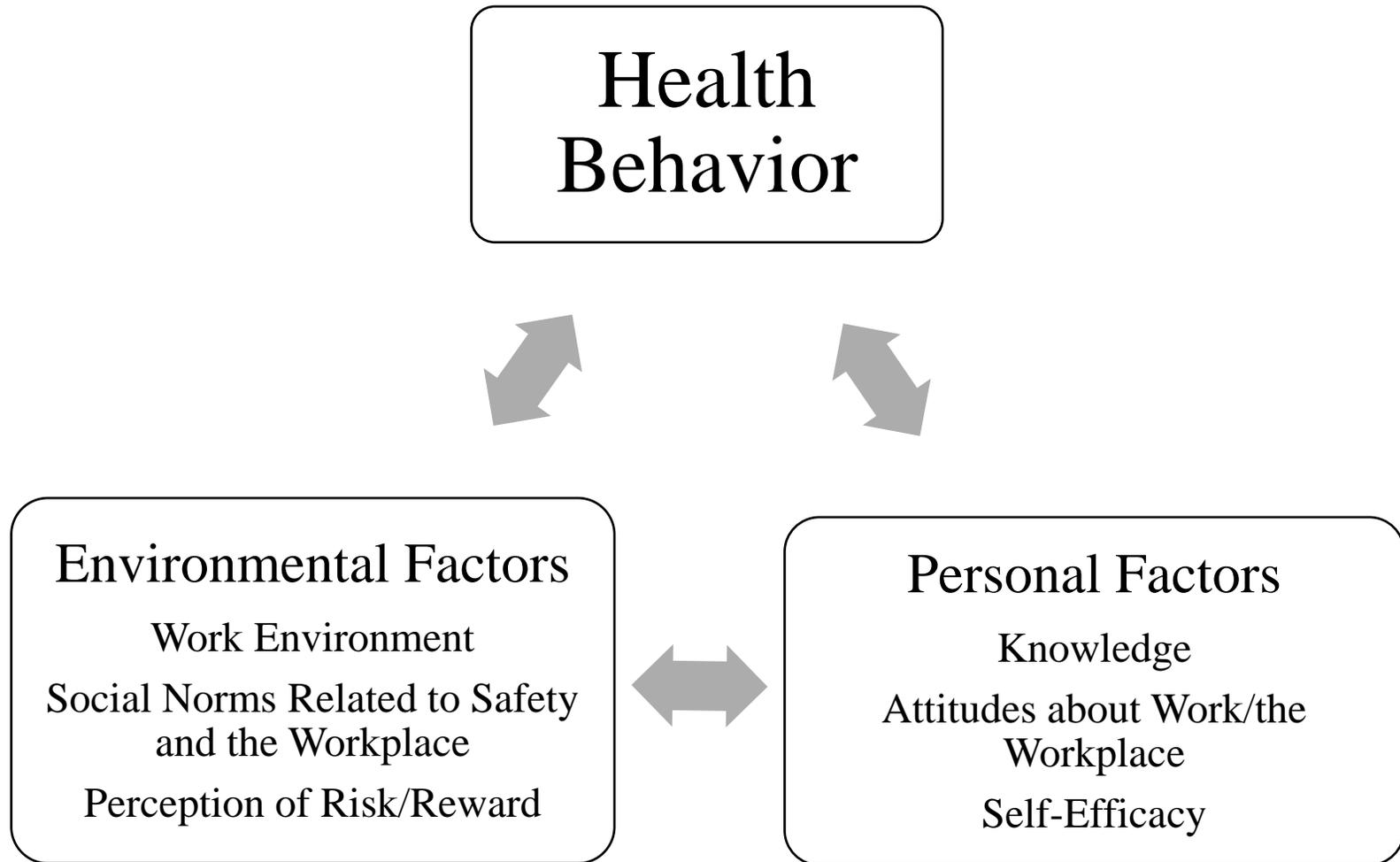


Figure 4.1: Social Cognitive Theory and the Workplace

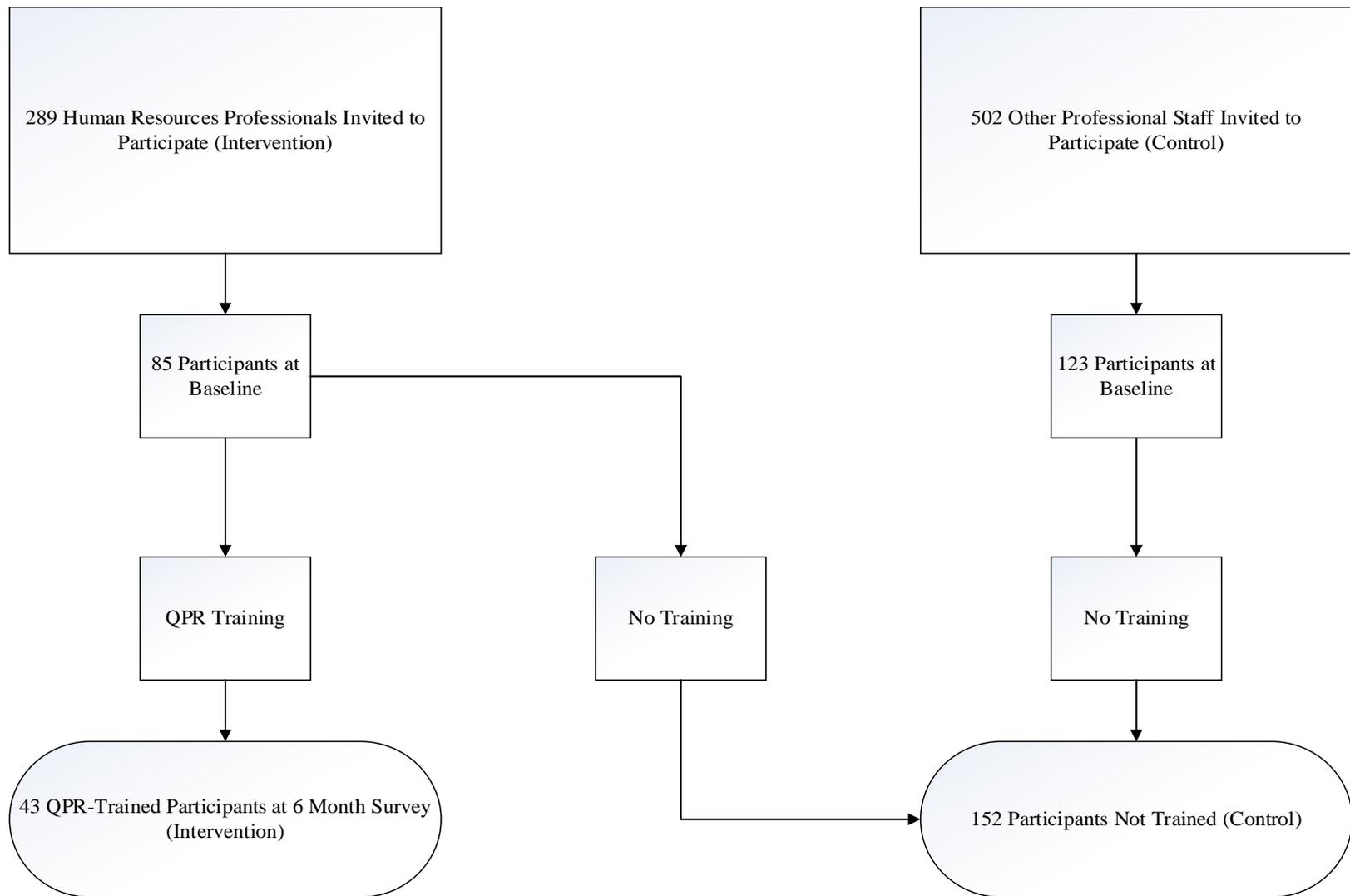


Figure 4.2 QPR Study Enrollment Process

Demographic Variable	Trained in QPR	Not Trained in QPR
GENDER		
Female	37 (23.27%)	122 (76.63%)
Male	6 (20.69%)	23 (79.31%)
YEARS OF EMPLOYMENT		
Less than 10 Years at the University	12 (17.14%)	58 (82.86%)
At least 10 but Less than 20 Years at the University	9 (17.65%)	42 (82.35%)
20+ Years at the University	22 (29.73%)	52 (70.27%)
STUDENT CONTACT REPORTED PER WEEK		
Low Student Contact	24 (29.27%)	58 (70.73%)
Some Student Contact	11 (23.40%)	36 (76.70%)
High Student Contact	7 (10.94%)	57 (89.06%)
EMPLOYEE CONTACT REPORTED PER WEEK		
Low Employee Contact	10 (14.93%)	57 (85.07%)
High Employee Contact	33 (26.19%)	93 (73.81%)
PERSONAL PRIOR EXPERIENCE WITH SUICIDE		
No Personal Prior Experience with Suicide	36 (23.84%)	115 (76.16%)
Personal Prior Experience with Suicide	7 (15.91%)	37 (84.09%)
OTHER SUICIDE PREVENTION TRAINING/PROGRAMMING		
No Prior Suicide Prevention Training/Programming	27 (19.85%)	109 (80.15%)
Prior Suicide Prevention Training/Programming	16 (27.12%)	43 (72.88%)

Table 4.1 Demographics

Note: frequency counts do not always sum to total because of missing data.

	Participated in QPR Training	Did Not Take QPR Training
New employees quickly learn that they are expected to follow good health and safety practices.	Median Score:5.29* SD: 1.17	Median Score: 4.37 SD: 1.50
