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Counseling on Access to Lethal Means (CALM): An Evaluation of a Suicide Prevention Means Restriction Training Program for Mental Health Providers

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Abstract:	<p>This paper evaluates the effectiveness of the Counseling on Access to Lethal Means (CALM) suicide prevention program. CALM trains mental health providers how to counsel suicidal individuals and those who support them on mean restriction during times of crisis. Pre/post/3-month follow-up assessments measured knowledge of lethal means, confidence and comfort in discussing means restriction (self-efficacy), and future intentions to counsel clients on means restriction. Change in the number of clients receiving lethal means counseling was also assessed. All constructs increased significantly at posttest. Confidence and counseling intentions were sustained at follow-up and significantly more clients received means counseling in the three months following the CALM training. Knowledge and comfort levels decreased at follow-up but not to pre-training levels. CALM is an effective means restriction training program. A template to assess clients for suicidality and lethal means access and booster sessions are recommended to further sustain effects.</p>	

TITLE PAGE

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Training Program for Mental Health Providers**

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4 **Counseling on Access to Lethal Means (CALM): An Evaluation of a Suicide Prevention Means Restriction**
5
6 **Training Program for Mental Health Providers**
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9

10 **ABSTRACT**

11
12 This paper evaluates the effectiveness of the Counseling on Access to Lethal Means (CALM) suicide prevention
13 program. CALM trains mental health providers how to counsel suicidal individuals and those who support them on
14 mean restriction during times of crisis. Pre/post/3-month follow-up assessments measured knowledge of lethal
15 means, confidence and comfort in discussing means restriction (self-efficacy), and future intentions to counsel
16 clients on means restriction. Change in the number of clients receiving lethal means counseling was also assessed.
17 All constructs increased significantly at posttest. Confidence and counseling intentions were sustained at follow-up
18 and significantly more clients received means counseling in the three months following the CALM training.
19 Knowledge and comfort levels decreased at follow-up but not to pre-training levels. CALM is an effective means
20 restriction training program. A template to assess clients for suicidality and lethal means access and booster sessions
21 are recommended to further sustain effects.
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32 **INTRODUCTION**

33
34 Suicide is a significant public health issue in the United States that profoundly affects individuals, families,
35 schools and communities. In 2014 it was the tenth leading cause of death and the number of deaths by suicide
36 (42,773) far exceeded the number of deaths from motor vehicle accidents (35,398) and homicide (15,809).
37 Furthermore, rates have been steadily increasing, rising from 11.06 per 100,000 in 2005 to 13.41 in 2014.
38 Importantly, a significant proportion of adults and youth have serious suicidal thoughts and behaviors. According
39 to the 2014 National Survey on Drug Use and Health (NSDUH), 3.9% of all adults 18 or older, or 9.4 million adults,
40 had seriously considered suicide in the past year, and 0.5%, or 1.1 million adults, attempted suicide. The problem is
41 more critical among youth. Responses to the 2013 Youth Risk Behavioral Surveillance System (YRBS) indicated
42 that 17% of high school students (2.7 million youth) considered suicide at least once in the year prior to the survey
43 and almost 8% (1.3 million youth) attempted suicide.
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55 In response to this critical public health issue, many programs have been developed that focus on
56 improving the mental health of suicidal individuals. This is particularly important given that almost 90% of
57 individuals who take their lives by suicide have been diagnosed with some type of mental illness (Arsenault-
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4 Lapierre, Kim & Turecki, 2004). Programs shown to effectively reduce suicidal thoughts and behaviors include
5
6 Attachment-Based Family Therapy (Diamond et al., 2002; Diamond et al., 2010), Dialectical Behavior Therapy
7
8 (Linehan et al., 1994; Safer, Telch & Agras, 2010), Dynamic Deconstructive Therapy (Gregory et al., 2008;
9
10 Gregory, DeLucia-Deranja, E., & Mogle, J.A., 2010), and Multi-Systemic Therapy with Psychiatric Supports (Huey
11
12 et al., 2004). Case manager follow-up after suicide attempts (Vergouwen et al., (2003) and pharmacotherapy
13
14 (Dolgin, 2012) have also been shown to reduce suicidal ideation and suicide (Walrath et al., 2015).

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16 Programs and policies restricting access to lethal means have also been shown to be effective in reducing
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18 suicides. More than half (51.5%) of suicides in the United States involve gun use (CDC, 2016), thus firearm
19
20 restriction efforts have been a major focus in the United States. Approaches have included locked firearm storage
21
22 and separate storage of ammunition and firearms (Miller, Azrael, & Hemenway, 2005), changes in firearm control
23
24 laws (Andres & Hemstead (2011); Bridges, 2004) and firearm buy-back programs (Chapman et al. 2015). Non-
25
26 firearm approaches have included restrictions on drug prescribing, packaging and purchasing (Crome, 1993;
27
28 Hawton, 2002; Lester, 1999; Nielsen & Nielsen, 1992; Turvill, Burroughs & Moore, 2000), detoxification of gas
29
30 (Kreitman, 1976; Lester, 1990), pesticide restriction programs (Bowles, 1995; Gunnell & Eddlestone, 2003),
31
32 catalytic converter mandates on motor vehicles (Mott et al., 2002) and construction of structural barriers to suicide
33
34 (Glasgow, 2011; Pirkis et al., 2013).

35
36 While laws and policies such as these have been shown to be highly correlated with reductions in suicide,
37
38 additional means restriction approaches, including implementation of evidence-based lethal means reduction
39
40 programs, are also warranted. However, though research supports the use of means restriction programs for suicide
41
42 prevention (Ajdacic-Gross et al., 2006; Johnson et al., 2011), programs directly addressing lethal means are limited.
43
44 Currently, the only lethal means restriction program listed on the SAMHSA or Suicide Prevention Resource Center
45
46 (SPRC) best practice registries is the Emergency Department Means Restriction Education Program for emergency
47
48 room personnel (Kruesi et al, 1999; Wisler et al, 1998).

