



Suicide Prevention for Athletic Staff: Evaluation of a Brief Suicide Prevention Gatekeeper Training for Athletics

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Suicide is an emerging concern for athletic communities at all levels, and more specifically for college-level student-athletes. This paper describes and evaluates VitalCog: Suicide Prevention for Athletic Staff, a 2-hour gatekeeper suicide prevention training program designed for broad athletic communities, with targeted utilization expected among collegiate programs. Participants were 244 attendees of a pilot program between May 26, 2022, and December 2, 2022. A mixed methods pre- and post-training intervention design with no control group was used and results suggest that participating in the program increased self-perceived knowledge about suicide prevention, confidence identifying risk factors, and comfort talking to others about suicide post-training. Participants had favorable ratings about the training overall, had high self-perceived ratings of behavioral intention, and indicated that they gained new skills, felt the training provided them with practical applications, and felt able to apply what they learned during the workshop. Preliminary 3-month follow-up evaluations are supportive for the maintenance of initial self-perceived knowledge, confidence, and comfort outcomes. The training workshop appears to not only increase participant knowledge but to also foster skills that may lead to participants being more likely to connect with others struggling with suicidal thoughts.

Keywords: suicide prevention, gatekeeper training, athletic staff

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Suicide was the 11th leading cause of death in the United States and the third leading cause of death for adolescents and young adults (15-24 years) in 2021 (Centers for Disease Control and Prevention, 2023). In 2022, 15% of college students reported having suicidal ideation (Healthy Minds Network, 2022). In addition, those aged 15-24 years saw the second largest increase in suicide rates between 2007 and 2020 (48%), followed by those aged 25 to 34 years (38%; CDC, 2023). Suicide is an emerging concern in athletic communities and is a leading cause of death for college athletes, accounting for approximately 7% of all National Collegiate Athletic Association (NCAA) athlete deaths (Rao et al., 2015). Death by suicide is just one measure of concern, as greater numbers of individuals experience suicidal ideation, or thoughts about and desire for suicide than die by or attempt suicide (Mortier et al., 2018). While the numbers suggest suicide is a public health concern, it is also deeply personal as every death has an impact on family, friends, teammates, coaches, other staff, and broader communities. This was highlighted in 2022 when at least five NCAA Division 1 student-athletes, representing multiple sports and diverse backgrounds, died by suicide in less than two months. This recent attention has personalized suicide and raises awareness of unique challenges faced by athletes (Menaker et al., 2023).

The NCAA and the National Association of Intercollegiate Athletics (NAIA) have responded to the increased focus on mental health among student-athletes. The NCAA's "Interassociation Consensus Document: Mental Health Best Practices Understanding and Supporting Student-Athlete Mental Wellness" provides recommendations for supporting and promoting student-athlete mental health. The recommendations include ensuring that coaches and faculty athletics representatives receive information annually about appropriate first response to emergency situations, signs, and symptoms of mental health disorders; how to encourage those facing mental health challenges to seek care; and how to make referrals (National Collegiate Athletic Association, 2020). The NAIA's "Mental Health Toolkit" is designed to be a resource for student-athletes, coaches, and administrators to help identify and understand resources available for managing mental health concerns among teammates and peers (National Association of Intercollegiate Athletics, 2023). Only about 10% of college athletes with known mental health conditions seek care from a mental health professional (American College of Sports Medicine, 2021), and athletic staff who have regular contact with athletes are often providing counseling and working outside of their training and competency (Anchuri et al., 2020; Moore, 2017; Moreland et al., 2018). A recent report found that 90% of athletic department staff want mental health training for coaches and directors (Mantra Health, 2022) so they are better equipped, as an example, to recognize signs of and know how to engage in conversations about suicidality.

Despite the increased focus, there is comparatively little data about suicidal ideation and behavior or suicide prevention strategies specific to athletics, potentially due to a lack of nuance about risk factors specific to athletes. The present program evaluates a gatekeeper suicide prevention training program known as *VitalCog: Suicide Prevention for Athletic Staff (VC Athletic Staff)* that was designed for athletic staff across a range of athletic programs and levels. Specifically, we evaluate whether athletic staff participants report greater perceived knowledge about suicide and suicide prevention and self-perceived competence helping someone who may be at risk following a 2-hour gatekeeper training compared to prior to the training. Preliminary data is provided examining the ongoing impacts of the training at 3-month follow-up. We further evaluate the program in the context of potential application across settings, including implementation and resource considerations. While *VC Athletic Staff* is applicable for and the

current data includes non-collegiate programs to demonstrate breadth, we anticipate targeted utilization by NCAA and NAIA programs and focus much of the literature and discussion on collegiate programs and student-athletes.

Suicide and Athletics

Research often shows that participation in athletics has a protective effect against suicide, particularly through the potential to develop social networks, the sense of belonging to a community, and through increased self-esteem, self-efficacy, and feelings of accomplishment (Anchuri et al., 2020; Dodd et al., 2021; Pichler et al., 2023). Pichler et al. (2023) conducted a literature review of 42 studies to evaluate the relationship between athletics participation and suicide, and found that, in general, rates of suicide and suicidality are lower among athletes or are comparable to other groups. Among NCAA athletes, the rates of suicide were estimated to be the second to fourth leading cause of death along with traumatic accidents, cardiovascular deaths, and homicide and were lower in comparison to the general population (Rao et al., 2015; Maron et al., 2014). Anchuri et al. (2020) conducted a longitudinal analysis of the National College Health Assessment (NCHA) survey and found that college athletes had lower rates of mental health symptoms and diagnoses in general, including suicide, than non-athletes. Lester (2017) analyzed combined data from 11 Youth Risk Behavioral Surveys of high school students (grades 9-12) and found that those participating in athletics reported less suicidal ideation in the prior year than their peers not engaging in athletics and fewer suicide attempts.