There are no significant compromises or shortcuts taken when worker health and safety is at stake.	Median Score: 5.64* SD: 1.21	Median Score:5.08 SD: 1.40
Where I work, employees and management work together to ensure the safest possible working conditions.	Median Score: 5.90 SD: .91	Median Score: 5.47 SD: 1.36
Employees are given direct feedback when they do not follow good health and safety practices.	Median Score: 5.19* SD: 1.27	Median Score:4.54 SD: 1.52
The health and safety of workers is a big priority with management where I work.	Median Score:5.79* SD: 1.14	Median Score:5.18 SD: 1.57
I feel free to report health and safety violations where I work.	Median Score:6.00* SD:.99	Median Score:5.51 SD: 1.46
Management in my unit provides workers with helpful information on health and safety issues.	Median Score:5.33 SD: 1.26	Median Score:5.01 SD: 1.47
Management in my unit tries to continually improve health and safety of employees.	Median Score:5.59* SD: 1.12	Median Score:5.06 SD: 1.51
Management in my unit listens carefully to workers' ideas about improving health and safety.	Median Score:5.67* SD: 1.05	Median Score:5.09 SD: 1.54
Management in my unit reacts quickly to solve the problem when informed about health and safety hazards.	Median Score:5.60 SD:1.23	Median Score:5.25 SD: 1.51
	<i>Sum Safety Score: 55.98*</i> <i>SD: 8.88</i>	<i>Sum Safety Score: 50.54</i> <i>SD: 12.55</i>

Table 4.2 Safety Climate Score by QPR Training Status

* Significant at .05

Each item is scored 1-7, with a higher score indicating greater agreement with each statement.

