2024

Examining the effects of manualized suicide intervention training on clinical psychology doctoral trainees: A quasi-experimental trial

Alexander Dorfman M.S.

EXAMINING THE EFFECTS OF MANUALIZED SUICIDE INTERVENTION TRAINING ON CLINICAL PSYCHOLOGY DOCTORAL TRAINEES: A QUASI-EXPERIMENTAL TRIAL

ALEXANDER DORFMAN, M.S.

A DOCTORAL DISSERTATION SUBMITTED

TO THE FACULTY OF

THE GRADUATE STUDIES PROGRAM

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

C. W. POST CAMPUS

LONG ISLAND UNIVERSITY

MAY 30, 2024

MAJOR DIVISION: PSYCHOLOGY

SPONSORING COMMITTEE:

_____ _____

Ki Eun (Kay) Shin, Ph.D. Date

_____ _____

Hilary Vidair, Ph.D. Date

_____ _____

Eva Feindler, Ph.D. Date

Acknowledgments

I wish to express my deepest gratitude to Kay for her everlasting support, willingness to tolerate my bad jokes, and commitment to my personal and professional growth. When I brought my initial research proposal to her two years ago, I had no idea how that would spark the course of events leading to my involvement in such a meaningful project. I would not be here without her exceptional mentorship that kept me afloat innumerable times.

To Hilary and Eva, I extend my deepest gratitude for their willingness to serve on my committee and for guiding me through this program over the last four years and counting.

To Lauren, I extend my deepest gratitude for her steadfast support in the internship process over the past year—that guidance afforded me the necessary foundation to pursue my expedited dissertation timeline whilst navigating the tremendous anxieties of the internship process.

To Mom, Dad, Sara, Phil, Amanda, and Daniel, I extend my deepest gratitude for supporting me in this process even when they may not have understood what I was working on at the time.

To Sidney, I extend my deepest gratitude for being my person both in and beyond this program.

To Katerina and Emma, I extend my deepest gratitude for continuously pushing me forward.

To Brie—my love—I extend my deepest gratitude for being there for me, always.

Abstract

Although most clinical psychology doctoral trainees encounter at least one suicidal client over the course of their training (Dexter-Mazza & Freeman, 2003), there is notable variability in the degree of formal suicide risk assessment and intervention training offered across clinical psychology doctoral programs (Monahan & Karver, 2021). Most suicide-related training involves passive (e.g., lectures) rather than active (e.g., role-plays, experiential exercises) training techniques, despite evidence for the effectiveness of the latter in improving clinicians' skills (Gryglewicz et al., 2020). The Applied Suicide Intervention Skills Training (ASIST) is a manualized, evidence-based training incorporating didactics and role-plays (LivingWorks, 2013; Rodgers, 2010). The current study used quasi-experimental trial data—including two groups matched on key characteristics—to examine the impact of ASIST on different facets of suicide-related competence (perceived competence, knowledge, and intervention skills) and attitudes toward suicide among clinical psychology doctoral trainees. Quasi-experimental group and nonequivalent-control group participants completed self-report measures on suicide-related competence and attitudes toward suicide at pre-training, post-training, and 3-month follow-up. Results showed greater increases in suicide-related competence from pre- to post-training for trainees who completed ASIST compared to trainees who did not. This group difference was maintained when examining changes from pre-training to 3-month follow-up. Conversely, ASIST did not appear to facilitate significant changes in attitudes toward suicide over time. Findings from this study inform the utility of incorporating manualized suicide risk assessment and intervention training programs in clinical psychology doctoral training curricula.

Table of Contents

Examining the Effects of Manualized Suicide Intervention Training on Clinical Psychology Doctoral Trainees: A Quasi-Experimental Trial

Suicide is a leading cause of death in the United States, with over 49,000 deaths in 2022, or approximately one death every 11 minutes (Centers for Disease Control and Prevention [CDC], 2024). Per the CDC, it is estimated that over 12 million adults seriously thought about suicide, 3.2 million adults planned a suicide attempt, and 1.2 million adults attempted suicide in 2020. Suicidal ideation and suicidal behavior—defined as suicidal thoughts and plans or as suicide attempts, respectively—are both moderately associated with a future suicide death (Large et al., 2020). Researchers have also identified a vast array of demographic (e.g., gender, age) and psychiatric factors (e.g., mood and anxiety disorders, substance use disorders, and personality disorders) associated with an increased risk of suicidal thoughts and behaviors (Franklin et al., 2017; Guzmán et al., 2019).

Between the prevalence of suicidal thoughts and behaviors and the range of associated risk factors, it is reasonable to anticipate that clinicians might encounter clients endorsing suicidal thoughts or behaviors at some point in their clinical work, whether as seasoned professionals or fledgling trainees. Prior research suggests that most clinical psychology graduate students are likely to encounter at least one suicidal client over the course of their clinical training. Dexter-Mazza and Freeman (2003) surveyed 238 clinical psychology predoctoral interns on their suicide-related training and clinical experiences and found that participants reported encountering a median of 7.5 suicidal clients—additionally, 99% of the sample treated at least one suicidal client during their training. Similarly, Kleespies et al. (1993) surveyed 292 former psychology interns and found that 97% of respondents had treated at least one suicidal client during their training. It is of note that those results may still underestimate the frequency

with which clinical psychology trainees interact with clients at risk of suicide. Not all individuals at risk disclose their suicidality to their therapists (e.g., Blanchard & Farber, 2020; Cukrowicz et al., 2014). This notion lends further credit to the notion that most, if not all, psychology trainees will likely encounter suicidal clients while they are still in training.

Suicide-Related Competence

On a foundational level, the assessment and treatment of suicidal individuals necessitates that clinicians meet a particular threshold of relevant clinical competence. As noted by Schmitz et al. (2012), suicide-related competence has been defined in various ways. Quinnett (2010) defined suicide-related competence as the capacity to conduct comprehensive clinical interviews, identify risk and protective factors, make risk stratification decisions, employ risk mitigation interventions, and enact collaborative safety planning—this definition has been subsequently adopted by the American Association of Suicidology [AAS] (Schmitz et al., 2012). Other comprehensive frameworks have been also proposed including that of the Suicide Prevention Resource Center [SPRC] (2006), which outlined 24 distinct competencies across seven key domains: attitudes and approach toward suicide (e.g., exhibiting authenticity and empathy), suicide comprehension, accurate assessment, risk formulation, treatment planning, managing care, and legal-regulatory factors (e.g., documentation and informed consent) (Pisani et al., 2011). Cramer et al. (2013) integrated existing research into a framework consisting of ten core competencies for suicide risk assessment and intervention (e.g., managing attitudes about suicide with clients and enacting collaborative treatment plans).

Despite these researcher and advocacy group efforts to clarify the elements of suicide-related clinical competence, it is unclear whether doctoral trainees receive appropriate training to meet such thresholds of competence. Based on Bongar and Harmatz's review (1991) of 117

graduate clinical psychology programs, less than 40% of the participating programs offered formal training related to suicide. About a decade later, Dexter-Mazza and Freeman (2003) surveyed clinical psychology predoctoral interns and found that only 50.8% of them reported receiving formal suicide training in their program. These findings are especially striking in light of the American Psychological Association's Code of Ethics (2017), which specifies that psychologists perform work within their boundaries of competence based—at least in part—on their education and training. Despite an ethical and clinical need to ensure suicide-related competence among present and future psychologists, it appears that formal suicide training efforts across doctoral programs were inadequate. The AAS went so far as to refer to the lack of suicide-related training requirements across mental health disciplines as "egregious" and negligence that might endanger clients at risk for suicide (Schmitz et al., 2012).

Recent studies have indicated higher rates of formal suicide risk assessment and intervention training in clinical psychology doctoral programs. In one study comprised of 59 clinical psychology doctoral trainees, over 75% of trainees reported having received suicide-related training in their doctoral program (Mackelprang et al., 2014). A more recent study (Monahan & Karver, 2021) surveyed 167 clinical psychology doctoral trainees and found an even higher rate, where approximately 96% of the trainees reported receiving suicide-related training. These numbers are reassuring and represent a substantive increase from the rates found in prior studies (e.g., Dexter-Mazza & Freeman, 2003).