Others have suggested that the consensus that athletics serves as a protective factor against suicidality is not as clear and lacks a more nuanced understanding of the risk factors for and unique pressures on student-athletes (Dodd et al., 2021). As noted previously, death by suicide is just one factor of concern and a focus for prevention strategies is to better understand how risk factors may manifest into warning signs in athletic settings. For example, Rao (2021) has indicated that considering mental health as one risk factor rather than the sole direct cause of suicide is likely more appropriate for prevention strategies. The Interpersonal Psychological Theory of Suicidal Behavior (Interpersonal Theory; Joiner, 2007), which suggests that death by suicide is the result of both the desire for death (e.g., feeling like a burden and feeling like one doesn't belong) and the capability to enact lethal self-injury is, we believe, applicable to athletics and provides a grounding to evaluate the call for a more nuanced understanding of suicide among student-athletes. The Interpersonal Theory suggests that the desire for death or to end one's pain results from experiencing two psychological states: perceived burdensomeness (e.g., I am a burden, or I don't matter) and thwarted belongingness (e.g., I don't belong), along with a sense of hopelessness. While the combination of these factors may lead to ideation, a third factor known as capability for suicide (e.g., fearlessness about death and elevated pain tolerance) is required for an attempt to occur.

Dodd et al. (2021) examined the association between athletics participation and capability for suicide as theoretically grounded within the Interpersonal Theory. The authors evaluated pain tolerance, fearlessness about death, athletics participation, athletic-related injuries, level of contact, and weight manipulation practices among 153 undergraduate students. Their results suggest that athletes had higher levels of fearlessness about death and both subjective and objective pain tolerance than non-athletes. They also found that both injuries and level of physical contact are associated with higher fearlessness of death and injuries were related with higher subjective pain tolerance. Although suicidal ideation or attempts were not assessed, the findings suggest athletic-related injuries and contact are relevant risk factors for college athletes,

and that student-athletes may be more likely to progress from ideation to attempt due to increased capability.

One particular concern for student-athletes, that may further serve as an illustration for how the Interpersonal Theory affords for nuance, is the relationship between injuries and involuntary retirement with suicidal behaviors. Injuries, especially those that are serious, often force athletes to be removed from their sport, social connections, and daily routines (Putukian, 2016) and puts at risk an athlete's identity that is closely tied to sport. Student-athletes operate largely within homogenous social networks formed through participation in athletics, and disruption in networks is more widely associated with mental health concerns and suicide attempts among student-athletes than non-athletes (Anchuri et al., 2020; Chen et al., 2010; Miller & Kerr, 2003; Sarac et al., 2018). The application of the Interpersonal Theory may be seen through understanding how the more distal relationships between injuries and social network disruptions are risk factors as connected with the feeling that "I don't belong". Furthermore, injured athletes may feel like a burden to teammates, coaches, and fans, as well as to parents and other caregivers that may have expectations about continued participation in athletics. Leaving a sport, however, is not an absolute risk factor. Wolanin et al. (2015) conducted a review examining depression among athletes and found that ending one's athletic career voluntarily versus involuntarily may provide more protection against adverse effects, likely by allowing athletes to leave a sport on their terms without sudden social network disruptions or the feeling of being a burden to others. The Interpersonal Theory may suggest, again, that the distal connection of loss of network is a more important risk factor than the actual act of leaving a sport. While Lester (2017) found that participation in athletics appeared to be a protective factor overall against suicide, the reduction in suicidal ideation and attempts was not found for some ethnicities. Participation in athletics may be a risk factor when peer pressures associated with personal appearance and social interactions assume greater importance or by creating psychological distress, as related to the Interpersonal Theory's concept of thwarted belongingness.

Sleep disruption is another factor that may increase suicidal ideation among student-athletes. Stress can impact sleep and athletes face specific stressors such as academic demands, social obligations, scholarship concerns, eligibility, and injuries (Hwang and Choi, 2016) that may disrupt sleep patterns. Khader et al. (2020) evaluated whether sleep distress, onset insomnia, and insufficient sleep are associated with suicidal ideation using data from college students, including athletes, participating in the 2011-2014 NCHA. Each type of sleep disruption was significantly related to suicidal ideation, which is important to monitor as student-athletes regularly experience changes in and lack of sufficient sleep due to specific stressors that stem from feelings of being a burden or not belonging. Wiebenga et al. (2021) found that the association between sleep problems and suicidal ideation is stronger among athletes than non-athletes. The above factors represent some, but likely not all, of the ways that suicide risk may manifest differently for student-athletes. Training that addresses these specific nuances within a theoretical model is an important step to preventing both suicidal ideation and death by suicide among student-athletes.

Gatekeeper Suicide Prevention Training and Athletics

The term "gatekeeper" is often used to describe individuals who may serve as suicide protective factors by recognizing and connecting with individuals at risk for and displaying suicide warning signs (Burnette et al., 2015). Bowersox et al. (2021) note that some gatekeeper training programs are open to the public as part of campaigns analogous to training laypersons in

CPR, and outcomes overall are positive for improving skills and response confidence. Gatekeeper training programs have been shown to be efficacious as one component of a multi-faceted approach to suicide prevention that also includes reduced access to lethal means, responsible media reporting, community and other awareness campaigns, training of credentialed providers, mental health treatment, and follow-up with individuals after an attempt (Holmes et al., 2021). Athletic staff, including coaches, athletic trainers, and other staff that interact with athletes can impact team culture and how teams perceive and discuss suicide and promote help-seeking for those who might be struggling with suicidal ideation and can thus serve as suicide prevention gatekeepers by understanding risk factors, recognizing warning signs, developing shared language, engaging in discussions, and ultimately promoting approaches to help-seeking. However, there are few, if any, published data on national gatekeeper suicide prevention training programs specific for athletic staff. For example, a recent search of PsycInfo combining the terms “suicide,” “gatekeeper,” “athlete,” “athletics,” and “coaches” returned no results.