49
50 In response to this need, approaches focusing on lethal means restriction are strongly supported in the 2012
51
52 National Strategy for Suicide Prevention (NSSP). Intended to set the direction for U.S. prevention initiatives, the
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54 NSSP calls for “efforts to reduce access to lethal means of suicide among individuals with identified suicide risk”
55
56 (NSSP, 43). Specifically, the NSSP strongly encourages professionals who provide services to people at risk of
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58 suicide to routinely assess for access to lethal means. Assessments by mental health professionals are particularly
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4 important, given that approximately 20% of individuals who take their lives have seen a mental health professional
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6 in the month prior to their suicide (Luoma, Martin & Pearson, 2002). Furthermore, according to Feldman &
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8 Freedenthal (2006), 87% of social workers had counseled a suicidal patient in a one-year period. Approximately
9
10 half of psychiatrists and psychiatry residents have experienced at least one patient suicide (Ruskin et al., 2004).
11
12 Among counselors, 71% have provided services to suicide attempters and 28% have had at least one client who took
13
14 their life during the course of therapy (Rogers et al., 2001). However, while mental health professionals may have
15
16 had general mental health training, they often lack adequate skills to specifically address lethal means restriction
17
18 (Bryan, Stone & Rudd, 2011; Schmitz et al., 2012).
19

20 The Counseling on Access to Lethal Means (CALM) is intended to fill this void. Developed by Elaine
21
22 Frank and Mark Ciocca at the Injury Prevention Center of the Children’s Hospital at Dartmouth, CALM was
23
24 designed specifically for mental health and crisis intervention professionals. Specifically, the program trains them
25
26 how to counsel their clients to reduce the availability of lethal means if they are at heightened risk for suicide.
27
28 CALM is currently listed on the Suicide Prevention Resource Center (SPRC) Best Practices Registry (BPR) under
29
30 Adherence to Standards, but is not considered to be an “evidence-based” practice due to limited studies of program
31
32 effectiveness. Only one outcome study, assessing implementation of CALM in New Hampshire, has been published
33
34 to date (Johnson, Frank, Ciocca & Barber, 2011). Using a posttest/follow-up design, that study showed evidence of
35
36 effectiveness in increasing counseling of clients’ parents about lethal means access, and improving attitudes, beliefs
37
38 and skills among training participants. This paper expands upon knowledge gained from that study using a
39
40 pretest/posttest/follow-up design to evaluate the effectiveness of CALM among Missouri mental health providers.
41

42 *The CALM Training Program*

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44 CALM trainings teach strategies to professionals to help them work effectively to reducing a suicidal
45
46 client’s access to lethal means in times of crisis. While CALM is intended to address the need to restrict access to
47
48 all types of lethal means, there is a particular focus on firearms given its lethality in suicide attempts. Specifically,
49
50 CALM workshop trainers inform participants about the prevalence of suicide and its warning signs, discuss different
51
52 types of lethal means, present examples of effective lethal means reduction efforts, and instruct the participants how
53
54 to most effectively work with individuals who are in immediate crisis and who possess firearms or other lethal
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56 means. The importance of addressing these issues with friends, family or others who have influence with the
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58 individual at risk and engaging their assistance is also stressed. CALM is not designed to discourage gun ownership
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4 or use, but to encourage temporary removal when individuals are at extreme risk of suicide. The 90- to 120 minute
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6 training program includes slides, a video, and role plays for professionals to practice their skills. The video
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8 demonstrates how a health professional might work with a family to persuade them to temporarily remove firearms
9
10 from the home because their adolescent son is contemplating suicide.

11 *CALM in Missouri*

12
13
14 In 2011, the Missouri Department of Mental Health (MDMH) was awarded a Substance Abuse and Mental
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16 Health Services Administration (SAMHSA) Garrett Lee Smith Youth Suicide Prevention Initiative grant. Through
17
18 grant funding, suicide prevention trainers offered free CALM trainings to mental health providers and other
19
20 professionals across the state, including emergency personnel and other first responders. Trainers were given the
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22 option of offering CALM by itself or in conjunction with Question, Persuade and Refer (QPR), a general suicide
23
24 prevention training program (Quinnett, 1995). While the majority of trainers provided the full 2-hour version of
25
26 CALM, one trainer also offered a 90-minute version that was preceded by QPR. This paper includes an analysis of
27
28 the effectiveness of the full version of CALM and the differential effectiveness of the full and the abbreviated
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30 version of CALM combined with QPR.

31 **METHODS**

32 *Procedures*

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36 The evaluation used a pre/post/3-month follow-up design with surveys completed by mental health
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38 professionals who participated in the CALM trainings. Because the number of other professionals trained was too
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40 small to allow for subgroup analysis, they were excluded from the evaluation. Participants completed paper/pencil
41
42 questionnaires at the beginning and the end of the training and were asked if they were willing, to provide e-mail
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44 addresses giving consent for the evaluators to follow up with an on-line survey three months later. For programs
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46 that included both QPR and CALM, pretests were administered after the completion of QPR, which always directly
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48 preceded the CALM program training.

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51 Each questionnaire took approximately five minutes to complete. Participants were asked to give the first
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53 and middle initial of their name and their birth month and day to allow researchers to link pretests, posttest and
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55 follow-up questionnaires. Participants were assured confidentiality and told that participation in the follow-up
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57 survey was voluntary and that they were not required to give their e-mail address. E-mail addresses, participant
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59 names and pre-post identification numbers were entered into Qualtrics, a web-based survey engine. A link to the
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4 three-month follow-up survey was sent via a personalized e-mail on the final day of the third month. A thank you e-
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6 mail message was sent to those completing the survey 30 days after the original invitation was sent. Two reminder
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8 emails were sent to those who did not respond to the first request. Additionally, paper copies were mailed to those
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10 who did not respond to the on-line survey. Of the 433 mental health professionals who completed pretests, 399
11
12 completed posttests, 222 provided e-mail addresses for follow-up and 73 responded to the follow-up survey.
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14 *Participants*

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16 Respondents who completed pre/post surveys (N=399) were mainly female (82.9%), white (94.0%) and
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18 slightly more than half (54.8%) were under 35. More than half (57.8%) had participated in a suicide prevention
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20 program in the past and around one quarter (25.9%) had participated in a suicide prevention program that included
21
22 information on lethal means restriction. Of those who completed three-month follow-up surveys (N=73), slightly
23
24 more were female (87.7%) and fewer were under 35 (45.1%). Also, slightly more (65.8%) had participated in a
25
26 suicide prevention program or a program including lethal means restriction information (31.5%). There were no
27
28 differences in racial composition between baseline and follow-up participants.
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30
31 Analyses were conducted to compare characteristics of those who completed the follow-up survey (N = 73)
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33 to those who completed pretest and posttests only (N = 399). Chi-square tests indicated no differences between
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35 those who completed a follow-up and the rest of the sample in regards to age, sex, race, or previous prevention
36
37 training. However, there were significant differences in the CALM+QPR and CALM-only groups who completed
38
39 follow-ups; 10.8% of the individuals in the CALM only group completed follow-ups compared to 26.6% of those in
40
41 the CALM+QPR group ($\chi^2(1, N = 407) = 4.07, p < .05$). Furthermore, since the CALM-only group was smaller than
42
43 the QPR+CALM group, only eight individuals from the CALM-only group completed the follow-up. Therefore, for
44
45 the comparison of CALM+QPR and CALM-only groups, we focused on the pre- and post- test comparisons only.
46
47 We then conducted a separate analysis with the entire combined sample to examine training effectiveness across
48
49 three time points. For both analyses, we used repeated measures analysis of covariance (RM-ANCOVA). All
50
51 pairwise comparisons used the Bonferroni correction to adjust for family-wise error rates.
52