While current clinical psychology doctoral trainees receive suicide-related training more frequently than before, there remain questions about the quality and effectiveness of such training. For instance, types of formal suicide-related classroom training (e.g., didactics on suicide risk assessment, legal and ethical issues around suicide, and documentation about clients

reporting suicidality) and the quantity or length (e.g., number of hours) of suicide-related training received were not consistently associated with the degree of suicide intervention competence among trainees (Mackelprang et al., 2014; Monahan & Karver, 2021). It has since been posited that formal classroom training offered in clinical psychology doctoral programs—either variable in its occurrence (Monahan & Karver, 2021) or frequently limited to less than six hours of passive, didactic instruction (Robillard et al., 2022)—may not be adequate. It is both surprising and discouraging that higher rates of suicide-related training in doctoral programs did not necessarily translate into improved suicide-related competence among trainees. One explanation is that not all suicide-related training is made equal. As described by Monahan and Karver (2021) and Robillard et al. (2022), there is notable variability in the content and delivery format of such training offered across clinical psychology doctoral programs. For example, trainees surveyed by Monahan and Karver (2021) reported a wide range of training formats including one-time lectures within required or elective courses, full-semester courses focused on suicide-related training, or training held through research labs, program clinics, or external practicum sites. Despite the evidence for a substantial increase in the rates of doctoral trainees receiving formal suicide-related training, receiving a higher dosage of less than optimal or ineffective training may fall short of reliably improving doctoral trainees' suicide risk assessment and intervention skills.

Interestingly, Mackelprang et al. (2014) found that trainees with more clinical experiences in working with suicidal clients demonstrated better suicide intervention competence as measured by the Suicide Intervention Response Inventory-Revised (SIRI-2; Neimeyer & Bonnelle, 1997). On this validated measure of suicide intervention skills, trainees rated the appropriateness of response prompts to sample statements made by hypothetical suicidal clients,

and their ratings were compared to the consensus ratings by a criterion group of suicidology experts. Trainees with prior experiences of treating suicidal clients obtained significantly better scores on the SIRI-2 (i.e., less discrepancy from the expert consensus ratings) than those without such experiences (Mackelprang et al., 2014). In other words, actual clinical experiences with suicidal clients were associated with greater suicide intervention competence (Mackelprang et al., 2014). This finding suggests that suicide-related training would be more effective when it approximates actual clinical experiences more closely. Most suicide-related training involves passive (e.g., lectures) rather than active training techniques (e.g., role-plays, experiential exercises) despite evidence for the effectiveness of the latter in improving clinicians' skills (Gryglewicz et al., 2020). In light of the aforementioned variability in the quality and intensity of suicide-related training across clinical psychology doctoral curricula, one potential solution is to introduce manualized training that incorporates active and experiential learning elements (e.g., role-plays and simulation exercises).

Another way to improve upon current suicide-related training is to incorporate reflection on and modification of attitudes toward suicide. Batterham et al. (2013) broadly defined attitudes toward suicide as one's behavioral, cognitive, and affective evaluations of suicide and stigmatization of suicide (e.g., holding negative evaluations of individuals who have died by suicide). Suicide remains highly stigmatized even among healthcare professionals (Cerel et al., 2006; Emul et al., 2011). Deska et al. (2020) surveyed 34 psychology doctoral trainees and their supervisors, as well as 64 laypeople, and found that both trainees and their supervisors held negative mental representations of suicide. While such representations were less negative than laypeople's mental representations of suicide, the trainees' and supervisors' representations of suicide were more negative (e.g., dehumanizing and cold) than those of low- and high-severity

forms of psychopathology including schizophrenia and attention-deficit hyperactivity disorder. This finding is consequential for individuals at risk of suicide because common experiences with facing stigma in healthcare settings—like having concerns minimized or feeling stigmatized (Cerel et al., 2006)—might lead those individuals to conceal their suicidal thoughts or behaviors (Frey et al., 2015) or to forgo or avoid treatment (Calear et al., 2014). Negative or stigmatizing attitudes toward suicide among counseling trainees were also inversely correlated with suicide knowledge (e.g., ability to recognize risk factors for suicide) (Atay & Serim-Yıldız, 2023). In the general population, low levels of suicide knowledge and negative attitudes toward suicide were also associated with decreased help-seeking intentions and behaviors (Mok et al., 2020). It is reasonable to posit that suicidal individuals—especially those with stigmatizing attitudes toward suicide—might receive ineffective care in the presence of healthcare professionals with similar negative attitudes toward suicide. One outcome of this ineffective care could be an elevated risk for future episodes of suicidal thoughts and behaviors (Atay & Serim-Yıldız, 2023; Schmitz et al., 2012). These findings indicate that it is vital to promote positive attitudes toward suicide (e.g., minimal stigmatization of individuals who die by suicide, willingness to work with suicidal clients, and respect for an individual's right to suicide) among mental health practitioners given their impact on suicide risk assessment and intervention efforts.

In considering attitudes toward suicide—within Batterham et al.'s definition (2013) that incorporates the stigmatization of suicide—it might be relevant to consider the role of one's social or cultural environment. The sociology of stigma can generally be understood as how one's social or cultural environment might influence their evaluations of other groups or identities. It is these influences that have been integrated into many key psychological theories of suicide; for example, Joiner's (2005) interpersonal theory of suicidal behavior identified

thwarted belongingness—that is, a mental state in which one's perceived fundamental need for social connectedness is unmet—as a key element in determining one's capacity for suicidal behavior. Elsewhere, Chu et al. (2010) developed a cultural theory of suicide with four cultural factors (cultural sanctions, idioms of distress, minority stress, and social discord) that have been empirically shown to be associated with suicide risk and acute life events for minoritized individuals (Chu et al., 2022). Mueller et al. (2021) further stressed the importance of the social environment as a key component of suicide prevention strategies. They described how suicide prevention interventions that address social or cultural biases can minimize mental health stigma, increase help-seeking behaviors, and decrease the prevalence of suicidal thoughts and behaviors across communities. When it comes to training, minimal research has examined cultural variables among trainees in relation to their suicide-related competence. One recent study surveyed advanced standing master's students and master's-level clinicians (N = 132) and found that higher levels of perceived spiritual support positively predicted greater self-efficacy in conducting suicide risk assessment (Hendrix, 2023). These findings suggest the need to consider how the cultural identities of mental health practitioners might factor into their attitudes toward suicide and their interactions with clients exhibiting suicide risk.

Applied Suicide Intervention Skills Training (ASIST)

The Applied Suicide Intervention Skills Training (ASIST) is a two-day, manualized, and evidence-based suicide intervention training program that incorporates both didactics and experiential learning components (LivingWorks, 2013; Rodgers, 2010). The efficacy of ASIST has been tested across different countries such as the United Kingdom (Evans & Price, 2013; Griesbach et al., 2008), Canada (McAuliffe & Perry, 2007), the United States (Coleman et al., 2008), and Lithuania (Rimkevičienė et al., 2020). The effectiveness of ASIST has also been

demonstrated among multiple populations including crisis counselors (Gould et al., 2013), college staff (Shannonhouse, Lin, Shaw, Wanna et al., 2017), behavioral health care staff (Silva et al., 2016), and K-12 schoolteachers (Shannonhouse, Lin, Shaw et al., 2017). As demonstrated by the broad array of populations included in ASIST-related studies, ASIST is not specifically geared only toward clinical populations—rather, it has been tested among non-clinician populations (e.g., schoolteachers) as well as clinician populations (e.g., counseling trainees). ASIST is grounded in the "Pathway for Assisting Life" (PAL) model—in which the caregiver endeavors to connect with a person at risk of suicide, understand their choices, and assist in promoting their safety (LivingWorks, 2013). A primary objective for the caregiver engaging with a person at risk of suicide is to exhibit willingness to openly address suicidality and collaborate with the person in identifying what they might want or need to remain safe. Components of ASIST include identifying intervention needs of at-risk persons, practicing how to develop safety plans, and attaining appropriate resources for use with at-risk persons and dissemination within communities at large. These components align well with the existing frameworks of suicide-related competence for doctoral trainees (Cramer et al., 2013; SPRC, 2006).

The PAL model places great value on a strong level of rapport between the caregiver and the person at risk of suicide (Rodgers, 2010). The rationale is that the caregiver is expected to deftly wade between exploring and validating the painful feelings prompting suicidal actions and still moving the individual toward safety. The PAL model affords structured intervention steps such that this balance is achievable for individuals in non-clinician populations to implement with a person at risk of suicide. At the same time, the emphasis on rapport and connection between the caregiver and the person at risk of suicide aligns with the importance of maintaining a therapeutic alliance for effective clinical practice (Rogers, 1957; Shannonhouse et al., 2018). It

is reasonable to then suggest that the PAL model is both suitable for non-clinician populations and clinician populations—particularly with the more expansive clinical toolset that the latter group brings to the table in providing suicide-related interventions.

