

The Counseling on Access to Lethal Means (CALM) Gatekeeper Training Improves Confidence
in Suicide Prevention Techniques Among a Sample of Academic Advisors

by

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Abstract

Suicide is a persistent and worsening public health problem in the United States. Currently, suicide is the tenth leading cause of death among the general US population, and the second leading cause of death among individuals ages 10–24 according to the Centers for Disease Control and Prevention. Efforts to address the suicide problem in the United States and elsewhere have been substantial and implemented in various contexts. However, there is ample skepticism about the effectiveness of these programs in the context of suicide rates that have steadily increased since 1999. Consequently, there has been a recent shift towards using models that promote the concept of means safety or lethal means reduction. The Counseling on Access to Lethal Means (CALM) Model is a lethal means reduction model that has been implemented in various contexts, including K-12 schools and college campuses. In the current study, a gatekeeper version of the CALM training was given to a group of 16 academic advisors on the campus of Appalachian State University. Confidence in implementation of suicide prevention (SP) and means reduction (MR) was assessed pre-training (baseline), post-training, and after a 4 to 6 week follow-up. Results suggested that there was a significant increase in confidence levels when advisors were asked about MR practices from baseline to post-training. There was also an increase in MR confidence level averages from post-training to follow-up, however, this increase was not significant. These results are suggestive of CALM training effects in regards to MR practices and it might indicate that CALM should be integrated into a larger, more comprehensive SP training.

Keywords: suicide, suicide prevention, means reduction, CALM, gatekeeper, confidence

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The Counseling on Access to Lethal Means (CALM) Gatekeeper Training Improves Confidence in Suicide Prevention Techniques Among a Sample of Academic Advisors

Suicide is a persistent and worsening public health problem in the United States. Currently, suicide is the tenth leading cause of death among the general US population, and the second leading cause of death among individuals aged 10–24 according to the Centers for Disease Control and Prevention (2018). Efforts to address the suicide problem in the United States and elsewhere have been substantial and implemented in various contexts. The majority of the prevention programs focus on reducing risk factors that are associated with why individuals develop suicidal thoughts (e.g., history of depression), enhancing protective factors (i.e., increasing social support), and increasing knowledge of suicide factors and general confidence in using prevention techniques for those at risk (Lamis, Underwood & D’Amore, 2017). Although these programs appear comprehensive in nature, their impact on suicide rates overall have been minimal to none. In fact, suicide rates have increased steadily each year from 10.75 (per 100,000) in 2001 to 14.48 in 2017 in the United States (CDC, 2018; May & Klonsky, 2016). Many prevention programs give less consideration to the often unpredictable rapid progression from suicide thoughts to attempts and the importance of access to lethal means. The connection between the means used in a suicide attempt and the chance of survival of that attempt is significant. The most common means used in the U.S. are overdose whereas the most lethal means are firearms. Given this information as well as the fact that the rates have steadily increased, many suicide prevention programs have pivoted to emphasize the “how” versus the “why” people die by suicide. These models are broadly referred to as “means safety” programs. One such program, the Counseling on Access to Lethal Means (CALM) Model, focuses on

reducing access to highly lethal means. The following section summarizes the literature regarding the rationale for shifting more to means safety programs.

Rapid progression from ideation to action

Past prevention efforts have paid less attention to how a lack of forethought (or rapid action) plays a role in suicide attempts and overall rates. Most research addressing this rapid progression regarding suicidal crises examines how the suicidal process can evolve quickly and unpredictably. According to Kattimani, Sarkar, Menon, Muthuramalingam and Nancy (2016), the suicidal process is defined as the latency between onset of a suicidal thought and the actual attempt. In using that definition, Kattimani et al. (2016) examined the average amount of time that lapsed between the initial suicidal thought to making the attempt among a sample of survivors. In their sample of 244 survivors, over half claimed that there were fewer than 30 minutes between the onset of their suicidal thought and the initiation of their suicide attempt. This short passage of time between initial thought and action makes predicting death by suicide difficult and it justifies a pivot to understanding the impact of having ready access to lethal means as a stronger predictor of suicide death.

The importance of the rapid progress from thought to action was also studied by Deisenhammer, Ing, Strauss, Kemmler, Hinterhuber and Weiss (2009). In that study, patients who had made a recent suicide attempt were admitted into a psychiatric hospital and were interviewed about their suicidal process. The interviews took place within 3 days of their attempt so that the researchers were able to gather details about the attempt process. Of the 82 patients who were interviewed, nearly half (48%) said that only 10 minutes had passed between their initial thought about attempting and their actual attempt. These studies indicated that there is

often little to no planning and that the attempters are acting very quickly, leaving fewer opportunities for intervention, especially in the context of highly accessible lethal means.