Explanatory Variable	OR	p value
GENDER		
Female	Reference	
Male	1.47 (.61—3.53)	.39
YEARS OF EMPLOYMENT		
Less than 10 Years at the University	Reference	
More than 10/Less than 20 Years at the University	.94 (.43—2.04)	.88
20+ Years at the University	1.52 (.75—3.08)	.25
STUDENT CONTACT WEEKLY		
Low Student Contact	Reference	
Some Student Contact	.67 (.32—1.42)	.30
High Student Contact	.78 (.38—1.61)	.50
EMPLOYEE CONTACT REPORTED PER WEEK		
Low Employee Contact	Reference	
High Employee Contact	1.30 (.70—2.42)	.41
PERSONAL PRIOR EXPERIENCE WITH SUICIDE		
No Personal Prior Experience with Suicide	Reference	
Personal Prior Experience with Suicide	1.55 (.76—3.14)	.23
OTHER SUICIDE PREVENTION TRAINING/PROGRAMMING		
No Prior Suicide Prevention Training/Programming	Reference	
Prior Suicide Prevention Training/Programming	1.01 (.53—1.95)	.97
QPR TRAINING		
Did not participate in QPR Training	Reference	
Participated in QPR Training	2.15 (1.04—4.43)	.04

Table 4.3. The Impact of QPR Training and Demographic Variables on Perception of Safety Climate

CHAPTER 5

Conclusions and Next Steps

This research study has shown a positive, persistent training effect of suicide prevention training programs on a variety of gatekeeper beliefs and behaviors. At the same time, this study has demonstrated some evidence that suicide prevention training programs seem to impact the broader psychosocial space by changing the perception of workplace safety—which has significant implications for the field of occupational health and safety.