In addition to teaching suicide knowledge and risk mitigation and intervention strategies, ASIST focuses on trainees reflecting on their attitudes toward suicide (LivingWorks, 2013; Rodgers, 2010). Trainers facilitate group discussions among trainees to explore, identify, and articulate attitudes toward suicide (Lang et al., 2007). While the primary goal of this discussion is to freely discuss attitudes toward suicide, a secondary goal is to encourage reflection on and modification of those attitudes, as appropriate, to effectively work with individuals at risk of suicide. The greater length of ASIST (i.e., 14 hours) relative to other gatekeeper training programs (i.e., generally lasting between one and five hours) affords a unique opportunity to address attitudes of trainees in depth (Rodgers, 2010). It is of note that among clinical psychology doctoral trainees, more positive attitudes toward suicide predicted a higher intent to conduct suicide risk assessment with clients (Monahan & Karver, 2021). More negative or stigmatizing attitudes (e.g., believing that individuals who attempt suicide are cowardly) were also associated with lower suicide literacy or knowledge of suicide risk factors and signs of risk among counselor trainees (Atay & Serim-Yıldız, 2023).

It is important to note that there exist other suicide intervention training programs beyond ASIST that have demonstrated efficacy. For example, Question, Persuade, and Refer (QPR; QPR Institute, 1995) is a suicide gatekeeper training geared toward recognizing warning signs of suicide and knowing how to offer and attain support for people at risk of suicide. A recent systematic review (Holmes et al., 2021) indicated the efficacy of QPR among multiple populations including school-aged and university students, faculty members, school

professionals, campus community members, nurses, youth service providers, and parents. There is an additional online training—Question, Persuade, Refer, and Treat (QPRT; Suicide Prevention Resource Center, 2010)—that instructs mental health professionals on conducting guided clinical interviews and has shown effectiveness in improving suicide prevention knowledge and perceived behavioral control among mental health professionals (Gryglewicz et al., 2017; O'Brien et al., 2019). As outlined by Jobes et al. (2015), other relevant suicide-related clinical interventions have demonstrated significant reductions in suicide-related problems (e.g., non-suicidal self-injurious behavior and suicide attempts) among clinical populations; that said, studies examining the effectiveness on client outcomes for even the most well-known interventions—such as dialectical behavior therapy (Linehan, 1993), cognitive therapy for suicide prevention (Brown et al., 2005), and the collaborative assessment and management of suicidality (CAMS; Jobes, 2006)—have primarily focused on use of the interventions by professional clinicians (e.g., licensed psychologists and social workers) rather than trainees. Although these clinical interventions exist in a separate category from suicide intervention training programs, there is a dearth of literature focused on trainee implementation or learning of these interventions.

There is emerging evidence on the efficacy of the ASIST program among trainees in the mental healthcare field. Elston et al. (2019) conducted a quasi-experimental study in which 29 master's-level counselors-in-training (CITs) had completed ASIST while the matched-control group of 25 CITs had not. CITs who completed ASIST were more likely to report identifying and using suicide intervention strategies with clients at risk compared to CITs who did not complete ASIST. In a separate content analysis of the same data from Elston et al. (2019), master's-level CITs were found to develop a greater understanding of suicide, less judgmental

attitudes toward suicide, nuanced understanding of warning signs, and greater willingness to intervene as a result of completing ASIST (Shannonhouse et al., 2019). Following the ASIST completion, master's-level CITs also retained their improvements in suicide risk assessment and intervention competence at 3-months post-training (Shannonhouse et al., 2018; 2019), including using evidence-based suicide intervention strategies with suicidal clients and holding non-judgmental attitudes toward suicide.

The Current Study

The literature on suicide-related training among clinical psychology doctoral trainees remains sparse despite its importance and relevance. This gap is significant, especially given that there already exists robust literature on the efficacy of suicide risk assessment and intervention training within other populations. For example, the short- and long-term efficacy of gatekeeper training for non-professionals has been studied extensively (e.g., Holmes et al., 2021). Other suicide assessment or intervention training programs (e.g., CAMS; Jobes, 2006) have examined client outcomes and training effects primarily among independent practitioners. However, the efficacy of such evidence-based training programs has rarely been examined among clinical psychology doctoral trainees. The underrepresentation of clinical psychology doctoral trainees in the suicide-related training literature is concerning, given the high likelihood that those trainees will encounter suicidal individuals during their clinical training (Dexter-Mazza & Freeman, 2003). ASIST stands out as a relevant training program for doctoral clinical psychology trainees given recent promising results among master's-level CITs (Elston et al., 2019; Shannonhouse et al., 2018; 2019). However, no study has examined the efficacy of the ASIST program among clinical psychology doctoral trainees, let alone at follow-up time points to assess the maintenance of gains.

The purpose of the present study was to address this gap and examine the immediate and long-term effects of ASIST on suicide-related competence (including perceived competence, knowledge, and suicide intervention skills) and attitudes toward suicide among clinical psychology doctoral trainees. The study used a quasi-experimental design to pursue three aims. First, clinical psychology doctoral trainees who completed ASIST and those who did not were compared based on the degrees of change in their suicide-related competence from pre- to post-training. It was hypothesized that those who completed ASIST would demonstrate a greater increase in suicide-related competence than those who did not complete ASIST. Second, the current study compared the two groups based on changes in attitudes toward suicide from pre- to post-training. It was hypothesized that those who completed ASIST would demonstrate a greater increase in positive attitudes toward suicide (i.e., increased non-judgmental and empathetic attitudes toward suicidal individuals) compared to those who did not complete ASIST. Third, the study examined the maintenance of gains from ASIST, or group differences in suicide-related competence and attitudes towards suicide, from pre-training to a three-month follow-up. It was hypothesized that group differences in suicide-related competence and attitudes toward suicide would be maintained at a three-month follow-up.

Method

Design

The present study used quasi-experimental trial data including pre-training, post-training, and 3-month follow-up assessments. This study examined the effects of ASIST completion (nonequivalent-controls versus experimental group) and time (pre-training versus post-training; pre-training versus 3-month follow-up) on the outcomes of suicide-related competence and attitudes toward suicide. A similar design was used previously to examine the efficacy of ASIST

among master's-level counseling trainees (Shannonhouse et al., 2018).

Participants

The sample included 56 clinical psychology doctoral trainees (22 experimental, 34 non-equivalent controls) from APA-accredited programs in the U.S. The experimental group (n = 22) was recruited from an APA-accredited clinical psychology doctoral program at a private university in New York State. The study was advertised to second-year clinical psychology doctoral trainees who were starting their first clinical practicum at a university-based outpatient community clinic and a student counseling center during an orientation preceding the start of their practicum. Trainees were offered an opportunity to complete a two-day ASIST program regardless of whether they chose to participate in the study. The control group (n = 34) was recruited via listservs of psychology-related professional organizations, online graduate student forums, and emails addressed to directors of clinical training at APA-accredited clinical psychology doctoral programs for distribution to their students. Participants in the control group were screened to be matched to the experimental group on the following key attributes: second-year clinical psychology doctoral student status; starting first clinical practicum of doctoral training; engaging in a practicum at a university-based outpatient community clinic and/or a student counseling center; and no prior exposure to ASIST.

Table 1 presents demographic characteristics and clinical training background of trainees by group. Average age of the sample was 25.14 (SD = 2.54). Based on sex assigned at birth, 46 trainees (82.1%) identified as female, and 10 (17.9%) identified as male. In terms of their gender identity, 44 trainees (78.6%) in the sample identified as cisgender female, 11 (19.6%) as cisgender male, and 1 (1.8%) did not specify their gender. In terms of their racial and ethnic make-up, 47 trainees (83.9%) identified as White and 48 (85.7%) as Non-Hispanic—

furthermore, 3 (5.4%) trainees identified as Black or African American, 2 (3.6%) as Asian, 1 (1.8%) as American Indian or Alaskan Native, 3 (5.4%) as Multiracial, and 8 (14.3%) as Hispanic. As for sexual orientation, 43 trainees (76.8%) identified as heterosexual or straight, 1 (1.8%) as gay or lesbian, 9 (16.1%) as bisexual, and 1 (1.8%) as questioning their sexual orientation. Two trainees (3.6%) identified their sexual orientation as "Other". In terms of religious identity, 6 trainees (10.7%) identified as Protestant, 3 (5.4%) as Roman Catholic, 16 (28.6%) as Jewish, 1 (1.8%) as Muslim, and 22 (39.3%) as Atheist, Agnostic, or nothing in particular. Eight trainees (14.3%) identified their religious affiliation as "Other" (e.g., Non-denominational Christian). When examining group differences on demographic factors, experimental and control groups significantly differed on sex assigned at birth, X^2 (1, n = 56) = 4.815, p = .038, and religious affiliation, X^2 (1, n = 56) = 23.794, p < .001. Of the 22 trainees in the experimental group, 15 (68.2%) identified as female, and 7 (31.8%) identified as male. Of the 34 trainees in the control group, 31 (91.2%) identified their sex assigned at birth as female and 3 (8.8%) identified as male. As for religious affiliation, 12 (54.6%) trainees in the experimental group identified as Jewish, 1 (4.5%) as Protestant, 2 (9.1%) as Roman Catholic, 1 (4.5%) as Muslim, and 6 (10.8%) as Atheist, Agnostic, or nothing in particular. Conversely, 16 (47.0%) trainees in the control group identified as Atheist, Agnostic, or nothing in particular, 5 (14.7%) as Protestant, 1 (2.9%) as Roman Catholic, 4 (11.8%) as Jewish, and 8 (14.3%) as other religions (e.g., Buddhist, Methodist, and Non-denominational Christian).