An earlier study also asked attempt survivors about their process and 5% claimed that less than 1 second elapsed between thought and attempt. Another 24% stated that the process in total was less than 5 minutes (Simon, Swann, Powell, Potter, Kresnow & O'Carroll, 2001). The same study also found that attempt survivors that had used "violent methods," or typically fatal means, were more likely to have made a quicker attempt. These results are similar to a study by Lubin, Werbeloff, Halperin, Shmuckevitch, Weiser and Knobler (2011). Lubin et al. found that having ready access to lethal means (particularly firearms) could increase the overall likelihood that an attempt would result in death. Further, they said that having some sort of barrier between the attempter and their intended means could require more planning and thus decrease their urge to take initial action. Past research on this relationship implies that choice of means can be impacted in suicidal crises and that when the duration of a suicidal process is brief (impulsive) there is a slimmer chance of survival. Overall, given these findings, more research is needed on the important relationship between lethal means and rapid progression from thought to action.

Why Means Matter

As indicated earlier, the connection between choice of means in a suicide attempt and the chance of survival of that attempt is significant. Suicidal methods vary from person to person, but there are common trends to identify (like choice of means) that might be the difference between saving a life or death by suicide. As outlined above, the suicidal crisis (or process) is often brief. That is, the majority of attempt survivors thought about making an attempt for 30 minutes or less before taking initial action. Knowing that there is typically a slim window of time

to intervene between onset of thought and attempt leads researchers and clinicians to examine what other factors can help prevent death by suicide.

In addition to brief crises, it is important to closely monitor the common methods that are being used. It is known that some methods are far more lethal than others. Of all typical methods, firearms are fatal nearly 90% of the time that they are used in an attempt (CDC, 2018). When compared to other common methods like cutting or overdose, which are only fatal 1–2% of the time, access to firearms is a significant concern for clinicians. With suicide being the second leading cause of death among youth between the ages of 10 and 34 (CDC, 2018), it is important to look at the means by which suicides in that age range are more commonly completed. According to the Suicide Prevention Resource Center (2016), the most common means for suicide among males ages 15–24 is firearms. In fact, 52% of male deaths in this age group are attributed to firearms. Among females of the same age range, the most commonly used method is suffocation (45%), followed by firearms (28%) and then poisoning (18%). It is clear that there is a connection between choice of means and suicide rates. In choosing more lethal means, there is a lower chance of survival, which leads to a higher number of deaths.

In the media, we see frequent reports of firearms being used in homicides, but there is less media coverage of suicides, despite the fact that most firearm deaths are suicides (59% in NC; 78% in western NC; CDC Wonder, 2018). It is important to shed light on the fact that although we frequently are exposed to homicide rates, the number of suicides due to firearms is almost double the rate of firearm homicides (Siegel and Rothman, 2016). In fact, just over 50% of all deaths by suicide in both 2016 and 2017 were due to firearms (CDC, 2018). Firearms are a big concern mainly for their lethality, but also for their accessibility. In 2017, approximately 30% of adults in the US said they owned a gun and another 11% of adults claimed to live with

someone that did (Parker, Horowitz, Igielnik, Oliphant & Brown, 2017). Those that live in a home where a firearm is present, are at higher risk for suicide by that method. Given that most attempters utilize means to which they have immediate access, the presence of a firearm and the lethality of that method can be the difference between life and death (Barber & Miller, 2014). The existing knowledge that there is increased suicidal risk when methods are readily available, it is important to explore ways to reduce the risk associated with easy access to lethal means.

Evidence for why means matter has been explored in looking at attempt survivors (their suicidal process) and lethality of certain methods over others, but researchers have also looked at why means matter when an attempt is made and the attempter survives. If someone is in a suicidal crisis and they quickly choose to attempt with a firearm, their chance of survival is going to be much slimmer than if they were to attempt by cutting. This is an important concept to keep in mind when looking at attempt survivors and their life outcomes. According to Carroll (2014), over 90% of people that attempt suicide do not go on to later die by suicide. This indicates that there is a large number of lives that could be saved from future fatal attempts if they can survive their initial attempt. With this information, clinicians and prevention researchers are working hard to try and prevent death even among attempts, and knowing why means are important can help with these efforts.

Lastly, it has been crucial to explore the thoughts of attempt survivors far past their crisis and choice of means. Often, people who are suicidal are ambivalent. Over the years there have been many attempted deaths by jumping from the Golden Gate Bridge, and a very small percentage of survivors. *The New Yorker* (2003) was able to speak to one attempt survivor, Ken Baldwin. Ken attempted to take his life by leaping off of the bridge, but as soon as he did, he regretted it. Upon his survival he claimed, "I instantly realized that everything in my life that I'd

thought was unfixable was totally fixable—except for what I’d just done (jumped).” Ken is not the only case that we have seen with this instant regret. Drum (2009) studied 1321 adults that had seriously considered suicide. Of the adults who actually initiated an attempt, 15% reconsidered their decision after they began. Even fewer (12%) of those adults followed through with their attempt. In hearing stories like Ken’s and reading studies about uncompleted attempt rates, it can be inferred that most people who consider suicide do not actually want to take their lives.