Despite limited research about gatekeeper training specific to athletics, there is research demonstrating the effectiveness of gatekeeper training in the general college population, and among managers (Goetzel et al., 2017), providing corollaries for student-athletes and athletic staff, respectively. Rosen et al. (2022) provided a gatekeeper version of Counseling on Access to Lethal Means (CALM) to 167 resident assistants (RAs) and found large training effects for suicide prevention and means reduction confidence levels at post-training, with a small decay of training outcomes at 6-week follow-up. Samuolis et al. (2020) evaluated a student-led model of Question, Persuade, and Refer (QPR) gatekeeper training and found that knowledge of suicide prevention, self-efficacy to intervene, and likelihood to intervene increased significantly from pre- to post-training. Rallis et al. (2018) developed a 1-hour manualized gatekeeper training based on Campus Connect and trained psychology doctoral students to deliver the program to 231 mostly undergraduate students. Results show that both declarative and perceived knowledge increased significantly pre- to post-training, with some decay at 3-month follow-up. Another interesting finding was that while the number of students thinking about suicide identified did not increase, the number of referrals did in the amount of about 1 referral per 6 students trained.

Workplace suicide prevention programs show benefit in terms of increasing knowledge about suicide and changing positive attitudes about one’s ability to help others with suicidal thoughts (Milner et al., 2015), and increased comfort level with talking about both suicide and mental health (Cross et al., 2007). Gayed et al. (2019) performed a meta-analysis on the efficacy of workplace mental health training interventions for managers and found that managers benefit from specialized, evidence-based training interventions that need not be long or intensive to show impact. Schwarz et al. (2019) found that a one-day manager training on mental health can have long-term improvement in areas such as stigma-related knowledge of mental health, and Milligan-Saville et al. (2017) showed that a 4-hour training had longer-term impact on managers’ confidence and behavior dealing with mental health and led to a reduction in sickness absence.

Despite encouraging evidence there remains limited information about how best to deliver gatekeeper training (O’Brien et al., 2022); although some guiding principles are emerging. Holmes et al. (2021) conducted a systemic review of the long-term efficacy of gatekeeper training and found that outcomes can decline over time as trained individuals may not have opportunities to utilize their learned skills. This may suggest that one-time gatekeeper training is necessary, but booster or refresher training may be required, as may increasing the depth of role play activities during training as suggested by Kuhlman et al. (2021). Hawgood et al. (2022) conducted a review of gatekeeper training programs, and to promote consistency of implementation, they propose a minimum set of gatekeeper training competency categories: knowledge, skills and abilities, attitudes, and self-efficacy. Plos et al. (2021) recommend a five-

step model for integrating suicide prevention gatekeeper training into athletic training curriculum: 1) assess campus and student-athlete culture, 2) assess resources, 3) select a gatekeeper training program, 4) prepare the campus for gatekeeper training, and 5) establish and evaluate program goals. Menon et al. (2018) suggest that gatekeeper training should include early warning signs of suicide risk, how to approach and broach the topic of suicide, psychological first aid, and basic postvention activities; should be provided periodically; and should cover knowledge of at-risk populations and referral strategies. Finally, Shtivelband et al. (2015) sought to better understand what might help with longer-term maintenance of training effects and suggest seven themes: 1) social connections with other gatekeepers, 2) continued education, 3) community outreach and awareness, 4) accessibility, 5) ongoing communication, 6) continuous training improvement, and 7) certification process.

Development of a Gatekeeper Training for Athletic Staff

By emphasizing connections and promoting meaning, athletic staff can act as a first line of defense (i.e., gatekeepers) for athletes and other staff struggling with suicidal thoughts. Although there is limited evidence for the application of the Interpersonal Theory to athletic settings, there is some evidence from specific industries, including construction and first responders, to suggest more generalized validity in work settings (Mishkind et al., 2023; O'Brien et al., 2022). The Interpersonal Theory appears to allow for much of the added nuance of suicidality and resulting prevention strategies that are needed in athletics and therefore is a cornerstone of the current training program, *VC Athletic Staff*. Risk factors as conceptualized within the Interpersonal Theory and as they manifest within athletic communities were incorporated into development of the program. This includes modifications to the training videos and workbooks to highlight factors such as, but not limited to, injuries, receiving official disciplinary actions, sleep, chronic pain, and the role of a student-athlete (e.g., social media bullying). Interactive training exercises were also adapted to encourage participants to consider how various factors both manifest in athletic environments and fit within the context of the Interpersonal Theory. Another cornerstone of the current training program is the use of a community engagement framework, which recognizes that each community has its own culture and norms, and that health improvement can be led by lay members or through partnerships with professionals (Clinical and Translational Science Awards Consortium & Community Engagement Key Function Committee Task Force on the Principles of Community Engagement, 2011). Finally, the current program utilizes many of the suggested best practices, including role play activities, certifications, and a wholistic prevention approach.