There are a number of areas related to suicide prevention and occupational health that deserve additional attention and effort. Online training programs like Kognito At-Risk have started to become much more common in a variety of institutional settings, such as high schools, college/universities, and the military. These programs, which are short (less than an hour) and practice-oriented (the vast majority of training time is spent roleplaying a crisis situation with the use of avatars), show some promise as a prevention strategy. However, there isn't at this point a community-based or workplace-based training program focused on peer adult relationships available in an online training format, despite the high prevalence of suicide among working-aged individuals. As this training modality becomes more common, research needs to demonstrate the efficacy of this approach—as well as assessing whether there is a multiplicative effect of dual training modalities (for instance, QPR plus an online training program).

A great deal of research has examined the association between occupation and mental health. Agricultural workers are one group at elevated risk for depression and

suicidality (Judd et al., 2006; Zwerling, Burmeister, & Jensen, 1995). The National Occupational Research Agenda for agriculture, forestry, and fishing has identified behavioral health surveillance and outreach as a goal for the sector, with particular emphasis on assessing the burden of injury and violence outcomes as a function of stressful agricultural working conditions (NORA Agricultural, Forestry, and Fishing Sector Council, 2008). Expanding the understanding of behavioral health issues specific to this population as well as testing interventions like QPR in an agricultural population seem like a natural extension of this work. This industry also suffers from some of the highest occupational injury rates of any sector; the additional implications on workplace injuries as a function of suicide prevention training are especially promising.

Another occupational group that has suffered a disproportionate burden of suicidality is the military, and there is limited knowledge on the specific occupational exposures that are contributing to the problem. Suicide rates in all branches began a steady increase in 2005; they have since surpassed the age-matched rate in the general population and stabilized at about 18 per 100,000 (LeardMann et al., 2013). However, some research has found that the rates of suicidality pre-enlistment are lower than the general civilian population (Nock et al., 2014). Analysis of the relationship between suicidality and deployment status found no association between combat deployment, number of deployments, or number of deployments—calling into question the commonly held belief that the increase in suicides is strictly related to increased combat duty (LeardMann et al., 2013). Additional work on the occupational exposures that lead to depression and suicide—for instance, days in combat zones, specific job duties or responsibilities—is a natural response to the gaps in the literature. There is also a

movement to incorporate peer-to-peer-mentoring and social support systems around mental health into the military culture, with the intention of increasing help seeking behavior (Friedman, 2015). Program evaluation to address the effectiveness of these strategies on outcomes like suicidality as well as examining upstream behaviors like utilization of mental health services could help military leadership prioritize suicide prevention training most efficiently. Likewise, assessment of the mental health services provided for veterans after they return home from deployment and eventually separate from military life is crucial for understanding the long-term impact of this specific occupation.

Finally, medical students and medical residents are another occupational group that appear to have an increased risk of suicidality. There is some evidence that physicians, especially female physicians, are much more likely than the general population to die by suicide (Frank, Biola, & Burnett, 2000; Schernhammer & Colditz, 2003). Less is understood about suicidality among medical students and residents, although there is a growing awareness of mental health as an issue in this population (Rubin, 2014). Examining the specific occupational triggers for suicidality (e.g. transition/graduation) as well as identifying and mitigating barriers to help-seeking behavior in this population is essential in providing adequate mental health resources on campus and in residency. Physicians, especially primary care physicians, often engage with individuals in crisis—suicide prevention training programs offer the possibility of both enabling doctors to engage with patients more effectively, and potentially improving the mental health state of the physicians themselves (Kitchener & Jorm, 2004; Mitchell, Vaze, & Rao, 2009; Mojtabai, 2013). Research comparing the impact of a variety of

formal suicide prevention training programs, as well as the persistence of any training effect, could be helpful with this population.

Working-aged individuals bear a disproportionate burden of suicidality in the United States. Suicide prevention training programs in the workplace provide the chance to teach individuals how to engage with coworkers around mental health issues. Suicide prevention programs also appear to positively impact the greater psychosocial space of the workplace, with significant potential for the field of occupational safety and health. Future research is needed to address the full impact of this approach.