Means by which suicide attempts are made play a vital role in the outcome. Most people in a suicidal crisis do not take long to initiate their attempt, and if they happen to attempt with highly lethal means (like firearms) there is less of a chance for their survival. When attempters start an attempt with far less lethal means (like cutting) there is the chance for them to change their minds and get help. For those that do try and survive, they are unlikely to go on to die by suicide later in life, so it is imperative that their attempt not be fatal so that intervention can be implemented. After all, of the attempt survivors studied, most regret or second guess their decision seconds after they begin their attempt. Means matter when it comes to attempt survival, so if clinicians or gatekeepers can create time or distance between an individual considering suicide and lethal means, it could be the difference between life and death.

Implementation of Means Reduction

To address the lack of emphasis on lethal means and their relation to suicide rates, researchers have started to look at the impact that means reduction practices could potentially have. Through these response efforts, a number of research studies have shown that reducing access to lethal means (such as firearms) have correlated with lower completed suicide rates (Milner, Witt, Maheen & MaMontagne, 2017). In a recent study that looked at coping strategies for suicidal individuals, it was found that limiting access to lethal means was at an all-time low.

The researchers (Czyz, Horwitz, Arango, Cole-Lewis, Berona & King, 2016), noted this as concerning because of the substantial evidence behind limiting access and its impact on decreasing the risk for suicidal behavior. In order to act on the evidence that has been seen for means reduction, various suicide prevention programs focused on means reduction have been in review.

Although there is little research on existing means reduction interventions, early implementation of means reduction practices and their effectiveness has been seen in other parts of the world. In Southeast Asia the most common means for suicide has been pesticide poisoning, accounting for approximately 80% of suicides (Knipe, Chang, Dawson, Eddleston, Konradsen, Metcalfe & Gunnell, 2017). In specifically Sri Lanka, suicide rates -attributable to pesticides- were extremely high in the 1990's. In order to address the alarming number of deaths, the World Health Organization (WHO) placed bans on pesticides between 1984 and 1997. With this ban in place the suicide rate in Sri Lanka dramatically decreased and continued to do so between the years of 2011 and 2015. In those 4 years, the suicide rate was lowered by 50%. However, although the rate of suicide was lowered, it is interesting to note that the attempt rate utilizing means other than pesticides remained consistent. With no evidence of decrease in anything other than suicide deaths, it is important to realize that the presence of suicidal behavior (ideation or attempts) wasn't changing, but the lethality of attempt methods was. This dramatic decrease in fatality can be a result of the reduction that was placed on pesticides due to their lethality.

In a similar fashion to pesticide reduction in Sri Lanka, the Israeli Defense Force (IDF) also began limiting access to lethal means. According to Lubin, et. al (2011), from 2003-2005 the IDF experienced, on average, 28 deaths by suicide each year and over 93% of them were by

firearm. Adolescents (ages 18-21) drafted into the IDF were able to travel off base on weekends, and they often carried their weapon with them. With nearly 100% of the IDF suicides being attributable to firearms, the IDF's Mental Health Department decided to update their check-out policy. Beginning in 2006, soldiers in the IDF were no longer able to carry their firearms off base for weekend trips. Instead, they were required to turn over their weapon upon check-out. Since the policy change, suicides among soldiers by firearm have been reduced by nearly 40%. Similar to what happened in Sri Lanka, suicides of IDF soldiers by other methods remained consistent. Again, it is possible that restricting access to lethal methods (in this case, firearms) is a major contributor to the decrease in suicide rates among these populations.

Counseling on Access to Lethal Means

One means reduction program that has been developed and is continually being researched is the Counseling on Access to Lethal Means (CALM) Model. CALM trainings strive to train professionals (and helping providers) with strategies that can help reduce a suicidal individual's access to any lethal means, especially during times of crisis (Sale, Hendricks, Weil, Miller, Perkins, & McCudden, 2017). CALM training was developed in New Hampshire by Elaine Frank and Mark Ciocca as well as Cathy Barber from the Harvard School of Public Health. This training program is designed to last approximately 1.5 to 2 hours, and it includes a number of components. The framework of CALM is meant to help providers identify those at suicide risk that might benefit from means reduction counseling (by providing background on suicide data), provide helpers with tools to start conversation about lethal means, and to teach trainees how to work with families of those at risk to reduce access. CALM training suggests reducing access to all lethal means; however, there is a particular focus on firearms. Although CALM places emphasis on firearms, the main objectives of the training program are to increase

knowledge of suicide prevention and means reduction practices which, in turn, should help increase confidence among providers in implementing those strategies.