53 *Measures*

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55 The survey included 31 items, with questions related to both suicide and lethal means restriction. Items
56
57 were clustered around four major domains: comfort in asking clients about suicidal thoughts and access to lethal
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59 means (3 items, $\alpha = .90$), counseling intentions (or likelihood of discussing means restriction and following up with
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4 clients) (4 items; $\alpha = .95$), knowledge related to suicide and means restriction (6 items, $\alpha = .64$), discussions with
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6 clients about suicide and lethal means (2 items) and self-efficacy (7 items). Self-efficacy included two distinct
7
8 constructs including provider confidence (5 items; $\alpha = .91$) and comfort level in discussing suicide and lethal means
9
10 restriction (2 items; $\alpha = .88$).

11
12 Self-efficacy and counseling intentions questions were modeled on those developed by the evaluation team
13
14 from a prior evaluation of gatekeeper training programs for the general public ($\alpha = .80$). Sample self-efficacy
15
16 questions included: “How comfortable are you talking to an individual about reducing their access to firearms?” and
17
18 “How confident are you that you can effectively talk to an individual about reducing their access to medicine and
19
20 chemical substances?” Sample counseling intentions questions included “If you recognize warning signs of suicide
21
22 in an individual, how likely are you to discuss methods of reducing their access to lethal means?” Response options
23
24 included extremely, very, somewhat, and not very, with extremely coded as 4 and not very coded as 1. Additionally,
25
26 both at pretest and follow-up, participants were asked how many of the individuals they had talked with in the past
27
28 three months exhibited suicide warning signs and how many individuals they talked with about restricting access to
29
30 lethal means. Responses were coded on a 7-point ordinal scale where 1 = 0 and 7 = 26 or more. Knowledge items
31
32 were based upon the CALM curriculum and the stated CALM objectives including questions such as: “What is the
33
34 most common means of suicide for adults?” and “What percent of people who survive a nearly lethal attempt go on
35
36 to die by suicide?” Responses were coded so that 1=Correct response and 0=Incorrect response. Participants were
37
38 also asked to indicate their age, gender, race, and occupation and whether they had participated in a suicide
39
40 prevention training and/or training on means restriction in the past.
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42
43 The evaluation of the effectiveness of CALM was approved by the University of Missouri-St. Louis
44
45 Institutional Review Board. There are no known conflicts of interest related to this research and all authors certify
46
47 responsibility for the manuscript.

48 49 **RESULTS**

50 51 *Pre/Post Comparisons (n=399).*

52
53 To assess the short-term effectiveness of CALM and compare the effectiveness of the full 2-hour version of CALM
54
55 to an abbreviated version combined with QPR, we conducted a 2 Time (Before CALM, After CALM) \times 2 Training
56
57 Type (CALM only, CALM+QPR) RM-ANCOVA controlling for whether the providers had previously participated
58
59 in a suicide prevention training. The sample size was 399.
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4 **Self-Efficacy.** For the confidence construct, there was a significant interaction ($F(1, 396) = 6.93, p < .01$),
5
6 indicating that from pretest to posttest, both those who received QPR+CALM and those who received CALM only
7
8 had significant gains in self-confidence in asking about lethal means ($p < .001$). The CALM-only group showed
9
10 greater gains in confidence after the training than the CALM+QPR group (see Figure 1). For the comfort construct,
11
12 there was a main effect of Time ($F(1, 394) = 131.01, p < .001$), indicating that both groups showed significant gains
13
14 in comfort as a result of the training. The interaction effect was not significant ($F(1, 394) = 1.06, p > .05$). Likewise,
15
16 counseling intentions showed a main effect of Time ($F(1, 392) = 76.78, p < .001$), indicating that counseling
17
18 intentions to discuss means restriction increased significantly after the training for both groups (see Figure 1). There
19
20 was no significant interaction effect ($F(1, 392) = .77, p > .05$).
21

22 **Knowledge.** There was a significant interaction effect for knowledge ($F(1, 392) = 12.67, p < .001$, partial
23
24 eta squared = .03), indicating that, while both groups showed significant increases in knowledge after the training (p
25
26 $< .001$), the CALM only group showed greater gains in knowledge after the training than the CALM + QPR group
27
28 (see Figure 1).
29

30 **Pre/Post/3-month Follow-up Comparisons (n=73)**

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32 To examine the effectiveness of CALM at 3-month follow-up, we conducted a three point-in- time (before
33
34 CALM, after CALM, 3-month follow-up) RM-ANCOVA controlling for previous suicide prevention training for the
35
36 self-efficacy and knowledge constructs. The sample size for this analysis was 73.
37

38 **Self-Efficacy.** For the confidence construct, there was a main effect of Time ($F(2, 71) = 31.45, p < .001$).
39
40 Pairwise comparisons indicated that while there were significant gains made from baseline to post-training ($p <$
41
42 $.001$), there was also significant loss from post-training to follow-up ($p < .001$; see Figure 2). Nonetheless, the data
43
44 still show a significant increase from the baseline to the follow-up ($p < .001$), suggesting that training gains in
45
46 confidence were diminished, but not completely lost during the follow-up period.
47

48 There was also a main effect of time for both comfort ($F(2, 142) = 9.57, p < .001$) and counseling
49
50 intentions ($F(2, 70) = 4.92, p < .05$). Pairwise comparisons indicated significant gains from before to after the
51
52 training for both variables (comfort: $p < .001$; counseling intentions: $p < .001$). The differences between post-
53
54 training and the 3-month follow-up were *not* significant, suggesting increases in comfort and counseling intentions
55
56 at posttest were maintained at the 3-month follow-up (see Figure 2).
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4 **Knowledge.** As with attitudes, knowledge scores indicated a main effect of time ($F(2, 70) = 26.41, p <$
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6 .001). However, while knowledge increased significantly from baseline to post-test ($p < .001$), knowledge also
7
8 decreased significantly from post-training to follow-up ($p < .001$). Indeed, knowledge scores at the follow-up were
9
10 not significantly different from those baseline ($p = .10$), indicating that gains in knowledge as a result of the training
11
12 were not sustained (see Figure 3).