Materials and Methods

Overview of the “VitalCog: Suicide Prevention for Athletic Staff” Program

VC Athletic Staff was designed to be a practical, brief (i.e., 90 to 120 minutes), and user-friendly suicide prevention gatekeeper training for the full range of athletic staff (e.g., staff directly engaged with student-athletes). It is based on *VitalCog*, which is a 2-hour training that promotes awareness of the critical need for suicide prevention in work and other organizational settings (Mishkind et al., 2023). The *VitalCog* program is currently owned and managed by the Johnson Depression Center (JDC), Department of Psychiatry, School of Medicine, Anschutz Medical Campus. All authors worked for the Anschutz Medical Campus during the pilot and evaluation period, with authors 1, 2, 4, and 6, working directly for the JDC. Authors 3 and 5 do

not work for JDC and served as independent internal data analysis consultants for the current project.

A team of subject matter experts including the authors, athletic staff, mental health professionals, and athletes worked collaboratively to modify the original *VitalCog* material to meet the goals of *VC Athletic Staff*, with specific focus on highlighting how specific risk factors manifest in athletic environments and are contextualized within the Interpersonal Theory. The training is designed to raise awareness about suicide prevention in athletics, help coaches, athletic trainers, and other athletic staff develop practical skills to assist those at risk, and to emphasize that anyone, regardless of role or position, can help prevent suicide. It should be noted that while the content is focused on suicide and crisis intervention, much of it can be generalized to non-crisis situations. Furthermore, the training is applicable to assisting both athletes and other athletic staff.

VC Athletic Staff is composed of three chapters: 1) Pre-Game, 2) Get in the Game, and 3) Change the Game, each with a video, trainer-led didactic section, a workbook section, and interactive exercises. The training is delivered synchronously (e.g., real-time) by a certified instructor and can be conducted virtually or in-person. An evaluation of *VitalCog* found that delivering the training virtually is as effective as in-person (Mishkind et al., 2023). All trainers participate in an 8-hour train-the-trainer session and meet with a master trainer before receiving full certification to conduct training. Trainers are also provided access to continuing education.

Chapter One (Pre-Game) gives an overview of why it is important to take active measures to prevent suicide in athletics. It provides information about suicide rates and risks, discusses the importance of addressing emotional and mental well-being of athletes, former athletes, and staff to foster connections, and highlights the role that mental health has on engagement, performance, sustainability, and success. Chapter One also highlights the importance of language that focuses on suicide to describe the act or type of death and not on the person. The Pre-Game video introduces four steps that athletic staff can take to help build safety nets and protective factors: promote communication, build resiliency, foster connection, and practice empathy with accountability. Pre-Game ends with a discussion about how these steps can be implemented in the athletic environment.

Chapter Two (Get in the Game) is designed to teach participants about risk factors and warning signs of someone who may be thinking about suicide and what to do when one is concerned. Get in the Game introduces the Interpersonal Theory (Joiner, 2007) both as presented by the trainer and in the respective video. The Interpersonal Theory is initially incorporated through a visual presentation and description of the model in both the video and the participant workbook, with an additional overview provided by the instructor on how specific risk factors may manifest in athletic environments. For example, there is discussion about how physical injuries may manifest as psychosocial risk factors within the concepts of “I am a burden” and “I am alone”. Get in the Game ends with a discussion about how the concepts “I am a burden”, “I am alone”, and “I can” may manifest in the athletic environment. The intent of Chapter Two is to highlight how distal factors may be risks for suicidality and to promote thinking beyond what may be considered more typical risk factors. For example, there is discussion about how receiving an official disciplinary action may lead to concerns about dismissal from a team and subsequently thoughts about losing social connections and being a burden to others during the process. “I can” may then also be discussed within the context of lowered inhibitions, and heightened fearlessness about death and pain tolerance.

Chapter Three (Change the Game) is focused on providing participants with tools to talk with someone who might be at risk. The gatekeeper role is reinforced as the tools are intended to help navigate conversations and promote help-seeking behaviors and are not designed to provide

depth about longer-term treatments. The goal of Change the Game is to give participants a level of confidence to understand risk factors and to have conversations with someone whom they might be concerned about, with the primary themes of empathy, active listening, and direct communication. Change the Game includes a video providing examples of these themes and participants do a role play exercise designed to increase comfort levels with asking the direct question, “Are you thinking about suicide,” or “Are you thinking about killing yourself”. The primary goal of Chapter Three is the focus on steps to help someone and the understanding that asking direct questions about suicide is critical. Engagement in role play activities is very important for Chapter Three.

Participants

Participants were 244 attendees of the *VC Athletic Staff* pilot program between May 26, 2022, and December 2, 2022, who also had matched pre- and post-training evaluation responses. Participant demographics can be found in Table 1. Approximately 375 athletic staff participated across 9 pilot sessions (authors 1 and 4 conducted all training sessions); however, some attendees did not complete sign-in sheets or the pre-training evaluation, and the exact number is uncertain. All trainings were conducted synchronously (conducted real-time with a trainer), with 43% of respondents participating virtually. There were 351 unique pre-training evaluations and 304 unique post-training evaluations. Matched samples were limited to those completing both evaluations, with matching personally developed identification codes for a total of 244 matched samples. Participants were offered the opportunity to attend a *VC Athletic Staff* training by their respective athletics department or organization, each with its own process for announcing the training. Four NCAA programs at the Division 1 level in Colorado, Arizona, California, and Illinois are represented, with over 80% of respondents working with athletes at the collegiate level. Two additional non-collegiate programs (one a non-profit organization for recreational and competitive figure skating and ice hockey coaches in Nevada and one non-profit suicide prevention organization in Texas that hosted a training for youth, middle, and high school athletic staff) are also represented. As a pilot program, study staff primarily reached out to potential programs through professional networks. Contacts at three of the NCAA programs were identified through their respective athletic department’s mental health team, and study staff reached out with a request to participate in the pilot. One NCAA program was contacted by the study staff through a professor in the athletic training program. The organizations in Nevada and Texas requested the training through professional networks, and study staff reached out in response to the request. All participating programs were offered the training at no cost and no obligation. Participants were encouraged, but not mandated, to complete the evaluations to inform the pilot program.