Though the literature on the effectiveness of the CALM trainings is somewhat limited there have been positive outcomes thus far. Barber and Miller (2014) noted that CALM has the potential to help prevent death if implemented effectively in a number of scenarios. They predicted that if MR counseling were utilized in all households where both a firearm and suicidal individual are present, then proper means reduction could lead to approximately 3,600-3,900 lives saved each year. In addressing the impact that the CALM training has on potential providers, Sale et al. (2017) conducted a study that highlighted how effective the CALM training was among mental health professionals. The training suggested an increase in the knowledge that the professionals had about suicide, as well as their confidence when implementing means reduction practices with suicidal clients. Both knowledge expansion and confidence in intervention are main objectives of CALM and so far, the program is seeming to meet both of those objectives.

Not only is CALM being used among mental health professionals but it has been taught to several “gatekeeper” populations. A gatekeeper can be defined as anyone in a helping profession with the potential to come in contact with someone at risk of suicide. In order to potentially reach a larger population of those at suicidal risk, CALM trainings are becoming more widespread among gatekeeper populations (e.g., teachers, paramedics, police officers, etc.). Gatekeeper versions of CALM are shorter than the full 3-hour basic CALM training, and they are typically adapted to fit populations that the gatekeepers’ work environment (emergency services, medical settings, schools, college campuses). So far, some gatekeeper trainings have been given and they show similar results for effectiveness as seen in the Sale et al. (2017) study

previously mentioned. The CALM gatekeeper trainings have resulted in significant increases of suicide knowledge and again, confidence in ability to put forth prevention efforts (Lamis, Underwood & D'Amore, 2017). With some existing evidence of improved confidence and knowledge among gatekeepers, it might be worthwhile to continue to train gatekeepers of a variety of profession in CALM.

The Present Study

The current study is a replication of a previous research endeavor by Rosen (2019), who found that a CALM gatekeeper training framework was associated with increased confidence of suicide prevention (SP) skills among a sample of resident assistants. Rosen's study aimed to evaluate a gatekeeper version of CALM when given to a group of resident assistants (RAs) on a Southeastern college campus. Given previous research on gatekeeper training effectiveness, Rosen hypothesized that RAs would experience an increase in confidence of implementing SP and MR practices after receiving the CALM training compared to their confidence levels at baseline. Rosen found support for her hypothesis wherein she reported moderate to large effects regarding confidence levels following the training when compared to confidence levels prior to training.

Given Rosen's (2019) findings, we expect to find similar outcomes in a sample of academic advisors. That is, we hypothesize that our sample of academic advisors will exhibit higher average confidence levels in implementing both SP and MR practices at follow-up compared to baseline. Appalachian State University's Institutional Review Board approved this study (#19-0146) on December 19, 2018 (see Appendix A).

Methods

Participants

The participants in this study included a sample of 16 academic advisors from Appalachian State University. The advisors came in to view a gatekeeper version of the CALM master training to develop skills and knowledge in the area of suicide prevention and means reduction practices. This training was optional training for advisors to attend as part of an “advisor development” session where, each month, they focus on building a comprehensive set of skills to best serve the student population of a Southeastern college campus. Academic advisors work with students to both create an ideal educational path and to guide them while they pursue their degree.

Out of 16 present advisors, 100% provided consent (see Appendix B) to participate in the current study. The advisors were between the ages of 26 and 62 ($M = 43.3$, $SD = 12.4$). There was a strikingly uneven ratio of male to female participants. Of the 16 advisors that were in attendance, 18.8% were male ($n = 3$) and 81.3% were female ($n = 13$). A total of 3 advisors had previously heard about CALM as a prevention strategy, but none had ever been exposed to the training framework. Aside from specifically CALM training, 18.3% ($n = 3$) of the participants indicated that they had previously received some form of SP training while 18.8% ($n = 3$) said that they had not. In addition, 62.5% ($n = 10$) of our sample noted that they have had some sort of relevant mental health (MH) training. In a sample of 16, only 3 participants (18.8%) claimed to have never been introduced to either SP or MH related trainings. Only 10 participants completed the follow-up measure. No compensation was offered for agreement to participate in the study. As mentioned previously, the training was optional and advisors were given the choice

to opt out of participation when they completed the consent form (see Appendix B) prior to the training.

Measures

Participants responded to a revised measure of the *Suicide Prevention Training: Learning and Development Evaluation form* (see Appendix C) used in the original study by Rosen (2019). The measure that was used in Rosen's study was obtained and revised from another researcher, Lisa Marzano, the primary contributor of the original scale, *Confidence in Suicide Prevention Measure*. Rosen was granted permission to revise the original scale to better address CALM practices and to collect demographic information on her participants, who were resident assistants.