13
14 **Behavior.** At baseline, 81% of CALM-trained mental health providers had previously spoken to one or
15
16 more clients about *suicidal thoughts and/or behaviors*. This increased to 84% at follow-up, but this difference was
17
18 not significant ($F(1,74) = .693, p = .41$). The percentage of providers who talked to clients about *reducing access to*
19
20 *lethal means* was 57%; considerably lower than the percentage who spoke to clients about suicidal ideation. This
21
22 increased to 74% at follow-up and this difference was significant ($F(1,73) = 7.65, p < .01$) (see Figure 4). Of those
23
24 who had received prior training in lethal means restriction, 77% had spoken to one or more clients about means
25
26 restriction at baseline. This increased to 86% at follow-up, but the difference was not statistically significant
27
28 ($F(1,20) = .656, p = .48$). Of those who had not received prior lethal means training, the percentage increased from
29
30 42% to 61% and this difference was significant ($F(1,42) = 9.67, p < .01$).

31 32 33 **DISCUSSION**

34
35 *Pre/Post Findings.* Analyses of responses from mental health professionals demonstrated short-term gains
36
37 in knowledge, self-efficacy and lethal means counseling intentions for both the QPR+CALM and the CALM-only
38
39 trainings. The longer CALM-only version was shown to be slightly more effective at increasing confidence in
40
41 discussing means restriction and teaching participants facts related to both suicide and lethal means. However, both
42
43 the CALM and CALM+QPR versions showed increases in comfort and counseling intentions. Overall these
44
45 findings suggest that both versions are effective in addressing means restriction. Use of the CALM-only version
46
47 may further strengthen program outcomes.

48
49 Open-ended responses regarding program effectiveness reflected these positive findings. Comments
50
51 included “CALM gave concrete examples of how to talk to someone on getting guns out of house,” “the program
52
53 cleared up some misconceptions I previously had,” and “CALM made me feel more comfortable talking with people
54
55 in crisis and gave me great resources to refer them to.” An updated video was the most requested program revision
56
57 mentioned.

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4 *Follow-Up Findings:* The use of a follow-up design allowed us to examine whether changes in comfort
5 and confidence levels, counseling intentions and knowledge were sustained over time. Our analysis showed that
6 with respect to *comfort*, statistically significant pre/post gains were sustained at three-month follow-up and suggest
7 that CALM can have lasting effects in making providers feel more comfortable when addressing suicide and lethal
8 means restriction with their clients. Similarly, *counseling intentions* increased significantly from pretest to posttest
9 and were sustained after three months. Taken together, these findings suggest that as providers become more
10 comfortable talking about lethal means restriction with their clients, they are more likely to ask clients direct
11 questions related to means restriction and more likely to follow up with their clients to explore whether their access
12 to lethal means has decreased, particularly during crisis situations when clients may be most vulnerable to suicide.
13
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15 *Confidence* also increased in the follow-up sample between pretest and posttest, but unlike comfort and
16 counseling intentions, levels dropped significantly from posttest to follow-up. However, follow-up confidence
17 levels were still significantly higher than those at baseline. A closer examination of baseline comfort and
18 confidence levels may help to explain the discordance between the findings for these two related concepts. For
19 example, among the several items related to comfort and confidence, the survey contained one comfort and one
20 confidence question specifically related to firearms restriction. Specifically, providers were asked, “How
21 comfortable are you talking to an individual about reducing their access to firearms” and “How confident are you
22 that you can effectively talk to an individual about reducing their access to firearms?” Nearly one-third (31.6%) of
23 providers at baseline felt extremely *comfortable* discussing lethal means with their clients but far fewer (12.7%) felt
24 extremely *confident* that could effectively discuss the topic. Additionally, the same pattern appears at follow-up.
25 While comfort and confidence levels both decreased, decreases in confidence were much more precipitous (and
26 statistically significant) compared to decreases in comfort which were not statistically significant. These findings
27 suggest that generally speaking, CALM makes providers feel more comfortable discussing difficult topics such as
28 suicide and means restriction but that additional efforts may be needed to boost their confidence.
29
30

31 Follow-up findings related to *knowledge* of suicide and lethal means restriction showed similar patterns to
32 those related to confidence. Knowledge increased significantly immediately after the training program but declined
33 three months later. However, unlike confidence, baseline and three-month differences in knowledge were not
34 statistically significant, suggesting that knowledge retention can be even more challenging than maintaining
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4 provider confidence. Again, booster sessions reinforcing the information gained during the training program may
5
6 help to maintain the positive immediate effects that occurred directly after the CALM training.
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9 Finally, we examined whether the CALM program had changed counseling *behaviors* both in terms of
10 suicidal ideation and means restriction. With respect to suicidal ideation, analysis of baseline responses indicated
11 that most providers (81%) had spoken to their clients about suicidal thoughts and/or behaviors prior to the CALM
12 training. Given that a majority of providers had already participated in suicide prevention training (62%), this
13 finding is not surprising but leaves little room for improvement. Indeed, while more providers (84%) did counsel
14 clients about suicidal ideation after three months, this increase was not significant. With this high base rate,
15 achieving statistical significance is challenging. Some providers may never change their counseling behaviors absent
16 a very intensive intervention, and all mental health providers do not necessarily have direct client contact. In this
17 sample of providers, six of the 79 providers (7.5%) had no client contact before or after CALM.
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28 Unlike the findings related to suicidal ideation, providers spoke with a significantly higher number of
29 clients about *means restriction* three months after the CALM training compared to the three months prior to the
30 CALM training. At baseline, 57% of providers had spoken to at least one individual about means restriction and this
31 rose to 77% at three-month follow-up. The increase occurred mainly among those who had never been exposed to
32 means restriction training. The discrepancy between these findings and those related to discussion about suicidal
33 ideation is most likely the result of a stronger emphasis in the CALM training on means restriction than suicidal
34 ideation. Additionally, fewer providers had received means restriction training than suicide prevention training
35 before the CALM training (29% compared to 62%) leaving more room for improvement. While these findings are
36 extremely encouraging, additional booster sessions may be warranted to further increase means restriction
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48 In sum, this analysis suggests that CALM is an effective lethal means restriction program for mental health
49 providers. Specifically, we demonstrated that CALM increased knowledge, comfort, confidence and likelihood of
50 follow-up discussions related to client access to lethal means. Further, CALM training increased the number of
51 clients with whom providers spoke about access to lethal means. While booster sessions are encouraged to further
52 educate and empower providers, our results support use of CALM to further educate and train mental health
53 providers to better serve their suicidal clients.
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Some study limitations warrant further research. First, as noted above, most providers who completed the follow-up survey had participated in the CALM+QPR version of the program, thus comparing long-term effects of CALM+QPR and CALM-only trainings was not possible. Second, use of a convenience sample and the lack of a comparison or control group limits the ability to assess whether findings were the result of CALM or exposure to other programming, though the authors are unaware of any means restriction training programs for mental health professionals and no such programs are on best practice lists. Next, study findings would be strengthened with a larger sample size, though the number of providers surveyed was sufficient to detect strong effects. Additionally, expanding the study pool to include first responders and other professionals who deal directly with suicidal clients will increase the ability to generalize findings to other populations. Finally, extending the follow-up time period beyond three months will allow for assessment of CALM’s long-term impact. Despite these limitations, our findings are extremely promising. CALM is an important suicide prevention program and should be considered by any mental health professional working with suicidal clients and their families.