Demographics collected showed that most respondents were White, just over half of respondents identified as female, the most common age selected was 25 to 35 years, and almost all respondents had a college or professional degree. Just over 80% of participants worked with athletes at the collegiate level. About three-quarters of respondents worked solely with athletes in a competitive environment, 12% worked with athletes only in a recreational environment, and 11% worked with athletes in both competitive and recreational environments. Athletic staff working with over 14 sports were represented, with about 53% involved with more than one sport. Athletic staff position such as coach or athletic trainer was not collected.

Table 1
Demographic Characteristics Overall

Characteristic	N = 244* (%)
Age, years	
<25	30 (12.4)
25-35	108 (44.8)
36-45	48 (19.9)
46-55	35 (14.5)
56-65	16 (6.6)
>66	4 (1.7)
Prefer Not to Answer	3
Gender	
Female	123 (50.8)
Male/Trans Male	119 (49.2)
Prefer Not to Answer	2
Race	
American Indian/Alaskan Native	2 (1.0)
Asian/Asian American	7 (3.4)
Black/African American	22 (10.6)
White/Caucasian	170 (81.7)
More than one race	5 (2.4)
Other	2 (1.0)
Prefer Not to Answer	36
Hispanic/Latino/a/x	44 (18.0)
Education	
Some High School or High School Grad	5 (2.1)
Some College	6 (2.5)
Trade/Technical/Vocational Training	9 (3.7)
College Degree	95 (39.3)
Professional/Advanced Degree	127 (52.5)
No Response	2
Athlete Type	
Youth	17 (7.2)
Middle School	7 (2.9)
High School	16 (6.8)
College	192 (81.4)
Post-College/Professional	1 (0.4)
Other	3 (1.3)
No Response	8

* Percent calculations are based on the total number of responses per category.

Evaluation Measures

A pre-, post-, and follow-up questionnaire was developed by the training team to evaluate general self-perceived competency as measured by knowledge, confidence, and comfort level domains of suicide prevention before and after completing the *VC Athletic Staff* training. Quantitative methods focused primarily on self-reported competency addressing suicide in athletics using Likert-type items with a 1 to 5 scale from strongly disagree to strongly agree, in which 5 indicated greater levels of knowledge or comfort. Eight (8) items were matched pre- to post-training: 1) *I believe suicide prevention can benefit athletic staff*, 2) *I can identify suicide protective factors (e.g., safety nets)*, 3) *I can identify the risk factors and warning signs of suicide*, 4) *I understand a suicide risk model (e.g., Joiner model)*, 5) *I feel comfortable talking to someone about getting help*, 6) *I know what resources to offer someone who may be thinking about suicide*, 7) *I feel comfortable talking to someone about suicide and suicide prevention*, and 8) *Overall, I feel knowledgeable about suicide prevention*. The questionnaire had very good to excellent internal consistency. Cronbach's alpha for the eight items across both pre- and post-assessments was .89 with a slightly higher reliability for post-training ($\alpha = .91$) than pre-training ($\alpha = .88$). The follow-up questionnaire was not included in the internal consistency analysis as only preliminary follow-up results are presented in this paper.

Additional items that were evaluated only post-training focused on trainer effectiveness, overall effectiveness of the training, evaluation of the training components, knowledge gained, and respondent intent to utilize new skills and information. The questionnaire also included open-ended questions asking participants to comment on what they learned, what they wished they would have learned, and what other comments they had regarding the training. The follow-up questionnaire included items related to whether participants had used any knowledge or skills from the training, whether they had spoken to others about the training, encountered someone who may have had thoughts of suicide, and self-perceived behavioral intent.

Design and Statistical Analyses

We had three main project proposals: 1) Self-perceived suicide prevention knowledge, confidence, and comfort would increase significantly post-training, 2) Trainer effectiveness and post-training perceived application of skills would be higher, and 3) Self-perceived suicide prevention knowledge, confidence, and comfort would show decay at follow-up.

A mixed methods pre- and post-training intervention design with no control group was used to evaluate the *VC Athletic Staff* training program. Participants were provided with physical copies of the training workbook and asked to complete the pre-training questionnaire immediately prior to the start of the training (accessed via QR Code or hyperlink). They were then provided with another link immediately post-training and asked to complete the questionnaire before leaving. Participants were asked to create a non-identifying, self-created identification code to input in both the pre- and post-training evaluations to allow for matched pairs analyses. A follow-up link was sent via email three months after completion of the training to participants that provided a valid email address. This is a program evaluation project that does not meet the definition of research and the Colorado Multiple Institutional Review Board determined that this project is not human subject research (COMIRB #21-4859).

Descriptive statistics and frequency distributions were generated for participant characteristics. We calculated mean composite scores for all 8 items in perceived general suicide prevention knowledge. Composite scores ranged from 1 to 5, where higher indicated greater levels of knowledge or comfort. Matched t-tests assessed pre-post differences in composite

scores and specific items. Analyses with p -values < 0.05 were considered statistically significant and were conducted using SPSS statistical software (v26.0; IBM Corporation, Armonk, NY).