In the current study, we revised the *Suicide Prevention Training: Learning and Development Evaluation Form* (see Appendix C) to match our population of participants, academic advisors. The measure included demographic information, such as age, gender, and number of years as an academic advisor. In addition, the measure asked for information about past experience with suicide prevention or mental health related trainings. Immediately following the demographic information, the measure addressed confidence and knowledge in suicide prevention (first 4 items) and means reduction counseling (last 3 items) using 5-point continuous Likert Scales the options for which ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), where higher scores indicate higher perceived confidence. The same evaluation form was used at baseline (T1), post-training (T2) and a digital version was created and sent out via Qualtrics, an online survey system, at follow-up (T3).

Procedure

As advisors arrived at the training session (approximately 10-15 minutes prior to the start of the training), they each were given a random envelope labelled with a number that contained the consent form (see Appendix A) as well as the initial evaluation form (*Suicide Prevention Training: Learning and Development Evaluation Form*) found in Appendix B. Upon distribution of the envelopes, the researchers informed advisors of the possibility to become participants in the current study and instructed them to either consent to participate, or opt out of involvement. The researchers asked those who gave initial consent to participate to provide their email addresses so that a follow-up evaluation form could be sent approximately 4–6 weeks following the initial training on February 5, 2019. After the completion of the consent form, the researchers asked participants to complete the initial (pre) evaluation form, which allowed us to assess confidence levels of SP and MR items at baseline (T1). Once participants were finished with the initial evaluation form, they placed both their consent form and initial evaluation in the envelope labelled with their participant number. Once all of those steps were completed, the training session began.

Kurt Michael, a psychologist and professor at Appalachian State University, was the trainer during the CALM training session. The training was held in an on campus multi-purpose room where the advisors meet for staff development. Over the next hour, Michael facilitated the training that consisted of PowerPoint slides, oral presentation, videos, and conversation surrounding the importance of means reduction practices and other relevant information. Approximately 5 minutes after the training session had ended, participants completed the post-training survey. The post training survey was the same *Suicide Prevention Training: Learning and Development Evaluation Form* that was administered at baseline (T1). Once all of the

participants had completed the T2 survey, the envelopes were collected, and the participants were debriefed. We then reminded the advisors of the follow-up survey that would be sent to them through email about one month later, and thanked them for their time and willingness to participate in the study.

Directly after the training session, data from T1, T2, and participant demographic information was entered into SPSS, a statistical analysis computer software. In order to ensure confidentiality of participants, all of the demographic information and item responses were entered under the participant number (e.g., 001, 002) and were not attached to their provided email address. Responses to the SP and MR items were encoded by both item number and time (e.g., Q_1_T1, Q_1_T2, etc.) where Q_1 through Q_4 represented SP items and Q_5 through Q_7 represented MR items. All consenting participants received a follow-up evaluation via Qualtrics approximately 4-6 weeks after the initial training session. This was done to measure the changes in knowledge and confidence of SP and MR practices. Once data were collected from all the participants who completed the follow-up survey ($n = 10$), responses were encoded in SPSS for T3 following the same procedure as T1 and T2.

Analysis

SPSS (Version 24) was used for all analyses. Both descriptive and frequency analyses were run to assess demographic information of the sample (see Table 1). Reliability (Cronbach's Alpha) and item statistics for both SP and MR items were computed at each evaluation interval (e.g., T1, T2, T3). In addition, we ran a paired samples t-tests to assess any significant differences in confidence shown within both SP and MR items over time (see Table 3). Paired samples t-tests were computed between baseline (T1) and post-training (T2) and between post-

training (T2) and follow-up (T3) for both SP and MR items individually. Using the composite means for SP (4 items) and MR (3 items) at each time point (see Figure 1), we then computed mean difference effect sizes (Cohen's d between baseline vs. post-training and post-training vs. follow-up). After we adjusted for multiple t-tests (Bonferroni corrections), the critical p value was .0125. Cohen's d effect sizes were computed based on a 95% confidence interval and following the 1998 suggested interpretive effect size guidelines (0.2 =small; 0.5 = medium; 0.8 = large).

Results

Results from the descriptive and frequency analyses of participants demographics can be found in Table 1. All means, standard deviations, and sample size data for each survey item at each evaluation point can be found in Table 2. Due to the relatively high attrition rate, there was a loss in the number of participants between baseline ($N = 16$) and follow-up ($n = 10$); indicating a 62.5% response rate at follow-up.