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6 **REFERENCES**
7

- 8 Ajdacic-Gross, V., Killias, M., Hepp, U. et al. (2006). Changing times: A longitudinal analysis of international
9 firearm suicide data. *American Journal of Public Health, 96*, 1752–1755.
10
11 doi: 10.2105/AJPH.2005.075812
12
13
14 Andres, A. & Hempstead, K. (2011). Gun control and suicide: The impact of state firearm regulations in the United
15 States, 1995-2004. *Health Policy 101*(1), 95–103. DOI: 10.1016/j.healthpol.2010.10.005
16
17
18 Arsenault-Lapierre, G., Kim, C. & Turecki, G. (2004). Psychiatric diagnoses in 3275 suicides: a meta-analysis.
19
20 *BMC Psychiatry, 4*(37). Published online. doi: 10.1186/1471-244X-4-37.
21
22
23 Bowles, J. R. (1995). Suicide in Western Samoa: An example of a suicide prevention program in a developing
24 country. In R. F. W. Diekstra (Ed.), *Preventative strategies of suicide* (173–206). Leiden: E.J. Brill.
25
26
27 Bridges, F. S. (2004). Gun control law (Bill C-17), suicide, and homicide in Canada. *Psychology Reports, 94*, 819.
28
29
30 Bryan, C.J., Stone, S.L. & Rudd, M.D. (2011). A practical, evidence-based approach for means-restriction
31 counseling with suicidal patients. *Professional Psychology: Research and Practice, 42*(5), 339-346. Doi:
32 10.1037/a0025051.
33
34
35 Centers for Disease Control and Prevention. Fatal injury data (2015) Web-based Injury Statistics Query and
36 Reporting System. Retrieved from www.cdc.gov/injury/wisqars.
37
38
39 Chapman, S., Alpers, P., Agho, K., & Jones, M. (2015). Australia's 1996 gun law reforms: Faster falls in firearm
40 deaths, firearm suicides, and a decade without mass shootings. *Injury Prevention, 21*(5), 355-362.
41
42 doi:10.1136/injuryprev-2015-041832
43
44
45
46 Chemtob, C. M., Hamada, R. S., Bauer, G. et al. (1988). Patient suicide: Frequency and impact on psychologists.
47
48 *Professional Psychology, Research and Practice, 19*, 416–420.
49
50
51
52 Conwell Y. & Brent D. (1995) Suicide and aging: Patterns of psychiatric diagnosis. *International Psychogeriatrics,*
53 7(2), 149-64.
54
55
56 Crome P. (1993). The toxicity of drugs used for suicide (1993). *Acta Psychiatrica Scandinavica Supplement, 371*,
57 33-37.
58
59
60 Dolgin, E. (2012). The ultimate endpoint. *Nature Medicine, 18*(2), 190-193. doi:10.1038/nm0212-190
61
62
63
64
65

- 1
2
3
4 Florentine, J.B. & Crane, C. (2010). Suicide prevention by limiting access to methods: A review of theory and
5
6 practice. *Social Science and Medicine*, 70, 1626-1632. doi: 10.1016/j.socscimed.2010.01.029
7
- 8 Glasgow G. (2011). Do local landmark bridges increase the suicide rate? An alternative test of the likely effect of
9
10 means restriction at suicide-jumping sites. *Social Science & Medicine*, 72, 884-89. doi:
11
12 10.1016/j.socscimed.2011.01.001
13
- 14 Gunnell, D., & Eddleston, M. (2003). Suicide by intentional ingestion of pesticides: A continuing tragedy in
15
16 developing countries. *International Journal of Epidemiology*, 32, 902–909.
17
- 18 Hawton, K. (2007). Restricting access to methods of suicide: Rationale and evaluation of this [approach to](#)
19
20 [suicide prevention](#). *Crisis*, 28, 4-9. <http://dx.doi.org/10.1027/0227-5910.28.S1.4>
21
- 22 Hawton K. (2002). United Kingdom legislation on pack sizes of analgesics: Background, rationale, and effects on
23
24 suicide and deliberate self-harm. *Suicide and Life-Threatening Behavior*, 32, 223-229.
25
26 doi: 10.1521/suli.32.3.223.22169
27
- 28 Johnson, R.M., Frank, E.M., Ciocca, M. & Barber, C.W. (2011). Training mental health providers to reduce at-risk
29
30 patients' access to lethal means of suicide: Evaluation of the CALM Project. *Archives of Suicide Research*,
31
32 15(3), 259-264. doi: 10.1080/13811118.2011.589727
33
- 34
35 Kreitman, N. (1976). The coal gas story: UK suicide rates 1960–1971. *British Journal of Preventive and Social*
36
37 *Medicine*, 30, 86–93.
38
- 39 Kruesi, M. J., Grossman, J., Pennington, J. M. et al. (1999). Suicide and violence prevention: Parent education in the
40
41 emergency department. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38(3), 250-
42
43 255.
44
- 45 Lester, D. (1990). The effects of detoxification of domestic gas on suicide in the United States. *American Journal of*
46
47 *Public Health*, 80, 80–81.
48
- 49 Lester D. (1999) Effect of changing alcohol laws in Iceland on suicide rates. *Psychologica Republica*, 84(3),1158.
50
- 51 Ludwig, J., & Cook, P. J. (2000). Homicide and suicide rates associated with implementation of the Brady Handgun
52
53 Violence Prevention Act. *Journal of the American Medical Association*, 284, 585–591.
54
55 doi:10.1001/jama.284.5.585.
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 Luoma, J.B., Martin, C.E. & Pearson, J.L. (2002). Contact with mental and primary care providers before
5
6 suicide: A review of the evidence. *American Journal of Psychiatry*, 159, 909-916.
7
8 Mann, J.J., Apter, A., Bertolote J., et al. (2005). Suicide prevention strategies: A systematic review. *Journal of the*
9
10 *American Medical Association*, 294(16), 2064-2074. doi:10.1001/jama.294.16.2064.
11
12 Miller, M., Azrael, D. & Hemenway D. (2002). Household firearm ownership and suicide rates in the United States.
13
14 *Epidemiology* 13(5), 517-24.
15
16
17 Mott, J.A., Wolfe, M.I., Alverson, C.J., et al. (2002). National vehicle emissions policies and practices and declining
18
19 U.S. carbon monoxide-related mortality. *Journal of the American Medical Association*, 288, 988-995.
20
21 doi:10.1001/jama.288.8.988.
22
23 Nielsen, A.S. & Nielsen, B. (1992). Pattern of choice in preparation of attempted suicide by poisoning with
24
25 particular reference to changes in the pattern of prescriptions [in Dutch]. *Ugeskr Laeger*, 154, 1972-1976.
26
27 Pirkis, J., Spittal, M.J., Cox, G., et al. (2013). The effectiveness of structural interventions at suicide hotspots: A
28
29 meta-analysis. *International Journal of Epidemiology*, 42(2), 541-548. doi: 10.1093/ije/dyt021
30
31 Pope, K. S., & Tabachnick, B. G. (1993). Therapists' anger, hate, fear, and sexual feelings: National survey of
32
33 therapist responses, client characteristics, critical events, formal complaints, and training. *Professional*
34
35 *Psychology, Research and Practice*, 24, 142-152.
36
37 <http://dx.doi.org/10.1037/0735-7028.24.2.142>
38
39 Rogers, J.R., Gueulette, C.M., Abbey-Hines, J, Carney, J.V. & Werth, J.L. (2001). Rational Suicide: An empirical
40
41 investigation of counselor attitudes. *Journal of Counseling and Development* 79, 365-372.
42
43 DOI: 10.1002/j.1556-6676.2001.tb01982.x
44
45
46 Ruskin, R., Sakinofsky, I., Bagby, R.M., et al., (2004). Impact of patient suicide on psychiatrists and psychiatric
47
48 trainees. *Academic Psychiatry*, 28, 104-110. DOI: 10.1176/appi.ap.28.2.104.
49
50
51 Quinnett P. (1995). *QPR: Certified QPR Gatekeeper Instructors Training Manual*. Spokane, WA: The QPR
52
53 Institute.
54
55
56 Schmitz, W.M., Allen, M.H., Feldman, B.N., et al. (2012). Preventing suicide through improved training in suicide
57
58 risk assessment and care: An American Association of Suicidology task force report addressing
59
60
61
62
63
64
65