We also conducted a brief thematic analysis of qualitative responses to three general items as part of the post-evaluation survey: 1) *What are the top two things you learned during this training?* 2) *Please list one or two topics you would like to have learned more about,* and 3) *Please provide any additional comments.* Deductive and Inductive thematic analysis methods were used to identify recurrent topics. Prior to initial coding, the research team developed a codebook based on the qualitative questions and training content. Two authors (MM and TM) then independently reviewed all comments and assigned each comment to its appropriate code(s). The authors then met to discuss their respective code assignments and agreed to a final list of coded themes. Comments were reviewed a final time, and codes were scored as a positive check when indicated. Each comment may be associated with multiple codes/topics. The number of times each code/topic was mentioned for each of the three qualitative questions were then tallied to determine the most common recurrent topics mentioned by participants.

Results

Pre- and Post-Training Perceived Suicide Prevention Knowledge, Confidence, and Comfort

We examined frequency of responses on the eight matched evaluation items assessing participants' self-reported knowledge about, confidence discussing, and comfort with suicide prevention topics and performed matched t -tests to compare individual pre- and post-training mean scores. Participants attending a *VC Athletic Staff* pilot training with matched pre- and post-training questionnaires demonstrated a significant pre- to post-training increase for each of the 8 self-perceived knowledge, confidence, and comfort items (all at $p \leq .003$). A composite score of all 8 items in perceived general suicide prevention knowledge from pre- ($M = 3.68$, $SD = .65$) to post-training ($M = 4.46$, $SD = .46$) showed a significant increase, $t(241) = -22.85$, $p < .001$. For specific items, participants increased their belief that suicide prevention can benefit athletic staff, $t(239) = -3.00$, $p = .003$. Participants' perceived ability to identify suicide protective factors, $t(240) = -16.50$, $p < .001$, and risk factors and warning signs, $t(240) = -15.20$, $p < .001$, increased. Participants' perceived comfort talking to someone about getting help, $t(240) = -7.02$, $p < .001$, and suicide and suicide prevention, $t(238) = -10.98$, $p < .001$, also increased significantly. Finally, Participants also showed significant increases in their perceived understanding of a suicide risk model, $t(239) = -24.82$, $p < .001$, perceived knowledge of resources to offer someone, $t(237) = -14.64$, $p < .001$, and overall perceived knowledge about suicide prevention, $t(238) = -19.69$, $p < .001$. See Table 2 for pre- and post-training evaluation mean response scores and standard deviations.

Trainer Effectiveness and Post-Training Perceived Application of Skills

Participants responded to five items about trainer effectiveness, all receiving mean effectiveness scores above 4.75 (see Table 3). Eight additional items were provided post-training only to assess whether the training impacted perceptions of broader knowledge gain and perceived potential for behavior change. The composite score for the eight items was slightly in the strongly agree range ($M = 4.53$, $SD = .50$). The highest rating was for the item *Training showed me how to get help for someone thinking about suicide* ($M = 4.62$, $SD = .51$), followed

Table 2
Knowledge and Comfort Pre-Post Results (N=244)

<i>Evaluation Item</i>	<i>Pre</i>	<i>Post</i>	<i>SD</i>	<i>p</i>
Believe suicide prevention can benefit athletic staff	4.71	4.81	0.52	.003
Can identify suicide protective factors (e.g., safety nets)	3.61	4.43	0.77	<.001
Can identify the risk factors and warning signs of suicide	3.67	4.40	0.74	<.001
Understand a suicide risk model (e.g., Joiner model)	2.75	4.46	1.07	<.001
Feel comfortable talking to someone about getting help	3.98	4.33	0.77	<.001
Know what resources to offer someone who may be thinking about suicide	3.68	4.58	0.95	<.001
Feel comfortable talking to someone about suicide and suicide prevention	3.64	4.23	0.83	<.001
Overall, I feel knowledgeable about suicide prevention	3.40	4.42	0.80	<.001
Composite Score	3.68	4.46	0.53	<.001

Table 3
Post-Only Trainer Effectiveness and Knowledge Application (N=244)

<i>Description</i>	<i>Mean</i>	<i>SD</i>
Trainer Effectiveness		
Trainer appeared knowledgeable about the subject	4.91	.42
Trainer presented content in an organized manner	4.81	0.43
Trainer responded to questions/comments effectively	4.79	0.43
Trainer focused discussions on application of the material	4.81	0.41
Overall, this was an effective training	4.77	0.47
Trainer/Training Eval summary score	4.80	0.40
Knowledge Application		
Training provided me with new information about suicide prevention	4.48	0.66
Training helped me understand the importance of suicide prevention in athletics	4.58	0.57
Training showed me how to get help for someone thinking about suicide	4.62	0.51
Training helped me feel more comfortable talking to someone about suicide	4.45	0.68
Training helped me understand my role in suicide prevention	4.53	0.58
I plan to recommend this training to other athletic staff	4.46	0.64
Overall, I learned new knowledge and skills from this training	4.55	0.61
Overall, I feel like I will be able to apply what I learned from this training	4.55	0.54
Knowledge/Application of Skills summary score	4.53	0.50

by the item *Training helped me to understand the importance of suicide prevention in athletics* ($M = 4.58$, $SD = .57$). The lowest rated item was *Training helped me feel more comfortable talking to someone about suicide* ($M = 4.45$, $SD = .68$). Two other items had mean scores below 4.50: *I plan to recommend this training to other athletic staff* ($M = 4.46$, $SD = .64$), and *Training provided me with new information about suicide prevention* ($M = 4.48$, $SD = .66$). The remaining three items were: *Training helped me understand my role in suicide prevention* ($M = 4.53$, $SD = .58$), *Overall, I learned new knowledge and skills from this training* ($M = 4.55$, $SD = .61$), and *Overall, I feel like I will be able to apply what I learned from this training* ($M = 4.55$, $SD = .54$).