Of the overall sample, eight (14.3%) trainees reported having a master's degree in either clinical psychology or another mental health-related discipline. 19 (33.9%) trainees endorsed having prior experience with providing mental health services for suicidal clients. The current sample indicated, on average, moderate acceptability of suicide within their cultural groups

and/or identities (i.e., cultural sanctions), *M* = 14.59, *SD* = 4.70. At the 3-month follow-up, trainees reported on additional suicide-related clinical experiences attained during their participation in the study, including the number of hours of additional suicide-related training; the number of accrued clinical hours; and the number of the following types of clients in their caseload: those who appeared at risk of suicide, endorsed suicidal ideation, engaged in self-injurious behaviors, or had a suicide attempt. At the 3-month follow-up, on average, trainees reported having received 1.14 (*SD* = 2.56) hours of additional suicide-related training; accrued 61.79 (*SD* = 66.70) clinical hours; and worked with 1.23 (*SD* = 2.32) clients who appeared at risk of suicide, 0.78 (*SD* = 1.39) clients who endorsed suicidal ideation, 0.37 (*SD* = 1.08) clients who engaged in self-injurious behaviors, and 0.08 (*SD* = 0.28) clients who had a suicide attempt. When examining group differences on clinical experiences at pre-training and 3-month follow-up, experimental and control groups significantly differed on cultural sanctions scores, $t(54) = 2.71$, $p = .009$; the number of accrued clinical hours, $t(206.97) = -6.79$, $p < .001$; the number of clients who appeared at risk of suicide, $t(192.30) = -3.33$, $p < .001$; and the number of clients who endorsed suicidal ideation, $t(196.45) = -2.59$, $p = .01$. The experimental group reported lower acceptability of suicide in their cultural groups on average (*M* = 12.59, *SD* = 5.40) than the control group (*M* = 15.89, *SD* = 3.73). At the 3-month follow-up, the experimental group reported having fewer accrued clinical hours (*M* = 30.83, *SD* = 18.20) and having worked with fewer clients who appeared at risk of suicide (*M* = 0.20, *SD* = 0.93) and clients who endorsed suicidal ideation (*M* = 0.21, *SD* = 0.96) than the control group (*M* = 81.81, *SD* = 78.36 for accrued clinical hours; *M* = 1.64, *SD* = 2.85 for the number of clients at risk of suicide; *M* = 1.04, *SD* = 1.58 for the number of clients who endorsed suicidal ideation).

Procedure

All study procedures were approved by the institutional review board of the accredited New York State university housing the experimental group trainees in an APA-accredited clinical psychology doctoral program. Recruited participants completed a consenting process online and filled out online self-report surveys about demographic characteristics, suicide-related competence, and attitudes toward suicide for the baseline/pre-training assessment. Within ten days from the initial assessment, the experimental group completed the 2-day, 14-hour ASIST program in person. The training was conducted by three certified ASIST trainers based on the manualized curriculum and included standardized ASIST role-plays and didactics (LivingWorks, 2013). The nonequivalent-control group completed the pre-training measures within approximately the same period as the experimental group, but they did not complete the ASIST program. Both groups completed a post-training assessment an average of 11.61 days (*SD* = 4.41) after completing the pre-training measures, as well as a 3-month follow-up assessment. All assessments were administered via Qualtrics, a HIPAA-compliant online survey platform. Measures were administered in the same order across participants, and attention checks were incorporated intermittently between measures to gauge if participants were responding carefully throughout the assessments. After each assessment, participants were compensated with an Amazon gift card and received up to $18 in case they completed all three assessments. Participants were debriefed upon completion of their study participation.

ASIST Procedures

Three certified ASIST trainers led the training for this study in accordance with the standardized ASIST manual (Lang et al., 2007). ASIST trainers are certified based on their completion of the standardized, five-day ASIST trainer training and facilitation of at least three ASIST workshops (LivingWorks, 2013). Participants in the experimental group were required to

attend the training on both days (16 hours in total) and received a workbook to use throughout the training. Upon completion of training, participants filled out ASIST feedback forms, and trainers completed a post-training report outlining their adherence to the ASIST manual. Both forms were submitted to LivingWorks, the provider of the ASIST program.

During the two-day, 14-hour training, participants in the experimental group engaged with certified ASIST trainers in didactics and active learning experiences (e.g., role-plays) to review and practice skills in the ASIST model of suicide intervention (LivingWorks, 2013). On the first day of training, the ASIST trainers led trainees in group discussions about risk factors and indicators of past, present, or future suicidal thoughts and behaviors. Trainees also identified how their attitudes toward suicide impact how they intervene with suicidal patients. Lastly, trainees learned the PAL model (LivingWorks, 2013). Within this three-phase model, caregivers focus on connecting with a person at risk of suicide, understanding their choices, and assisting in promoting their safety. The model is collaborative and necessitates actions from both the caregiver (i.e., the person intervening) and the person at risk of suicide. On the second day of training, the ASIST trainers directed trainees through experiential role-plays during which trainees had opportunities to practice intervening with individuals at risk of suicide. Trainers initially led the role-plays to model effective suicide intervention practices within the PAL model, and trainees subsequently practiced both with trainers and with each other in groups to learn how to apply suicide intervention skills in simulated scenarios. Trainees also reviewed footage depicting the use of suicide intervention skills and application of the PAL model to interactions with individuals at risk of suicide. Throughout the training, trainees were observed and received feedback on their implementation of skills from the ASIST trainers.

Measures

Demographic Characteristics

At baseline/pre-training, participants completed a 13-item self-report form (see Appendix A) to report on their demographic background (e.g., ethnicity, gender, religious affiliation) and prior clinical experiences (e.g., the number of suicidal clients that they worked with previously).

Perceived Suicide-Related Competence and Knowledge

Suicide Competency Inventory (SCI; Lund et al. 2016). Originally developed by Graham et al. (2011), the SCI is a self-report measure assessing suicide-related competence. The current study used a modified, 11-item version (Lund et al., 2016; see Appendix B). At pre- and post-training, and 3-month follow-up, participants rated the degree to which they agreed with statements about suicide-related competence (e.g., "I am comfortable with the responsibility of treating suicidal clients.") on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Possible scores on the SCI range from 11 to 55 such that higher scores indicate greater comfort and perceived competence in working with suicidal clients. The measure yields three subscale scores: willingness to treat suicide (WT), willingness to assess for suicide (WA), and perceived competence to treat suicide (PC). The SCI has previously demonstrated good internal consistency ($\alpha = 0.87$) and high construct validity among master's-level vocational rehabilitation counselors (Cramer et al., 2013; Lund et al., 2016). In the present study, the SCI demonstrated good internal consistency across all three time points ($\alpha = 0.82–0.88$). Acceptable to excellent reliability estimates were found for SCI subscales as well (WT: $\alpha = 0.76–0.91$; WA: $\alpha = 0.81–0.89$; PC: $\alpha = 0.68–0.79$).

Suicide Competency Assessment Form (SCAF; Cramer et al., 2013). The SCAF is a 10-item self-report measure of core competencies of suicide risk assessment in psychology trainees (Cramer et al., 2013; see Appendix C). The core competencies include knowing and

managing attitudes and reactions toward suicide; developing and maintaining a collaborative relationship with the client; recognizing evidence-based risk and protective factors; focusing on suicidal intent and plan; determining level of suicide risk; enacting a collaborative and evidence-based safety plan; involving other individuals; documenting risk and clinical decision-making rationale; knowing the law concerning suicide; and engaging in self-care as a post-intervention practice. At pre- and post-training, and 3-month follow-up, participants rated their perceived degree of competence across these areas on a 4-point Likert scale (1 = *incapability to perform the task*, 4 = *advanced competency*). Total scores could range from 10 to 40, with higher scores indicating greater perceived competence in suicide risk assessment and intervention. Also, the measure incorporates a single-item (SCAF G) rated on an 8-point Likert scale (1 = *unacceptable*, 8 = *advanced*) assessing the participant's overall perceived suicide competence. The SCAF demonstrated good to excellent internal consistency across samples of clinical psychology trainees (α = 0.82–0.93; Cramer et al., 2020; Lund et al., 2016; Monahan & Karver, 2021). The SCAF also demonstrated high construct validity (Cramer et al., 2020). The measure also demonstrated acceptable to excellent internal consistency across the three time points in the current sample (α = 0.77–0.90).