We used Cronbach's alpha to test the internal consistency of our evaluation items. This analysis was done at each evaluation point for both SP and MR items. We found Cronbach's alpha for SP items to show moderate to high internal consistency: ($\alpha = .811$ baseline), ($\alpha = .870$ post-training), ($\alpha = .930$ follow-up). In contrast, the reliability analysis for MR items showed lower levels of reliability at each evaluation point ($\alpha = .606$ baseline), ($\alpha = .661$ post-training), ($\alpha = .703$ follow-up) when compared to SP items.

After we assessed for internal consistency, we calculated overall composite means for all items at each evaluation point (where higher scores indicate higher levels of perceived confidence; see Figure 1). We found that overall, for both constructs (SP and MR) advisors exhibited moderate to high increases in confidence from baseline to post-training and again from

post-training to follow-up. For SP items (where the composite mean was out of 20) there was a moderate increase in confidence from baseline ($M = 13.44$, $SD = 3.08$) to post-training ($M = 14.5$, $SD = 3.16$), where $N = 16$ and a slight increase again at follow-up ($M = 14.6$, $SD = 4.32$) where $n = 10$. When it came to MR items (where the composite mean was out of 15), advisors showed a high increase in confidence at each evaluation time. For MR items there was a large increase in confidence from baseline ($M = 8.44$, $SD = 2.28$) to post-training ($M = 12.31$, $SD = 1.66$) where $n = 16$ and again a moderate increase at follow-up ($M = 13$, $SD = 2.05$) where $n = 10$.

Next, a paired samples t -test was conducted to determine if there was any statistically significant difference in the composite means of confidence levels of both constructs across intervals. This analysis was run for SP and MR items comparing baseline to post-training and post-training to follow-up. Based on the results from the paired samples t -test, we found one significant difference in advisors confidence levels (see Table 3). The significant results were determined where $p \leq .0125$, and the significant difference was seen when baseline was paired with post-training for MR items. This pair for MR (T1 and T2) showed a significant difference in mean confidence levels ($p = .000$).

In addition, we computed effect sizes (Cohen's d) for comparisons between time intervals (Bonferroni correction: $p \leq .0125$; see Table 3). The SP baseline to post-training comparison was not statistically significant ($p = .042$) and showed a small effect size ($d = .339$, 95% CI = $-.358$ – 1.038). When we compared the SP items from post-training to follow-up there was again no significant increase in confidence ($p = .825$) and a small effect size ($d = .048$, 95% CI = $-.828$ – $.925$). In contrast, the MR items showed a statistically significant increase ($p < .001$) from baseline to post-training and a large effect size ($d = 1.94$, 95% CI = 1.1 – 2.781). In contrast, there

was not a statistically significant difference ($p = .413$) for MR items from post-training to follow-up and there was a small effect size ($d = .253$, 95% CI = $-.627-1.133$). Though the difference between MR at post-training and follow-up was not significant, the gains in confidence observed from pre- to post-training were sustained at follow-up.

Discussion

The results of this study suggest there were modest to large training effects among a group of academic advisors who were administered a Gatekeeper version of CALM training. The findings revealed a statistically significant and practically large increase in advisors' confidence in using means reduction principles at the conclusion of a CALM Gatekeeper training, and that the gains were sustained after a 4 to 6 week follow-up. Though there was a slight increase in the advisors' confidence using general suicide prevention techniques from baseline to post-training, it was neither statistically significant nor of a large magnitude. The differential findings between SP and MR might be attributable to the fact that most advisors were much less familiar with MR principles to begin with and showed what appeared to be appreciable gains in knowledge at the end of the training that remained durable after a 6-week follow-up. During the training itself, the researchers asked how many trainees had heard of lethal means reduction programs, and only 3 advisors (19%) responded in the affirmative and none had been trained prior to the February 5, 2019 training. Therefore, there was a higher ceiling for improvements in the MR items. These results mirrored what Rosen found (2019) in her study. In particular, there were larger effect sizes for MR items when compared to SP items, and she conjectured the difference might have been due to the novel exposure of MR principles emphasized in the CALM training. In contrast, academic personnel (such as RA's or Academic Advisors) are typically trained in suicide prevention techniques that do not necessarily include means reduction concepts.

Unlike Rosen's study where there was a decay in confidence from post-training to follow-up, our results revealed that the gains were maintained from baseline to post-training to follow-up for both SP and MR items. Having a consistent increase from post-training to follow-up is interesting due to the longer passage of time (approximately 1 month) between the two evaluations. Overall, these findings suggest that the Gatekeeper version of CALM was associated with relative improvements in confidence among academic advisors in implementing both suicide prevention and means reduction techniques that remained stable over a 6-week follow-up.