Post-Training Qualitative Responses

Two-hundred and nineteen (219) distinct comments were provided for the item, *what are the top two things you learned during this training?* How to have direct conversations about suicide was indicated in over half of the comments, and seven recurrent topics were identified: 1) How to have direct conversations about suicide ($n = 127$), 2) Warning signs and risks ($n = 68$), 3) Additional resources and how to get help ($n = 62$), 4) Suicide model ($n = 60$), 5) Responding with empathy and understanding ($n = 20$), 6) Prevention strategies and role in suicide prevention ($n = 16$), and 7) Suicide statistics ($n = 8$). One-hundred and sixty (160) responses were provided for the item, *please list one or two topics you would like to have learned more about*. Thirty-three responses were positive with no criticism or “N/A” leaving 127 comments that could be categorized into a theme. The eight recurrent topics and the respective number of positive checks are: 1) Additional resources and how to help with real-life examples ($n = 36$), 2) Having direct conversations about suicide ($n = 31$), 3) Warning signs and risks factors ($n = 23$), 4) Prevention with different populations ($n = 16$), 5) More in-depth instruction of the suicide model ($n = 12$), 6) More about suicide statistics and mental health ($n = 12$), 7) Prevention strategies and role in suicide prevention ($n = 9$), and 8) Responding with empathy and understanding ($n = 8$). Less than 60 additional comments were provided, with most focused on proposed edits to the training, positive feedback about the training, and a desire for more training time.

Three-Month Follow-Up Perceived Suicide Prevention Knowledge, Confidence, Comfort, and Behavior Activation

Seventeen (17) participants provided matched 3-month follow-up ratings for the eight pre- and post-training items and additional items assessing behavior activation. No statistical analyses were conducted using the 3-month follow-up responses and descriptives are presented here only as preliminary data. A drop in mean scores below post-training, but not down to pre-training baseline levels, was expected for the eight matched items. However, preliminary results indicate that follow-up ratings are largely steady with a composite mean score of 4.51 ($SD = .47$) compared to 4.46 post-training and 3.68 pre-training. All follow-up scores for the eight items remained above pre-training baseline and only the item *I understand a suicide risk model* was noticeably lower at follow-up ($M = 4.18$) than post-training ($M = 4.46$). The item with the largest noticeable increase from post-training ($M = 4.33$) to follow-up ($M = 4.65$) was *I feel comfortable talking to someone about getting help*. See Table 4 for an overview of follow-up data.

Twelve participants reported that they had talked to someone about what they learned since taking the training, with all 12 reporting they had spoken with colleagues/supervisors, 3 spoke to family, 3 spoke to friends, and 2 reported speaking with others. The most common topic discussed was risk factors and warning signs, followed by protective factors/safety nets,

resources, how to talk to someone, suicide risk model, and how to get help. Half estimated they spoke with 3-5 individuals, 4 spoke with 1-2 individuals, and 2 spoke with 6-10 individuals.

Seven participants reported encountering someone who was thinking about suicide or in a mental health crisis since taking the training, with all reporting they had used knowledge or skills learned during the training in the interactions. All 7 participants used the following knowledge or skills: knowledge about suicide risk factors and warning signs, knowledge of suicide prevention resources, asking directly about thoughts of suicide or harm, strategies to talk to someone about suicide, and strategies to get someone help. Seven of the 10 participants who did not report encountering someone thinking about suicide or in crisis felt confident or very confident they would be able to use what they learned.

Table 4
Knowledge and Comfort 3-Month Follow-Up (N=17)

<i>Evaluation Item</i>	<i>Mean</i>	<i>SD</i>
Believe suicide prevention can benefit athletic staff	4.82	0.39
Can identify suicide protective factors (e.g., safety nets)	4.47	0.51
Can identify the risk factors and warning signs of suicide	4.47	0.51
Understand a suicide risk model (e.g., Joiner model)	4.18	0.81
Feel comfortable talking to someone about getting help	4.65	0.49
Know what resources to offer someone who may be thinking about suicide	4.65	0.49
Feel comfortable talking to someone about suicide and suicide prevention	4.41	0.62
Overall, I feel knowledgeable about suicide prevention	4.41	0.62
Composite Score	4.51	0.47

Discussion

Although shown to be an effective component of broader suicide prevention strategies, the effect of gatekeeper training in athletics is not well studied. Furthermore, to our knowledge, there are no cross-institutional suicide prevention gatekeeper trainings that are specific to athletics. The primary goal of this evaluation was to assess whether *VC Athletic Staff* would prove to be an effective training for participating athletic staff across a range of athletic programs. Data from this pilot project suggests that, although results cannot be generalized, *VC Athletic Staff* may be an option as a brief athletic-specific gatekeeper training that can improve athletic staff knowledge about suicide prevention, confidence talking to others about suicide, and behavioral intention to engage with others that may be at-risk.

Consistent with our initial proposition, results suggest that participating in the 2-hour *VC Athletic Staff* program increased from pre- to post-training respondents' self-perceived knowledge about suicide prevention, confidence identifying risk factors, and comfort talking to others about suicide. These gains in knowledge and comfort levels are important as existing literature indicates that one of the primary barriers to directly addressing suicide in specific settings are lack of skill and difficulty knowing what to say (Rebair & Hulatt, 2017). Aligned with our second proposal, participants had favorable ratings about the quality of the trainers and

the training overall and had high self-perceived ratings of behavioral intention.