Suicide Intervention Skills

Suicide Intervention Response Inventory-Revised (SIRI-2; Neimeyer & Bonnelle, 1997). The SIRI-2 is a 48-item measure assessing suicide intervention skills by determining the appropriateness of respondents' selected prompts in response to sample statements made by hypothetical suicidal clients (Neimeyer & Bonnelle, 1997; see Appendix D). The measure has been used widely to assess suicide intervention skills and changes in those skills (e.g., Pasco et al., 2012; Shannonhouse et al., 2018). At pre-training, post-training, and 3-month follow-up,

participants were presented with 24 statements that a person at risk of suicide might make to a caregiver, and each statement was followed by two possible caregiver responses to the statement (Neimeyer & Bonnelle, 1997). Participants rated the appropriateness of each response on a 7-point Likert scale (-3 = *highly inappropriate*, +3 = *highly appropriate*). Total scores are calculated by summing up the deviations between participant ratings and the consensus ratings of a criterion group of suicidology experts. Lower SIRI-2 scores, or fewer discrepancies from the consensus ratings, represent better suicide intervention skills—the theoretical range of scores with this method is 13.15 to 243.10, assuming participants rate all of the prompts closest to or furthest from the consensus ratings, respectively. The SIRI-2 has previously demonstrated acceptable to excellent internal consistency across studies (α = 0.75–0.93; Monahan & Karver, 2021; Scheerder et al., 2010; Shannonhouse et al., 2018). The measure has also shown high test-retest reliability (r = 0.91, Shannonhouse et al., 2018) as well as construct and convergent validity (Mackelprang et al., 2014; Scheerder et al., 2010). The SIRI-2 also demonstrated good internal consistency across the three time points in the current sample (α = 0.82–0.87).

It is of note that, in light of the limitations with the original scoring, alternative SIRI-2 scoring methods have been proposed that involve calculating separate underestimation (SIRI-2-Under) and overestimation subscores (SIRI-2-Over) (Shannonhouse et al., 2018). The current study used both original scoring and alternative scoring methods. The SIRI-2-Under subscore accounts for the sum of deviations between participant and expert ratings in which the participant underestimated the harmfulness or helpfulness of a caregiver response prompt. Conversely, the SIRI-2-Over subscore accounts for the sum of deviations between participant and expert ratings in which the participant overestimated the harmfulness or helpfulness of a response. Similar to the interpretation of traditional SIRI-2 scores, lower SIRI-2-Under and SIRI-2-Over subscores

represent better suicide intervention skills. Although specific items attributed to the SIRI-2-Under and SIRI-2-Over subscores can vary across participants, adequate test-retest reliability for both subscores has been demonstrated (r = 0.94 and 0.77, respectively; Shannonhouse et al., 2018). In the present study, test-retest reliability estimates were calculated from pre-training to post-training and pre-training to 3-month follow-up. Adequate test-retest reliability was demonstrated for both the SIRI-2-Under and SIRI-2-Over subscores (pre- to post-training: r = 0.76–77; pre-training to 3-month follow-up: r = 0.73–0.79).

Attitudes Toward Suicide

Suicide Behavior Attitude Questionnaire (SBAQ; Botega et al., 2005; 2007). The SBAQ is a 16-item measure assessing attitudes toward suicide (see Appendix E). The measure includes three subscales: feelings toward a suicidal patient (FSP), professional capacity in responding to a suicidal patient (PCR), and beliefs about an individual's right to suicide (RS). The range of scores for these subscales are 0 to 700, 0 to 400, and 0 to 500, respectively. For the FSP and PCR subscales, higher scores indicate positive or adaptive feelings toward suicidal patients and greater perceived professional capacity in responding to such patients. Conversely, for the RS subscale, higher scores indicate more condemnatory attitudes (e.g., believing that a suicidal person does not have the right to attempt suicide). At pre- and post-training, and 3-month follow-up, participants rated their level of agreement with statements about attitudes toward suicide (e.g., "Honestly, I prefer not to get involved with patients who attempted suicide") on a visual analog scale (VAS), ranging from 0 (*strongly disagree*) to 100 (*strongly agree*). The subscales have previously demonstrated acceptable internal consistency (α = 0.50–0.74; Botega et al., 2005; 2007; Cramer et al., 2019). In the present study, the PCR subscale demonstrated acceptable to good internal consistency across the three assessment points (α =

0.68–0.84). The FSP and RS subscales showed poor internal consistency in the current sample (α = 0.22–0.66; α = 0.37–0.49, respectively).

Suicide-Related Clinical Experiences

Clinical Experience Questionnaire (CEQ; Adapted from Elston et al., 2019). This 18-item measure was adapted from items used by Elston et al. (2019) to assess suicide-related clinical experiences (see Appendix F). At the 3-month follow-up, participants were asked to indicate the number of hours and format of additional suicide risk assessment or intervention training they received since the post-training assessment; total accrued clinical hours; number of clients with suicide risk in their caseload; and perceived effectiveness of suicide intervention strategies employed with those clients.

Cultural Sanctions of Suicide

Cultural Assessment of Risk for Suicide, Cultural Sanctions of Suicide Subscale (CARS; Chu et al. 2013). The CARS is a 39-item measure assessing cultural risk factors of suicide among ethnically and sexually minoritized groups in response to the growing need for culturally responsive risk assessment practices (Chu et al., 2013). The measure includes four categories that capture unique aspects of the cultural theory of suicide (Chu et al., 2010)—that is: social discord, minority stress, idioms of distress, and cultural sanctions. For the present study, participants rated four items from the cultural sanctions subscale of this measure at pre-training (see Appendix G). These four items assess individuals' perceived, familial, or societal messages about the acceptability of suicide within one's cultural groups and/or identities. Participants rated the degree to which each statement applied to them on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*). Items were reverse-scored. Total scores range from 4 to 24 with lower scores indicating lower acceptability of suicide within one's cultural groups and/or

identities. The cultural sanctions subscale has demonstrated acceptable internal consistency (α = 0.65) in a prior study (Chu et al., 2013) as well as in the current sample (α = 0.72).

Data Analysis

Missing Data

Missing data were inspected at each time point, and the range of missing data across primary study variables was 0–4% for pre-training, 9–13% for post-training, and 16–20% for 3-month follow-up. Little's missing completely at random (MCAR) test (1988) was conducted, and the result was not significant, suggesting that missing data were MCAR, $X^2(592, n = 56) = 125.35$, $p = 1.00$. Based on separate variance *t*-tests and chi-squared tests, there were no significant associations between the presence of missing data for a given variable and observed values of other variables. This finding further supported that missing data were MCAR. While complete-case analysis based on listwise or pairwise deletion produces unbiased estimates under an MCAR assumption (Zhang et al., 2019), those approaches would lead to lower statistical power. Therefore, multiple imputation was performed using SPSS version 29 (IBM Corp, 2023). Based on guidelines for missing data from Enders (2010) and van Buuren (2018), supplemental information about the rationales for the chosen missing data technique and steps taken to perform multiple imputation are outlined in Appendix H. Ten multiply imputed datasets were created, and all measures with missing data (i.e., CARS, SCI, SCAF, SIRI2, SBAQ, and CEQ) were imputed at the item-level under fully conditional specification using the Markov Chain Monte Carlo method. Preliminary and primary analyses were conducted using the multiply imputed dataset, and results from each of the ten datasets were pooled using Rubin's rules (1987).

Preliminary Analyses

Bivariate correlations were performed between all time-invariant predictor variables to

assess for multicollinearity. Adjusted generalized variance inflation factors (GVIF) were calculated to further assess multicollinearity. Other key assumptions for multilevel models—including linearity, normality of residuals, and homoscedasticity—were examined using histograms, scatterplots, and quantile-quantile (Q-Q) plots. Visual inspection indicated that the study data met the assumptions.