Appendix 1: QPR Study Survey Instrument (includes QPR and safety climate questions)

**University of Iowa Heartland Center Study
QPR Suicide Prevention: Measuring Knowledge, Skills, and Behaviors
Survey 3: 6 month**

This is the third survey in a research study examining knowledge, attitudes, and behaviors around suicide.

After completing this survey, you will receive a \$5 Java House gift certificate.

Section I: Respondent Profile/Background

1. Please describe your experiences with suicide prevention training/programming since **January 1, 2012** (check all that apply):

- None
- Watched a video
- Attended a talk/lecture
- Read a pamphlet, guide, or book
- Participated in an online program
- Personal experience
- Attended a skills-based training or workshop (please specify): _____
- Other (please specify): _____

2. Did you attend QPR training, which was provided at the HR business meeting in November 2011?

- Yes
- No

3. Please rate how prepared you feel at this point to perform the following (1-7, 1 being not prepared, 7 being very well prepared).

	1	2	3	4	5	6	7
Identify individuals at risk of suicidal thoughts/actions							
Appropriately respond when a coworker expresses suicidal thoughts							
Appropriately respond when a student employee expresses suicidal thoughts							
Ask appropriate questions about suicide							
Persuade a coworker to seek help for suicidal thoughts/behaviors							
Persuade a student employee to seek help for suicidal thoughts/behaviors							

Make appropriate referrals to UI resources for an individual considering suicide							
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4. Please rate how familiar you are with the following (1-7, 1 being not familiar, 7 being very familiar).

	1	2	3	4	5	6	7
Resources for UI employees who demonstrate suicidal thoughts/behaviors							
Appropriate protocol for reporting an employee who shows signs of suicidal thoughts/behaviors							
Resources for UI students who demonstrate suicidal thoughts/behaviors							
Appropriate protocol for reporting a student who shows signs of suicidal thoughts/behaviors							

Section II: Opinions on Health and Safety

<i>Statements</i>	<i>Disagree</i>				<i>Agree</i>		
New employees quickly learn that they are expected to follow good health and safety practices.	1	2	3	4	5	6	7
There are no significant compromises or shortcuts taken when worker health and safety is at stake.	1	2	3	4	5	6	7
Where I work, employees and management work together to ensure the safest possible working conditions.	1	2	3	4	5	6	7
Employees are given direct feedback when they do not follow good health and safety practices.	1	2	3	4	5	6	7
The health and safety of workers is a big priority with management where I work.	1	2	3	4	5	6	7
I feel free to report health and safety violations where I work.	1	2	3	4	5	6	7

Organization Level: Management in your unit ...

<i>Statements</i>							
Provides workers with helpful information on health and safety issues.	1	2	3	4	5	6	7
Tries to continually improve health and safety of employees.	1	2	3	4	5	6	7
Listens carefully to workers' ideas about improving health and safety.	1	2	3	4	5	6	7
Reacts quickly to solve the problem when informed about health and safety hazards.	1	2	3	4	5	6	7

Section III: Opinions

For each of the following statements, please indicate your response on the scale from "Strongly Disagree" (1) to "Strongly Agree" (7).

<i>Statements</i>	<i>Disagree</i> <i>Agree</i>						
1. If a coworker thinking about suicide doesn't acknowledge the situation, there is very little that I can do to help.	1	2	3	4	5	6	7
2. My workplace encourages me to ask coworkers about thoughts of suicide.	1	2	3	4	5	6	7
3. I can make appropriate referrals within my school for employees contemplating suicide.	1	2	3	4	5	6	7
4. I do not have sufficient training to assist employees who are contemplating suicide.	1	2	3	4	5	6	7
5. University professional staff should not be responsible for discussing suicide with employees.	1	2	3	4	5	6	7
6. I feel comfortable discussing suicide issues with my coworkers.	1	2	3	4	5	6	7
7. I don't have the necessary skills to discuss suicide issues with an employee.	1	2	3	4	5	6	7

<i>Statements</i>	<i>Disagree</i>							<i>Agree</i>
8. If an employee contemplating suicide does not seek assistance, there is nothing I can do to help.	1	2	3	4	5	6	7	
9. If an employee contemplating suicide refuses to seek help, it should not be forced upon him/her.	1	2	3	4	5	6	7	
10. A suicide prevention program in my department will give people unwanted ideas about suicide.	1	2	3	4	5	6	7	
11. I know service providers at the UI who can help coworkers contemplating suicide.	1	2	3	4	5	6	7	
12. I am too busy to participate in suicide prevention activities.	1	2	3	4	5	6	7	
13. I am aware of the warning signs for suicide.	1	2	3	4	5	6	7	
14. A suicide prevention program at the UI will send a message to employees that help is available.	1	2	3	4	5	6	7	
15. I cannot understand why anyone would contemplate suicide.	1	2	3	4	5	6	7	