Respondents indicated that they gained new skills, felt the training provided them with practical applications, and felt able to apply what they learned during the workshop. We were unable to statistically evaluate our third proposal due to a low sample size. However, preliminary results were surprising as the expected trend for self-perceived knowledge, confidence, and comfort to decay at 3-month follow-up did not appear to occur and outcomes remained about the same as post-training. This is an important preliminary finding for training programs in general as research often shows a decay at 3-month follow-up (Holmes et al., 2021; Rallis et al., 2018). Overall, the *VC Athletic Staff* training workshop appears to not only increase participant knowledge, but to also foster skills that may lead to participants being more likely to connect with others struggling with suicidal thoughts.

The *VC Athletic Staff* development process was designed specifically with best practices using both a suicide prevention model and a community-engagement framework. The inclusion of the Interpersonal Theory is, we believe, novel and appears to allow for nuance that may be missing in other training programs and prevention strategies for athletics. Participants noted that the Model was one of the top take-aways from the training and anecdotally conversations during training sessions were often focused on how the Interpersonal Theory can be used to understand distal relationships with risk factors. Furthermore, Holmes et al. (2021) showed that training context is important and understanding the broader cultural context in which trained individuals live and work is important as intentions may be diminished by factors such as societal norms. We developed *VC Athletic Staff* using a community engagement approach by working collaboratively with groups of people from the athletic community to better understand terminology and culture and to adapt the original *VitalCog* training to the extent possible. This includes identifying factors such as official disciplinary actions, injuries, and social media, and demonstrating how the factors may be risks for suicide in an athletic context. Although not perfect, it appears that the community engagement approach to set context within the Interpersonal Theory was largely effective for developing a training program that is specific to athletic staff and broadens understanding of risk factors in athletic environments.

VC Athletic Staff utilizes best practices and aligns with recommendations to improve gatekeeper trainings. Hawgood et al. (2022) recommend a minimum set of competency categories that gatekeeper trainings should address. The *VC Athletic Staff* training aligns with these competencies to address knowledge gain via didactic sessions and videos, skills and abilities via interactive group discussions and role-play exercises, attitudes via understanding the importance of suicide prevention in athletics, and self-efficacy by giving all participants the opportunity to role-play asking others about suicide. The focus on behavioral activation during training importantly provides participants with a base-level of confidence in initiating conversations when needed. As recommended by Shtivelband et al. (2015), the program also provides participants with a certification and awareness of other community resources. It is further recommended that gatekeeper training be part of a multi-faceted approach to suicide prevention that also includes other aspects, such as reducing access to lethal means, community and other awareness campaigns, access to mental health treatment, and follow-up with individuals after an attempt. Some of the recommended approaches require access to credentialed mental health professionals, and some fit within the community engagement framework along with gatekeeper training. The goal is not for *VC Athletic Staff* to be a stand-alone prevention measure but rather part of a more integrated prevention strategy.

Though the findings from this project are informative, they should be interpreted within the context of limitations. First, it is unclear the level to which changes can be attributed to the training in the absence of a control group. Kuhlman et al. (2021) conducted a pilot randomized

controlled trial of a gatekeeper training and found a significant positive impact of gatekeeper training versus the control suggesting positive value of gatekeeper training. It remains though that while an open pilot is appropriate at this stage of *VC Athletic Staff* program development, a future randomized control trial will provide a stronger test of training effects. Second, the evaluation would be strengthened by statistical analysis of the follow-up data to include the addition of longer term (e.g., 6-12 month) outcomes post-training. Our focus on ecological validity and community engagement does pose a challenge as voluntary trainees do not have as much incentive to complete follow-up evaluations. We encouraged participants to complete assessments to assist with program development and it is likely that those completing the 3-month follow-up did so out of a desire to help. We included the follow-up data here to provide preliminary information rather than delay; however, these data trends must be considered within the context of a low sample size and lack of comparative analysis. Third, the data was collected as part of a quality improvement program evaluation process rather than as a formal research project, thus limiting the rigor of the process and the results cannot be generalized. A more formalized data collection process would allow for more flexibility in analysis and comparison. Finally, while content validity of the evaluation measure that was developed for this program was evaluated, the use of another validated measure may assist with comparisons to other programs. The use of other validated measures may also broaden the assessment to include attitudes about and stigma related to mental health and help-seeking behaviors.

Conclusion

While efforts, such as the NCAA's best practices and the NAIA's toolkit, are being made to address mental health concerns among student-athletes, considerable variability remains among schools as to the ability to implement programming (Anchuri et al., 2020). This includes resources to develop, implement, and sustain suicide prevention training. *VC Athletic Staff* was purposefully developed to be implemented across various institutions and levels, at relatively low cost. *VC Athletic Staff* trainers participate in an 8-hour training certification course, have access to continuing education resources, and can coordinate with other trainers on best practices, allowing for dissemination to occur at the institutional level rather than through a larger central group. These results suggest that the goals of this pilot evaluation were achieved and that the training may be an effective and flexible gatekeeper suicide awareness and prevention training for athletics. Participants showed significant increases in self-perceived competency about suicide prevention from pre- to post-training, and reported high levels of agreement that *VC Athletic Staff* is an effective training. While there are ways to strengthen both the *VC Athletic Staff* program and subsequent evaluations including more specificity with demographic information, for now, there are indications that this training may provide an accessible option for athletic staff and offers recommendations to others that may in turn develop a similar training. Finally, a consistent recommendation to improve gatekeeper training is the inclusion of periodic "booster" training sessions. Although not tested here, it is likely that ongoing, annual suicide prevention refresher courses, similar to recommendations to maintain CPR certification, would be sufficient and at similar cost.

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