Primary Analyses

Primary analyses were performed using the R (version 4.3.2; R Core Team, 2023) packages lme4 (Bates et al., 2015), lmerTest (Kuznetsova et al., 2017), mice (van Buuren & Groothuis-Oudshoorn, 2011), and mitml (Grund et al., 2023). Multilevel modeling (MLM) was employed to account for the nesting of repeated assessments within individual trainees. MLM has been shown to provide greater statistical power and is more flexible (e.g., not requiring the assumption of sphericity) than repeated measures analysis of variance (Quené & van den Burgh, 2004). In MLM analyses, time (pre-training vs. post-training; pre-training vs. 3-month follow-up) was included as a Level 1 (i.e., assessment-level) predictor, group (experimental vs. nonequivalent-control) was included as a Level 2 (i.e., person-level) predictor, and group by time interaction was included as a cross-level interaction. Time effect represented whether there was a significant change in outcome variables over time (i.e., from pre- to post-training; from pre-training to 3-month follow-up) at the sample level, or across experimental and control groups. Group effect represented whether there was a significant group difference in the levels of outcome variables aggregated across time (i.e., pre- to post-training, or pre-training to 3-month follow-up). The interaction term was of primary interest in that it provided a test of whether the degree of change in an outcome variable over time significantly varied between groups. Outcome variables were the SCI, SCAF, SIRI-2, and SBAQ total and subscale scores. For each outcome,

two separate models were analyzed: one examining changes from pre- to post-training and another examining changes from pre-training to 3-month follow-up. In models testing for changes from pre- to post-training, sex assigned at birth and cultural sanctions scores were included as Level 2 covariates. In models testing for changes from pre-training to 3-month follow-up, three additional covariates assessed at the 3-month follow-up were included (i.e., the number of accrued clinical hours, the number of clients appearing at risk of suicide, and the number of clients endorsing suicidal ideation). Continuous covariates were grand-mean centered to allow for the model intercept to be more interpretable. The 'mitml' R package (Grund et al., 2023) was used to obtain the pooled parameter estimates from MLM analyses. Based on guidelines on applying MLM to multiple imputation data (Barnard & Rubin, 1999; Snijders & Bosker, 2012), complete-data degrees of freedom were set to account for small-sample hypothesis testing. Significant group-by-time interactions were followed up by simple slopes analyses to examine changes in outcome measures over time for each group separately. Cohen's *d* (1988) was calculated as a measure of effect size for all models based on Feingold (2009, 2015).

Results

Preliminary Analyses

Table 2 presents bivariate correlations between time-invariant predictor variables. Higher cultural sanction scores (i.e., higher acceptability of suicide in one's cultural groups) were positively correlated with accrued clinical hours, $r(168) = .181$, $p = .019$, and the number of clients appearing at risk of suicide in one's caseload, $r(168) = .158$, $p = .048$. Accrued clinical hours were also positively correlated with the number of clients appearing at risk of suicide, $r(168) = .276$, $p < .001$, and the number of clients endorsing suicidal ideation in one's caseload,

$r(168) = .239$, $p = .002$. Last but not least, the number of clients appearing at risk of suicide and the number of clients endorsing suicidal ideation in one's caseload were positively correlated, $r(168) = .599$, $p < .001$. Adjusted GVIF results ranged from 1.089 to 1.318 across predictor variables—considering the guideline that GVIF values greater than 10 are indicative of multicollinearity, results suggest that multicollinearity was not present.

Descriptive statistics were also calculated for outcome measures. Table 3 presents pooled means and standard deviations for each outcome measure at pre-training, post-training, and 3-month follow-up.

Efficacy of ASIST: Pre- to Post-Training Change

Perceived Competence and Knowledge

Table 4 presents pooled results of multilevel analyses examining pre- to post-training changes in outcome measures. For SCI total scores, the effect of time was significant, $t(105.77) = 2.19$, $p = .009$, $d = 0.84$, indicating that across two groups, there was a significant improvement in perceived suicide-related competence from pre- to post-training. A similar pattern of results was found for the subscale scores on perceived competence and willingness to assess for suicide, $t(85.88) = 2.35$, $p = .021$, $d = 0.73$; $t(104.90) = 2.64$, $p = .010$, $d = 0.82$, but not for the willingness to treat suicide, $t(106.51) = 0.64$, $p = .530$, $d = 0.07$. The effect of group was significant on SCI total scores, $t(50.10) = -2.78$, $p = .008$, $d = -0.79$, such that when aggregating across pre- and post-training assessments, control participants reported higher perceived suicide-related competence than experimental participants. Significant effects of group were also found for willingness to treat suicide and perceived competence, $t(50.02) = -2.39$, $p = .021$, $d = -0.68$; $t(50.02) = -3.22$, $p = .002$, $d = -0.73$, but not for willingness to assess for suicide, $t(50.05) = -1.38$, $p = .174$, $d = -0.40$. Significant group-by-time interaction effects were found on SCI total

scores, $t(108.23) = 2.47$, $p = .015$, $d = 1.28$, and perceived competence, $t(101.75) = 4.11$, $p < .001$, $d = 1.35$. Based on simple slopes analyses, both experimental and control groups experienced significant improvements on SCI total scores over time, but the degree of change was larger for the experimental group, $\beta = 5.41$, $t(54) = 5.34$, $p < .001$, than for the control group, $\beta = 2.19$, $t(54) = 2.66$, $p = .010$. Results on the perceived competence subscale were consistent, in which the experimental group experienced a greater improvement over time, $\beta = 2.59$, $t(54) = 7.41$, $p < .001$, than the control group, $\beta = 0.70$, $t(54) = 2.35$, $p = .022$. No significant interaction effects were observed for willingness to treat suicide, $t(108.48) = 1.23$, $p = .220$, $d = 0.76$, or willingness to assess for suicide, $t(107.94) = 0.34$, $p = .735$, $d = 0.36$.

When examining the SCAF, the effect of time was significant for SCAF total scores, $t(101.69) = 2.13$, $p = .036$, $d = 0.73$, but not for SCAF global scores, $t(83.94) = 0.56$, $p = .580$, $d = 0.16$. Both outcome measures demonstrated significant group effects with large effect sizes—that is, the control group reported greater perceived suicide-related competence than the experimental group across pre- and post-training based on SCAF total, $t(50.05) = -3.97$, $p < .001$, $d = -0.95$, and SCAF global scores, $t(48.25) = -5.18$, $p < .001$, $d = -1.10$. Significant group-by-time interactions were observed on both SCAF total, $t(106.91) = 6.01$, $p < .001$, $d = 1.68$, and SCAF global scores, $t(78.78) = 6.49$, $p < .001$, $d = 1.91$. Based on simple slopes analyses, both experimental and control groups experienced significant increases in SCAF total scores from pre- to post-training, but the degree of improvement was larger for the experimental group, $\beta = 8.96$, $t(54) = 9.52$, $p < .001$, than for the control group, $\beta = 1.64$, $t(54) = 2.13$, $p = .04$. For the SCAF global score, only the experimental group experienced a significant improvement from pre- to post-training, $\beta = 2.40$, $t(54) = 8.99$, $p < .001$. The control group did not experience a significant change, $\beta = 0.12$, $t(54) = 0.56$, $p = .581$.

Suicide Intervention Skills

There was no significant pre- to post-training change across groups on overall SIRI-2 scores, $t(97.69) = -1.58$, $p = .118$, $d = -0.42$, and SIRI-2-Under subscores, $t(83.99) = 0.490$, $p = .625$, $d = 0.18$. However, there was a significant improvement across groups on the SIRI-2-Over subscores, $t(101.04) = -2.12$, $p = .037$, $d = -0.59$; that is, participants became less likely to overestimate the helpfulness or harmfulness of responses to hypothetical statements made by suicidal clients. When aggregating across pre- and post-training scores, there were no significant group differences on overall SIRI-2 scores, $t(49.84) = 1.64$, $p = .108$, $d = 0.43$; SIRI-2-Under subscores, $t(49.51) = 1.37$, $p = .178$, $d = 0.36$; or SIRI-2-Over subscores, $t(49.90) = 0.72$, $p = .477$, $d = 0.18$. Similarly, no significant group by time interactions were found for overall SIRI-2 scores, $t(105.67) = -0.11$, $p = .910$, $d = -0.06$; SIRI-2-Under subscores, $t(101.06) = 0.88$, $p = .378$, $d = 0.21$; or SIRI-2-Over subscores, $t(106.71) = -0.85$, $p = .396$, $d = -0.23$.

Attitudes Toward Suicide

There was a significant increase from pre- to post-training across groups on self-reported professional capacity to treat suicide (SBAQ PCR), $t(107.41) = 2.12$, $p = .037$, $d = 0.58$. There were no significant changes across groups on feelings toward suicidal patients (SBAQ FSP), $t(106.89) = 0.77$, $p = .445$, $d = 0.21$; or rights of individuals to attempt suicide (SBAQ RS), $t(107.44) = 0.65$, $p = .517$, $d = 0.18$. The effect of group was significant for professional capacity to treat suicide such that the control group had higher scores than the experimental group when aggregating across pre- and post-training, $t(50.06) = -3.75$, $p < .001$, $d = -0.89$. There were no significant group differences on the SBAQ FSP, $t(50.09) = 1.95$, $p = .057$, $d = 0.43$; or SBAQ RS subscales, $t(49.87) = 1.65$, $p = .104$, $d = 0.40$. A significant group by time interaction was found for professional capacity to treat suicide (SBAQ PCR), $t(108.80) = 5.44$, $p < .001$, $d = 1.48$.

Based on simple slopes analyses, although both experimental and control groups experienced significant improvements over time, the degree of improvements was greater for the experimental group, $\beta = 26.67$, $t(54) = 8.70$, $p < .001$, than for the control group, $\beta = 5.23$, $t(54) = 2.12$, $p = .039$. No significant interactions were observed for feelings toward suicidal patients (SBAQ FSP), $t(108.62) = -1.30$, $p = .195$, $d = -0.36$; or rights of individuals to attempt suicide (SBAQ RS), $t(108.82) = -1.13$, $p = .260$, $d = -0.31$.