<i>Statements</i>	<i>Disagree</i>							<i>Agree</i>							
16. It is important for University faculty and staff to report identified cases of suicidal ideation to a specified resource.	1	2	3	4	5	6	7								
17. I can recognize individuals contemplating suicide by the way they behave.	1	2	3	4	5	6	7								
18. I do not know most employees well enough to know when to question them about suicide.	1	2	3	4	5	6	7								

Section IV: General Knowledge. (Questions modified from QPR Community Gatekeeper Training.)

1. The great majority of people who think about suicide and want to kill themselves cannot be stopped
(circle one):
 - a. True
 - b. False

2. The number one contributing cause of suicide is (circle one):
 - a. Untreated depression
 - b. Acute and severe stress
 - c. Rejection by a loved one
 - d. Alcoholism, especially if the person has recently been diagnosed with terminal cancer.

3. When talking to an individual you suspect may be in suicidal crisis, which of the following questions should be avoided (circle one):
 - a. You're not thinking of killing yourself, are you?
 - b. Are you thinking about suicide?
 - c. Are you feeling so bad you'd like to go to sleep and never wake up?
 - d. Have you ever wished you were dead?

4. The most commonly identified psychological state of those who take their own lives has been found to be (*circle one*):

- a. Hallucinations
- b. Sadness
- c. Anger
- d. Humiliation
- e. Hopelessness

5. Asking a distressed person if he or she is having thoughts of death or suicide (*circle one*):

- a. Should never be done, as it may put the idea of suicide in the person's mind
- b. Should only be done by professionally trained persons
- c. May lower the risk of suicide
- d. Should have no effect on the risk for suicide

6. You should not be concerned if a coworker or loved one is talking about suicide; most people who talk about suicide never do anything about it. (*circle one*).

- a. True
- b. False

7. Which of the following statements is most true (*circle one*):

- a. Removal of the means of suicide is an important suicide prevention measure
- b. Suicide prevention is best left to the experts
- c. Only doctors should discuss suicide with people who may be thinking about ending their own lives
- d. Drugs and alcohol play only a minor role in suicidal behavior

8. Which of the following is not a possible warning sign of suicide (*circle one*):

- a. Giving away prized possessions
- b. A sudden interest or disinterest in religion
- c. Talking about suicide
- d. Spending lots of money one doesn't have

9. Which of the following are warning signs that an individual may be considering suicide? (**check all that apply**)

- Neglect of his/her responsibilities
- Sudden happiness after being very unhappy
- Substance abuse
- Giving away possessions

[] Withdrawal from activities/groups that were once important

Section V: Behaviors/Experiences

Please think about your experiences at the University, and how many times **since January 1, 2012** you've done the following (please choose one response per row):

	Never	1	2	3	4 or more
Thought an employee/coworkers' behavior might indicate s/he was considering suicide?					
Thought a student's behavior might indicate s/he was considering suicide?					
Thought an employee/coworkers' behavior might indicate s/he was very distressed or depressed?					
Thought a student's behavior might indicate s/he was very distressed or depressed?					
Asked a coworker/employee whether s/he was considering suicide?					
Asked a student whether s/he was considering suicide?					
Asked a coworker/employee about his/her distressed or depressed mood?					
Asked a student about his/her distressed or depressed mood?					

Please think about your experiences at the University **since January 1, 2012:**

	None	1	2	3	4 or more
How many employees/coworkers did you personally refer to appropriate resources because you were concerned that they might be depressed?					
How many students did you personally refer to appropriate resources because you were concerned that they might be depressed?					
How many employees/coworkers did you personally refer to appropriate resources because you were concerned they might be suicidal?					
How many students did you personally refer to appropriate resources because you were concerned they might be suicidal?					

Do you have any experiences with suicide you would like to share?

Thank you for your participation in this survey!

Please enter your email address to receive a \$5 gift card from Java House: _____

Please check here if you do NOT want a gift card from Java House:

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