Though we found some support for the primary hypothesis, these findings are tempered by some significant limitations of the study. The primary limitation was that our study was underpowered, rendering any conclusions tentative at best. In addition, among the 16 academic advisors, there was a lack of diversity on many fronts, including demographic and experiential limitations. The attrition rate (39%) from post-training to follow-up was also a concern. Since this was a Gatekeeper version of CALM training, it is important to continue to assess how other gatekeeper groups will respond and grow from this training and whether it is associated with actual changes in behavior. That is, do those trained in CALM implement means reduction principles consistently and with fidelity? In future research, these questions should be addressed directly and in studies that are adequately powered.

In conclusion, the findings of this study and the evaluation conducted by Rosen (2019) suggest that gatekeeper version of CALM shows promise in improving confidence among staff in the college setting in implementing a means reduction approach with individuals at risk for suicide. It will be important to evaluate whether improved confidence translates to actual behavior change among gatekeepers in college environments.

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Appendix A

IRB Approval

To: Kurt Michael

Psychology

CAMPUS EMAIL

From: Dr. Andrew Shanely, IRB Chairperson

Date: December 19, 2018

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

STUDY #: 19-0146

STUDY TITLE: Does the Counseling on Access to Lethal Means Gatekeeper Training Improve Confidence in Suicide Prevention Techniques Among a Sample of Academic Advisors?

Submission Type: Initial

Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.

Approval Date: 12/19/2018

Expiration Date of Approval: 12/18/2019

The Institutional Review Board (IRB) approved this study for the period indicated above. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

All approved documents for this study, including consent forms, can be accessed by logging into IRBIS. Use the following directions to access approved study documents.

1. Log into IRBIS
2. Click "Home" on the top toolbar
3. Click "My Studies" under the heading "All My Studies"
4. Click on the IRB number for the study you wish to access
5. Click on the reference ID for your submission
6. Click "Attachments" on the left-hand side toolbar
7. Click on the appropriate documents you wish to download

Approval Conditions:

Appalachian State University Policies: All individuals engaged in research with human participants are responsible for compliance with the University policies and procedures, and IRB determinations.

Principal Investigator Responsibilities: The PI should review the IRB's list of PI responsibilities. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records.

Modifications and Addendums: IRB approval must be sought and obtained for any proposed modification or addendum (e.g., a change in procedure, personnel, study location, study instruments) to the IRB approved protocol, and informed consent form before changes may be implemented, unless changes are necessary to eliminate apparent immediate hazards to participants. Changes to eliminate apparent immediate hazards must be reported promptly to the IRB.

Approval Expiration and Continuing Review: The PI is responsible for requesting continuing review in a timely manner and receiving continuing approval for the duration of the research with

human participants. Lapses in approval should be avoided to protect the welfare of enrolled participants. If approval expires, all research activities with human participants must cease.

Prompt Reporting of Events: Unanticipated Problems involving risks to participants or others; serious or continuing noncompliance with IRB requirements and determinations; and suspension or termination of IRB approval by an external entity, must be promptly reported to the IRB.

Closing a study: When research procedures with human subjects are completed, please log into our system at https://appstate.myresearchonline.org/irb/index_auth.cfm and complete the Request for Closure of IRB review form.

Websites:

1. PI responsibilities:

<http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI%20Responsibilities.pdf>

2. IRB forms: <http://researchprotections.appstate.edu/human-subjects/irb-forms>

CC:

Amanda Bianco

John Jameson, Psychology

Appendix B**Full Informed Consent****CALM WORKSHOP: EVALUATION AND INFORMED CONSENT**

Your feedback is important to us. The purpose of the research is to evaluate whether the CALM training has an effect on participants' knowledge or perceptions regarding suicide prevention interventions. We do not foresee obvious risks to you if you opt to participate beyond revealing your attitudes or beliefs about suicide prevention training programs. The benefits of participation are improving our generalized knowledge about suicide prevention programs but there will be no direct compensation given to you as a participant. Although completing the surveys will take approximately 2-4 minutes each (before, immediately after, and 1 month after the training), participation is voluntary, declining to participate will involve no penalty/loss of benefits, and you may discontinue participation at any time. You can attend the training without completing the surveys.

I prefer not to participate in the study

If you agree and sign below, you are providing your informed consent to participate in the study.

Signature: _____ Date: _____

We are asking for a mailing address so we can send you a follow-up evaluation form in one month.

Email address: _____

To ensure everyone's confidentiality, after you complete this form we will detach your name and email address from the completed surveys. Once you complete the email survey, we will shred the sheet containing your signature and email address. Do not write your name or initials on any pages other than the cover page.

Appalachian State University's Institutional Review Board has reviewed this study. Questions regarding the protection of human subjects may be addressed to the IRB Administrator, Research Protections, Appalachian State University, Boone, NC 28608 (828) 262-2692, irb@appstate.edu.

THANK YOU!