1
2
3
4 serious gaps in U.S. mental health training. *Suicide and Life Threatening Behaviors* 42, 292-304. DOI:
5
6 10.1111/j.1943-278X.2012.00090.x
7

8
9 Slovak, K., & Brewer, T. W. (2010). Suicide and firearms means restriction: Can training make a difference?
10
11 *Suicide and Life-Threatening Behavior*, 40, 63–73. DOI: 10.1521/suli.2010.40.1.63
12
13

14 Smith, Tom W., Michael Hout, and Peter V. Marsden. General Social Survey, 1972-2012 [Cumulative File].
15
16 ICPSR34802-v1. Storrs, CT: Roper Center for Public Opinion Research, University of Connecticut/Ann
17
18 Arbor, MI: Inter-university Consortium for Political and Social Research [distributors], 2013-09-11.
19
20 <http://doi.org/10.3886/ICPSR34802.v1>
21
22

23 Substance Abuse Mental Health Services Administration (2015). *National Registry of Effective Programs and*
24
25 *Practices*. Rockville: MD. Retrieved from www.nrepp.gov April 3, 2015.
26
27

28 Suicide Prevention Resource Center Best Practices Registry (2015). Retrieved from www.sprc.org April 3, 2015.
29
30

31 Turvill, J. L., Burroughs, A. K., & Moore, K. P. (2000). Change in occurrence of paracetamol overdose in UK
32
33 after introduction of blister packs. *Lancet*, 355, 2048–2049.
34
35

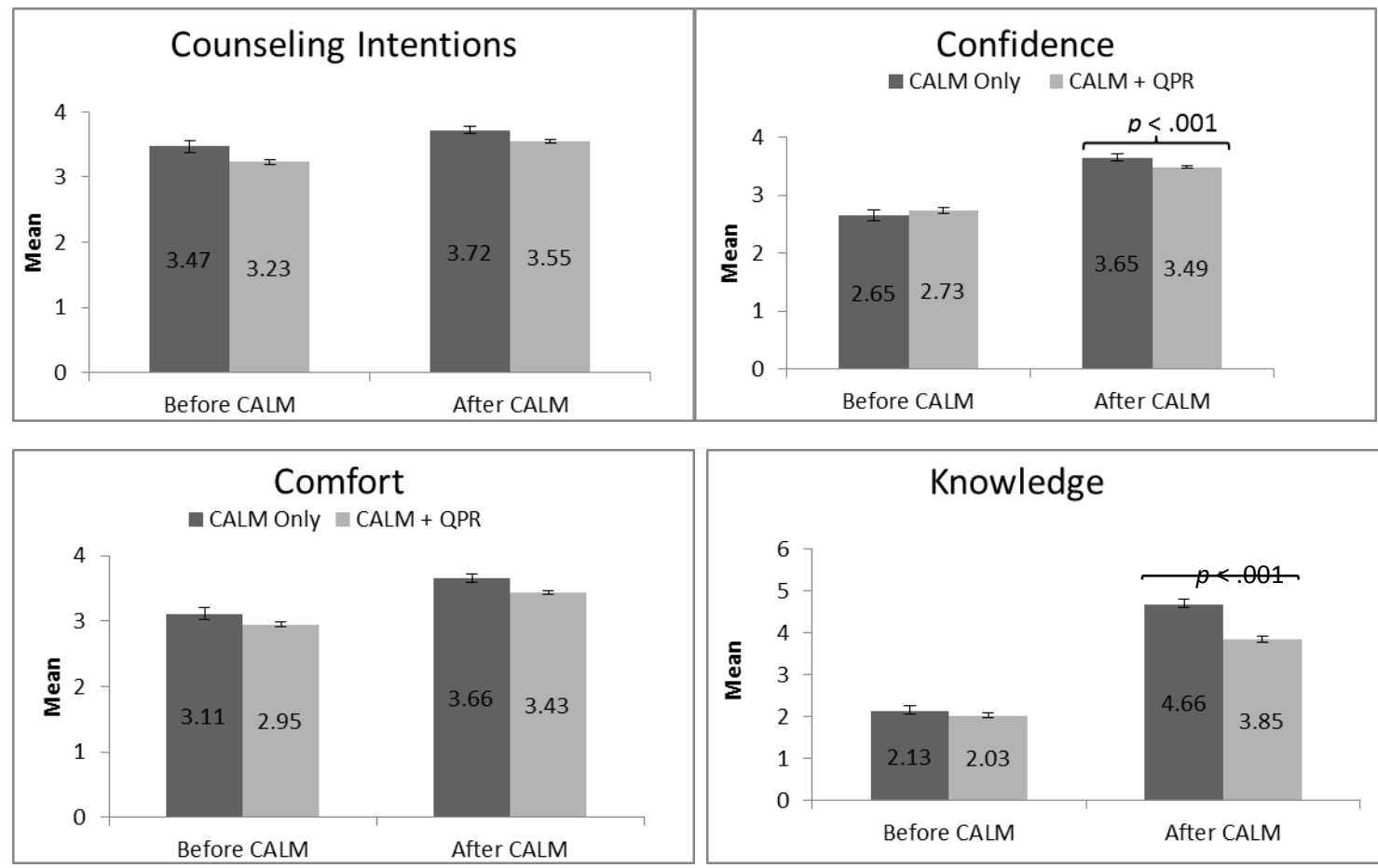
36 U.S. Department of Health and Human Services (HHS) Office of the Surgeon General and National Action Alliance
37
38 for Suicide Prevention (2012). *2012 National Strategy for Suicide Prevention: Goals and Objectives for*
39
40 *Action*. Washington D.C.: HHS.
41
42