Maintenance of Gains: Pre-Training to 3-month Follow-Up Change

Perceived Competence and Knowledge

Table 5 presents pooled results of multilevel analyses examining pre-training to 3-month follow-up changes in outcome measures. For SCI total scores, the effect of time was significant, $t(100.35) = 3.14$, $p = .002$, $d = 0.87$, indicating that across two groups, there was a significant improvement in perceived suicide-related competence from pre-training to 3-month follow-up. A similar pattern of results was found for the perceived competence and willingness to assess for suicide subscales, $t(85.81) = 3.09$, $p = .003$, $d = 0.87$; $t(103.05) = 2.23$, $p = .028$, $d = 0.56$, but not for the willingness to treat suicide subscale, $t(101.33) = 1.25$, $p = .215$, $d = 0.34$. The effect of group was significant on SCI total scores, $t(46.40) = -2.92$, $p = .005$, $d = -0.83$, such that when aggregating across pre-training and 3-month follow-up assessments, control participants reported higher perceived suicide-related competence than experimental participants. Significant effects of group were also found for willingness to treat suicide and perceived competence, $t(46.19) = -2.52$, $p = .015$, $d = -0.76$; $t(46.57) = -3.26$, $p = .002$, $d = -0.73$, but not for willingness to assess for suicide, $t(46.30) = -1.40$, $p = .169$, $d = -0.40$. A significant group by time interaction was found on perceived competence, $t(95.60) = 3.09$, $p = .003$, $d = 0.87$. Based on simple slopes analyses, both experimental and control groups experienced significant improvements on

perceived competence over time, but the degree of change was larger for the experimental group, β = 2.53, $t(54) = 6.51$, $p < .001$, than for the control group, β = 0.98, $t(54) = 3.09$, $p = .003$. No significant interaction effects were observed for SCI total scores, $t(101.60) = 1.63$, $p = .107$, $d = 0.58$; willingness to treat suicide, $t(103.57) = 0.98$, $p = .327$, $d = 0.45$; or willingness to assess for suicide, $t(101.81) = -0.04$, $p = .966$, $d = 0.01$.

When examining the SCAF, the effect of time was significant for SCAF total scores, indicating significant improvements from pre-training to 3-month follow-up across groups, $t(105.01) = 4.73$, $p < .001$, $d = 1.28$, but not for SCAF global scores, $t(77.97) = 1.33$, $p = .188$, $d = 0.39$. Both outcome measures demonstrated significant group effects—that is, the control group reported greater perceived suicide-related competence than the experimental group across pre-training and 3-month follow-up based on SCAF total, $t(46.54) = -4.33$, $p < .001$, $d = -1.06$, and SCAF global scores, $t(44.38) = -5.08$, $p < .001$, $d = -1.04$. Significant group-by-time interactions were observed on both SCAF total, $t(99.99) = 4.94$, $p < .001$, $d = 1.43$, and SCAF global scores, $t(95.83) = 5.31$, $p < .001$, $d = 1.50$. Based on simple slopes analyses, both experimental and control groups experienced significant increases in SCAF total scores from pre-training to 3-month follow-up, but the degree of improvement was larger for the experimental group, β = 9.29, $t(54) = 10.12$, $p < .001$, than for the control group, β = 3.450, $t(54) = 4.73$, $p < .001$. For the SCAF global score, only the experimental group experienced a significant improvement from pre-training to 3-month follow-up, β = 2.16, $t(54) = 7.93$, $p < .001$. The control group did not experience a significant change, β = 0.302, $t(54) = 1.33$, $p = .190$.

Suicide Intervention Skills

There was no significant pre-training to 3-month follow-up change across groups on overall SIRI-2 scores, $t(95.07) = -1.28$, $p = .205$, $d = -0.36$. However, there was significant

improvement across groups on the SIRI-2-Over subscores, $t(102.10) = -3.13$, $p = .002$, $d = -0.91$; that is, participants overall maintained their improvement from pre-training in becoming less likely to overestimate the helpfulness or harmfulness of responses to hypothetical statements made by suicidal clients. There was also a significant increase (i.e., worse performance) across groups on SIRI-2-Under subscores, $t(94.61) = 2.28$, $p = .025$, $d = 0.77$; participants across both groups underrated the helpfulness and harmfulness of responses to a greater degree over time. When aggregating across pre- and post-training scores, there were no significant group differences on overall SIRI-2 scores, $t(46.49) = 1.40$, $p = .169$, $d = 0.40$; SIRI-2-Under subscores, $t(45.95) = 0.89$, $p = .379$, $d = 0.25$; or SIRI-2-Over subscores, $t(46.71) = 0.87$, $p = .388$, $d = 0.24$. A significant group-by-time interaction was found on SIRI-2-Under scores, $t(100.94) = 2.51$, $p = .014$, $d = 0.65$. Based on simple slopes analyses, both experimental and control groups experienced significant increases (i.e., worse performance) on SIRI-2-Under subscores over time, and the degree of change was larger for the experimental group, $\beta = 7.73$, $t(54) = 4.96$, $p < .001$, than for the control group, $\beta = 2.82$, $t(54) = 2.28$, $p = .027$. No significant group by time interactions were found for overall SIRI-2 scores, $t(87.61) = 0.28$, $p = .781$, $d = 0.07$, or SIRI-2-Over subscores, $t(104.38) = -1.78$, $p = .077$, $d = -0.42$.

Attitudes Toward Suicide

There was a significant increase from pre-training to 3-month follow-up across groups on professional capacity to treat suicide (SBAQ PCR), $t(107.88) = 3.46$, $p = .001$, $d = 0.94$. There were no significant changes across groups on feelings toward suicidal patients (SBAQ FSP), $t(107.50) = -0.29$, $p = .769$, $d = -0.08$; or rights of individuals to attempt suicide (SBAQ RS), $t(106.57) = -0.20$, $p = .839$, $d = -0.06$. The effect of group was significant for professional capacity to treat suicide such that the control group had higher scores than the experimental

group when aggregating across pre-training and 3-month follow-up, $t(46.90) = -3.64$, $p = .001$, $d = -0.89$. The effect of group was also significant for feelings toward suicidal patients and rights of individuals to attempt suicide such that the experimental group had more positive attitudes towards suicidal patients and individuals' right to attempt suicide than the control group when aggregating across pre-training and 3-month follow-up, $t(46.46) = 2.26$, $p = .029$, $d = 0.53$; $t(46.67) = 2.23$, $p = .030$, $d = 0.55$. A significant group by time interaction was found for professional capacity to treat suicide (SBAQ PCR), $t(108.58) = 4.28$, $p < .001$, $d = 1.17$. Based on simple slopes analyses, although both experimental and control groups experienced significant improvements over time, the degree of improvement was greater for the experimental group, $\beta = 26.40$, $t(54) = 8.26$, $p < .001$, than for the control group, $\beta = 8.86$, $t(54) = 3.46$, $p = .001$. No significant interactions were observed for feelings toward suicidal patients (SBAQ FSP), $t(108.48) = -1.67$, $p = .097$, $d = -0.46$; or rights of individuals to attempt suicide (SBAQ RS), $t(108.21) = 0.12$, $p = .905$, $d = 0.03$.

Discussion

Suicide intervention is a uniquely complex matter. It poses logistical, ethical, and emotional risks in terms of its effective implementation among the highly vulnerable population of persons experiencing suicidal thoughts and behaviors. The field of suicide intervention and prevention has progressed extensively since Dr. Edwin Schneidman—one of the pioneers of suicidology, or the scientific study of suicide—founded the AAS in 1968. For instance, even within the present millennium, the rates of suicide-related training within clinical psychology doctoral programs have risen drastically (Dexter-Mazza & Freeman, 2003; Monahan & Karver, 2021). At the same time, clinicians and other healthcare personnel continue to navigate rising trends of fatal suicide attempts both in the United States (CDC, 2024) and globally—particularly

in low- and middle-income regions (Yip et al., 2022). The current quasi-experimental study examined the efficacy of a manualized suicide intervention training protocol, ASIST, among clinical psychology doctoral trainees. The present findings are a meaningful addition to the literature in that there has been surprisingly minimal research on the efficacy of suicide-related training among clinical psychology doctoral trainees despite their frequent encounters with suicidal clients over the course of their training.