Appendix C

Suicide Prevention Training: Learning and Development Evaluation form

Evaluation (ASU Advisors T1)

<p>Suicide Prevention Training</p> <p>Learning & Development</p> <p>Evaluation Form</p>	<p>Age:</p> <p>Gender: M F</p> <p>Number of years as an Advisor:</p>				
<p>Have you previously received training in suicide prevention? Circle one: Yes No</p>					
<p>If yes, please provide details (name of course and date undertaken):</p>					
<p>Have you received any other relevant mental health training? Circle one: Yes No</p>					
<p>If yes, please provide an approximate number of hours of training:</p> <p>1. _____ 1 - 5 hours</p> <p>2. _____ 6 - 10 hours</p> <p>3. _____ 11 - 15 hours</p> <p>4. _____ 16 - 20 hours</p> <p>5. _____ 20 or more hours</p>					
<p>Please indicate how much you agree or disagree with each statement by checking the box provided</p>	<p>1 Strongly <u>Disagree</u></p>	<p>2 Disagree</p>	<p>3 Neither agree nor disagree</p>	<p>4 Agree</p>	<p>5 Strongly <u>Agree</u></p>
I feel I can accurately identify situations where a person is at risk of suicide					
I know how to approach and question people at risk of suicide					
I feel comfortable assessing someone for suicide risk					
I know how to refer people at risk of suicide to the services most appropriate to their needs and level of risk					
I am familiar with means restriction approaches to suicide prevention					
Suicide can be prevented by restricting access to lethal means					
I am confident in my ability to talk to people about reducing access to lethal means					

Table 1

Demographics: Age, Sex, and Number of Years as an Advisor

Demographics	<i>n</i>	Percent (%)
<i>Participant Age</i>		
26	1	6.25%
27	1	6.25%
28	1	6.25%
29	1	6.25%
31	1	6.25%
35	1	6.25%
43	1	6.25%
45	1	6.25%
49	3	18.75%
50	1	6.25%
52	1	6.25%
57	1	6.25%
61	1	6.25%
62	1	6.25%
<i>Participant Sex</i>		
Male	3	18.8%
Female	13	81.3%
<i>Years as an Advisor</i>		
.5	2	12.5%
1	1	6.25%
1.5	1	6.25%
2	3	18.75%
3	1	6.25%
5	2	12.5%
6	1	6.25%
7	1	6.25%
13	1	6.25%
16	1	6.25%
20	1	6.25%
32	1	6.25%

Table 2

Item Means and Standard Deviations

Items	Baseline (<i>n</i> = 16)	Post-Training (<i>n</i> = 16)	Follow-Up (<i>n</i> = 10)
<u>Suicide Prevention Items</u>			
“I feel I can accurately identify situations where a person is at risk of suicide.”	3.31 (1.01)	3.38 (1.02)	3.7 (1.15)
“I know how to approach and question people at risk of suicide.”	3.44 (.89)	3.81 (.66)	3.6 (1.17)
“I feel comfortable assessing someone for suicide risk.”	2.81 (.91)	3.25 (1.06)	3.1 (1.37)
“I know how to refer people at risk of suicide to the services most appropriate to their needs and level of risk.”	3.88 (1.02)	4.06 (.93)	4.2 (1.03)
<u>Means Reduction Composite</u>			
“I am familiar with means restriction approaches to suicide prevention.”	2.5 (.97)	4.19 (.40)	4.5 (.53)
“Suicide can be prevented by restricting access to lethal means.”	3.25 (1.06)	4.25 (.68)	4.3 (1.06)
“I am confident in my ability to talk to people about reducing access to lethal means.”	2.69 (1.01)	3.86 (.96)	4.2 (.92)

Note: All items were presented on a Likert Scale where higher scores were suggestive of more confidence (1 = Strongly Disagree, 5 = Strongly Agree)

Table 3

Paired Samples T-Tests

Composite	Interval Means (<i>SD</i>)		<i>p</i> *	Cohen's <i>d</i> **	95% CI
	<u>Baseline</u>	<u>Post-Training</u>			
Suicide Prevention	13.44 (3.08)	14.5 (3.16)	.042	0.339	-.358 – 1.038
Means Reduction	8.44 (2.28)	12.31 (1.66)	.000*	1.94	1.1 – 2.781
	<u>Post-Training</u>	<u>Follow-Up</u>			
Suicide Prevention	14.4 (3.92)	14.6 (4.33)	.825	.048	-.828 – .925
Means Reduction	12.5 (1.9)	13 (2.05)	.413	.253	-.627 – 1.133

Note: SD = Standard Deviation

*Significant levels based on Bonferroni corrections ($p \leq .0125$)

**Small effect size (.2), medium effect size (.5), large effect size (.8)

Figure 1

Composite Means for Change in Confidence Over Time (higher scores reflect more confidence)