43 U.S. Department of Transportation, National Highway Traffic Safety Administration National Center for
44
45 Statistics and Analysis (December 2012). *Traffic safety facts*, 1-6. Retrieved from [http://www-](http://www-nrd.nhtsa.dot.gov/Pubs/811700.pdf)
46
47 [nrd.nhtsa.dot.gov/Pubs/811700.pdf](http://www-nrd.nhtsa.dot.gov/Pubs/811700.pdf).
48
49

50 Vergouwen, A.C., Bakker A., Katon, W.J., Verheij, T.J., Koerselman, F. (2003). Improving adherence to
51
52 antidepressants: a systematic review of interventions. *Journal of Clinical Psychiatry*, 64,1415-1420.
53
54

55 Wislar, J. S., Grossman, J., Kruesi, M. J., et al. (1998). Youth suicide-related visits in an emergency department
56
57 serving rural counties: Implications for means restriction. *Archives of Suicide Research*, 4, 75-87.
58
59
60
61
62
63
64
65

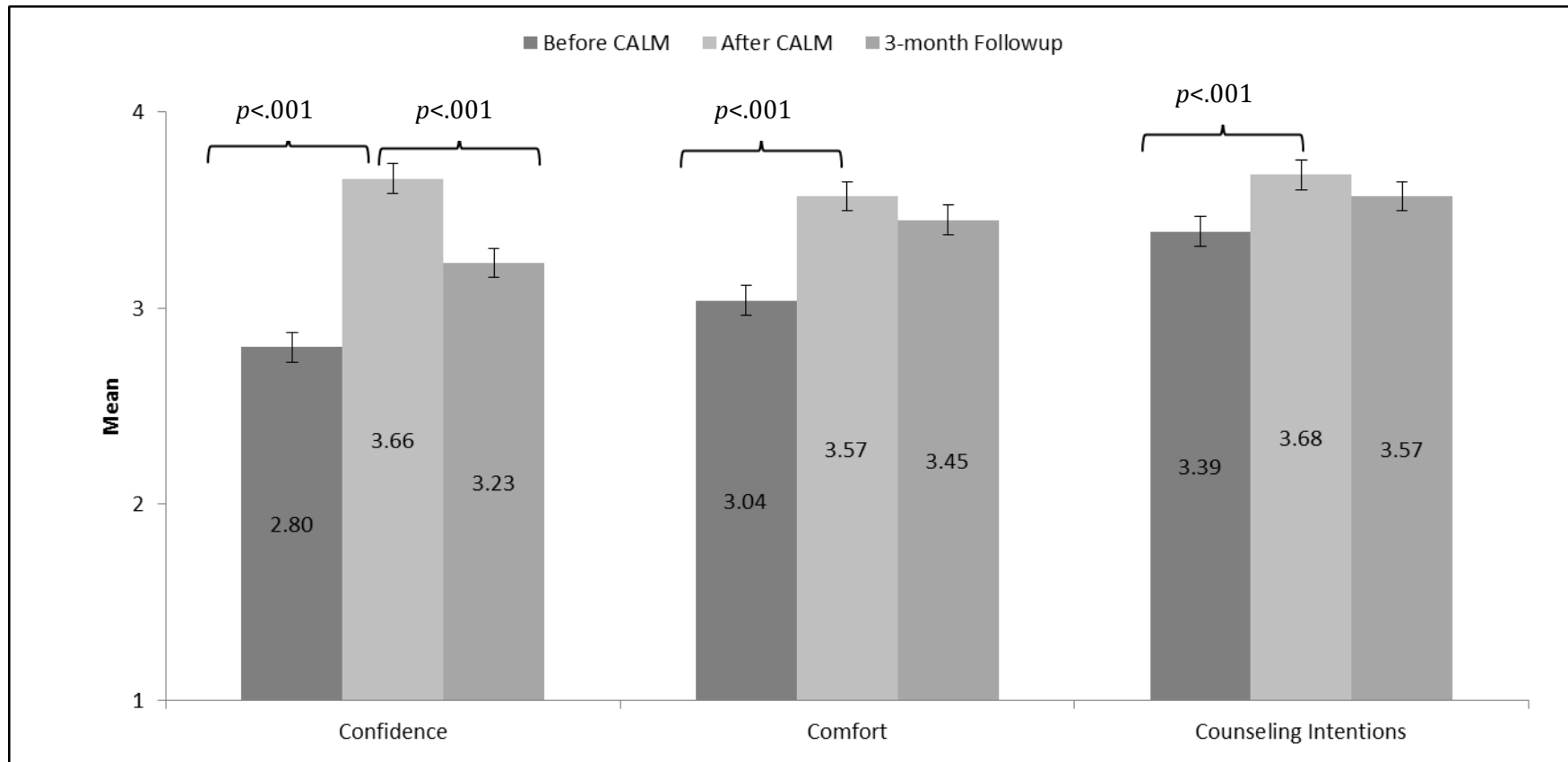
Figure 1. Comparison of CALM only and CALM+QPR groups in Confidence, Comfort, Counseling Intentions and Knowledge Before and After the CALM training (N = 399).



Note: Error bars represent standard error of the mean. All before and after training comparisons are significant at the $p < .05$ level.

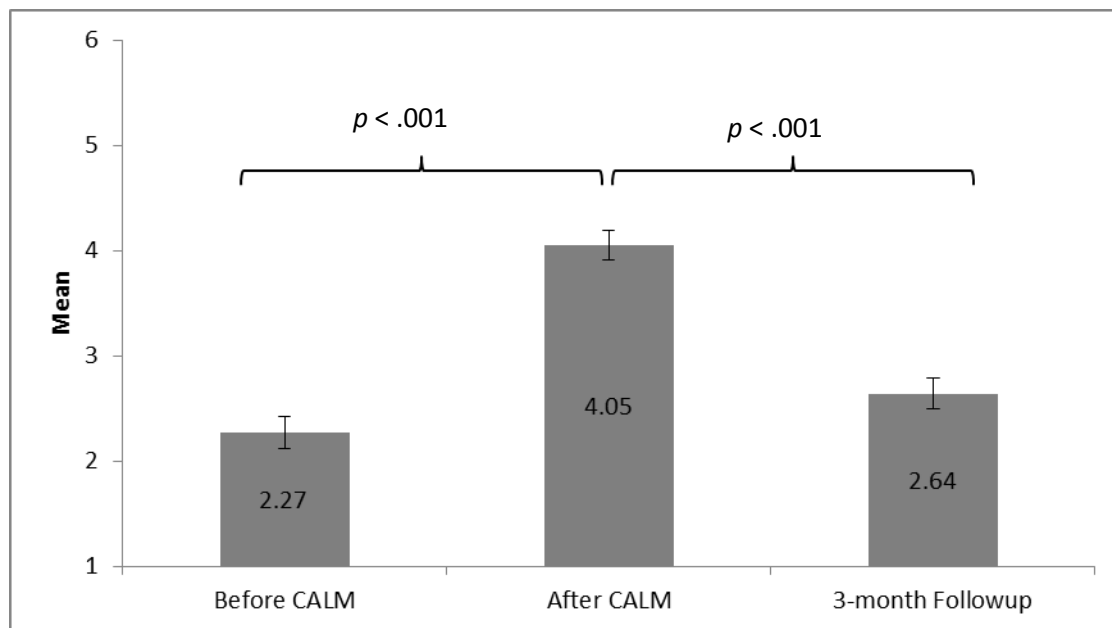
Figure 2

Figure 2. Effectiveness of CALM at the 3-month Follow-up: Confidence, Comfort and Counseling Intentions (N = 78)



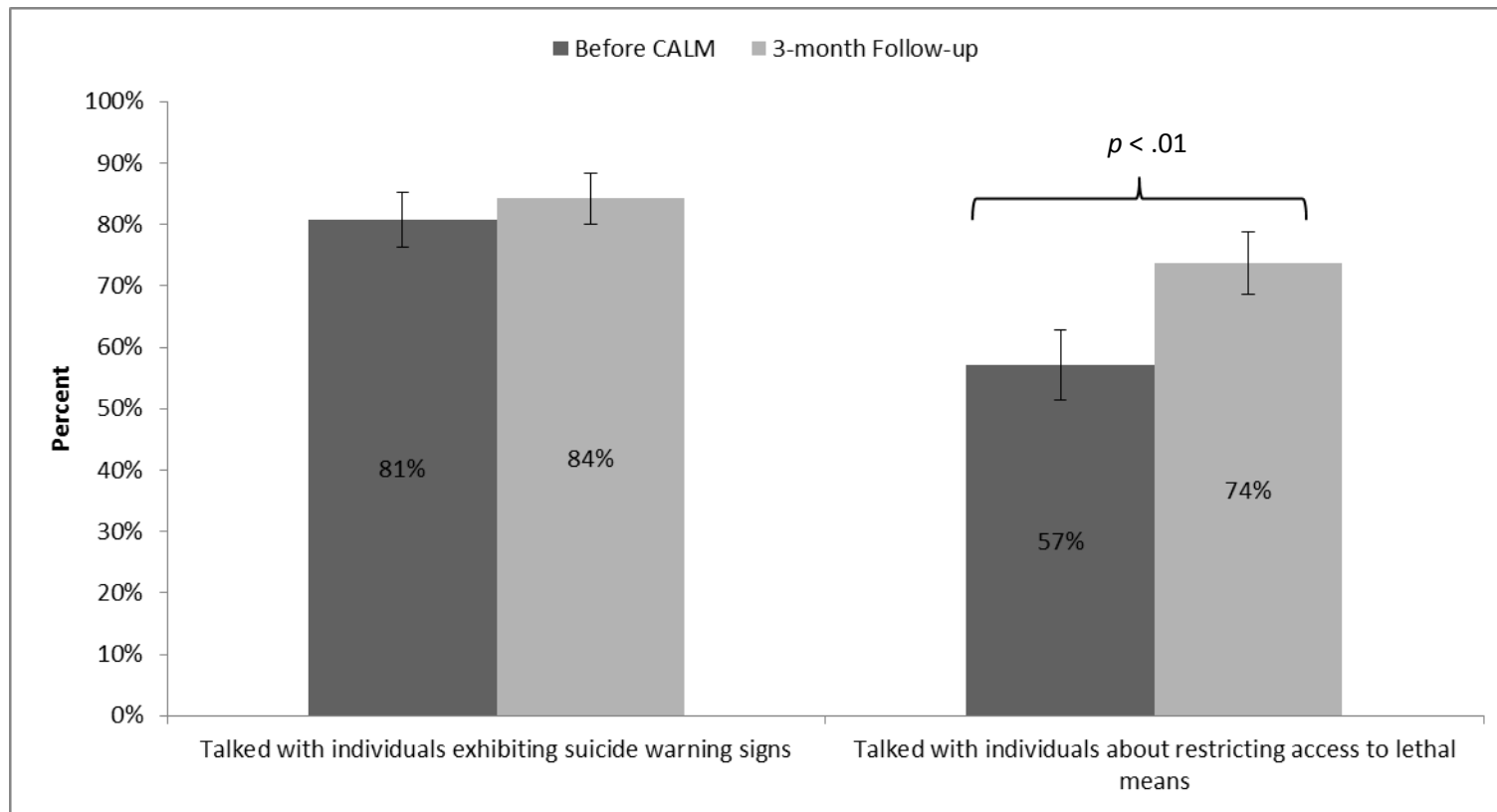
Note: Error bars represent standard error of the mean.

Figure 3. Effectiveness of CALM at the 3-month Follow-up: Knowledge (N = 78)



Note: Error bars represent standard error of the mean.

Figure 4. Effectiveness of CALM at the 3-month Follow-up: Behavior (N = 78)



Note: Error bars represent standard error of the proportion.