Overall, the current results indicated the efficacy of ASIST in improving perceived suicide-related competence and knowledge. The experimental group consisting of trainees who completed ASIST demonstrated significant improvements—to a greater degree than the nonequivalent-control group who did not complete ASIST—from pre- to post-training on perceived suicide-related competence and knowledge. Greater improvements in the experimental group relative to the control group were maintained at the 3-month follow-up. The same pattern of results was observed across multiple measures of perceived competence and knowledge (SCI, SCAF, and SBAQ subscale on professional capacity to treat suicidal clients). On the contrary, the effects of ASIST were largely non-significant on suicide intervention skills and attitudes towards suicide in the current study. The experimental group did not demonstrate greater improvements on suicide intervention skills from pre- to post-training compared to the control group. Rather, by the 3-month follow-up assessment, both groups experienced a significant reduction in their tendency to overestimate—but a significant increase in their tendency to underestimate—the beneficence or maleficence of responses to suicidal individuals. In other words, both groups became overly conservative in gauging the helpfulness or harmfulness of verbal responses to suicidal individuals. Surprisingly, the degree of an increase in the underestimation bias was significantly greater in the experimental group compared to the control

group. Lastly, neither the experimental group nor the control group demonstrated significant changes over time in feelings toward suicidal patients or degree of adaptive beliefs about individuals' rights to attempt suicide.

Our current results on the efficacy of ASIST in improving perceived suicide-related competence and knowledge are consistent with prior findings. Clinicians and master's-level trainees who completed ASIST attained greater perceived suicide-related competence (e.g., higher self-ratings on one's competence with responding to individuals at risk of suicide) and suicide-related knowledge relative to baseline (Griesbach et al., 2008; Shannonhouse, Lin, Shaw, & Porter, 2017; Shannonhouse, Lin, Shaw, Wanna, & Porter, 2017; Shannonhouse et al., 2018). It is noteworthy that the control group initially presented with higher levels of perceived suicide-related competence and knowledge as assessed by the SCI, SCAF, and SBAQ PCR subscale than the experimental group at baseline. However, the experimental group caught up to the control group by post-training and 3-month follow-up. One possibility is that the experimental group started at very low levels of perceived competence and knowledge, or the control group started at very high levels, such that the greater improvements over time in the experimental group relative to the control group were driven by regression toward the mean. However, this was not the case because the experimental group's baseline scores on the aforementioned measures were above the "floor" or the possible minimum scores. In fact, some of the measures indicated moderate levels of competence and knowledge for the experimental group at baseline. Similarly, the control group's scores were distant from the "ceiling" or the possible maximum scores on the measures, leaving sufficient room for change. That said, prior studies on the ASIST have shown its benefits for individuals with minimal or no suicide-related competence and skills (Shannonhouse, Lin, Shaw, & Porter, 2017; Shannonhouse et al., 2018). Present findings extend

the prior findings and suggest that the ASIST might also be beneficial for individuals who are already equipped with some levels of suicide-related competence and knowledge.

It is of note that even without an active intervention, the control group significantly improved on measures of perceived suicide-related competence and knowledge—albeit not to the same degree as the experimental group—within a relatively short period from pre- to post-training. Considering that most doctoral trainees nowadays report receiving suicide-related training (Monahan & Karver, 2021), the control group trainees might have received some form of orientation on suicide risk assessment and intervention (e.g., learning how to use a suicide screening instrument) at the outset of their first clinical practicum in the time between pre- and post-training. Alternatively, given their high perceived suicide-related competence and knowledge scores at baseline, control group trainees could have had a particular interest in suicide risk assessment and intervention—this may have facilitated gains in competence and knowledge over time for control group trainees especially since they elected to participate in the current study with an understanding that it focuses on suicide risk assessment and intervention.

One consideration around interpreting the current results is that trainees improved on perceived suicide-related competence (i.e., self-ratings), which is not necessarily equivalent to objective or observed competence (e.g., supervisors' evaluations of trainees' skills or knowledge). The construct of perceived competence can be understood based on self-determination theory, in which psychological needs, like one's competence, are vital for psychological growth, integrity, and well-being (Deci & Ryan, 2000). Although perceived competence may appear less meaningful than objective or observed competence, some studies have examined perceived competence in relation to clinical outcomes and yielded notable results. For instance, Hager et al. (2021) evaluated the efficacy of a suicide-related training based

on the core competence model of suicide prevention training (Cramer et al., 2013) among 21 university counseling and student health providers and found robust improvements in perceived competence and knowledge and corresponding increases in the frequency of mental health screening administrations—including screening of depressive symptoms, self-harm actions, and suicidal ideation—by these providers. McNiel et al. (2008) engaged 45 psychiatry and psychology trainees in a training about evidence-based suicide risk assessment and assessed trainees' perceived competence in suicide risk assessment; additionally, they assessed trainees' objective competence as measured by two independent clinicians' evaluation of trainees' progress notes for clinical vignettes of hypothetical suicidal clients. Findings from McNiel et al. (2008) indicated trainees' gains both in perceived competence and objective competence as demonstrated by improved clinical documentation quality such as better identification of risk and protective factors and the provision of rationales for risk management strategies. In addition, Almaliah et al. (2020) randomly assigned 331 mental health professionals to one of four case presentations depicting a hypothetical patient in crisis and found that perceived competence was the strongest predictor of the clinician's willingness to treat the patient and the likelihood of referring the patient elsewhere compared to factors like ethical responsibility and emotional contagion. These findings suggest that gains in perceived competence—although not necessarily indicative of improved objective competence—may still have important clinical implications for how trainees respond to clients endorsing suicidal thoughts or behaviors in their practice.

Contrary to the hypothesis, results did not provide support for ASIST's efficacy on suicide intervention skills. The lack of support is inconsistent with prior studies of ASIST that assessed suicide intervention skills (Shannonhouse, Lin, Shaw, Wanna, & Porter, 2017; Shannonhouse et al., 2018; Tierney, 1994; Turley et al., 2000). The discrepant finding in the

current study might be due to the sample being underpowered. For instance, at the 3-month follow-up assessment, the group by time interaction effect for SIRI-2-Over subscores was of moderate magnitude (based on Cohen's *d*) such that the experimental group improved to a greater degree than the control group in their accuracy of gauging the impact of different verbal responses to hypothetical clients at risk for suicide. However, this effect was non-significant under null hypothesis significance testing. Another explanation is related to the methods of assessing suicide intervention skills. Prior studies finding evidence for ASIST's efficacy on suicide intervention skills tended to employ simulation-based assessments. For example, Turley et al. (2000) found that a group of health professionals and laypersons in Australia who completed ASIST experienced significant improvements from pre- to post-training in their assessment of suicide risk and understanding of how to apply suicide intervention strategies in taped, mock scenarios of an individual at risk of suicide. Tierney (1994) found that ASIST trainees in Canada demonstrated significantly better performance in simulated suicide interventions (e.g., assessing risk factors and collaboratively developing action plans) than a comparison group of individuals who did not complete ASIST. However, results have been less conclusive based on the SIRI-2, a measure used in the current study. SIRI-2 is a self-administered questionnaire assessing respondents' ability to select appropriate therapeutic responses to suicidal statements (Neimeyer & Pfeiffer, 1994). Sareen et al. (2013) did not observe significant changes in SIRI-2 scores among Canadian tribal community members who completed ASIST compared to an active control condition who completed a "resilience retreat" led by respected and experienced tribal community leaders. Neither Shannonhouse, Lin, Shaw, Wanna, & Porter (2017) nor Shannonhouse et al. (2018) found evidence for ASIST efficacy based on SIRI-2 total scores. Given the similar null finding in the current study, the SIRI-2,

although widely used as a measure of suicide intervention skills (e.g., Pasco et al., 2012; Mackelprang et al., 2014; Scheerder et al., 2010), may not capture the types of suicide intervention skills that are most impacted by the ASIST.

Interestingly, two prior studies found a significant effect of ASIST based on novel SIRI-2 subscores assessing the degree to which respondents over- or underestimate the appropriateness of verbal responses to suicidal statements. Shannonhouse et al. (2018) found that master's-level counselors in training who completed ASIST experienced a significant reduction in their degree of underestimating helpfulness or harmfulness of verbal responses—albeit worsening of an overestimation bias—as compared to the control group who did not complete ASIST. The same pattern of findings was observed in a sample of university employees (Shannonhouse, Lin, Shaw, Wanna, & Porter, 2017). The current study found an opposite pattern of findings where clinical psychology doctoral trainees who completed ASIST demonstrated worsening of their underestimation bias relative to those who did not complete ASIST, yet both groups showed a reduction in their overestimation bias over time. While the specific subscore findings are at odds with prior findings, both the current result and prior findings suggest that ASIST trainees might initially lack the nuance possessed by suicide intervention experts in evaluating the beneficence or maleficence of responses to suicidal statements. This initial lack of nuanced assessment capabilities among trainees could amount to variations in underestimation and overestimation subscores on the SIRI-2 and subsequently change in response to a training such as ASIST. Furthermore, the current results also demonstrate the utility of using an alternative scoring method of SIRI-2 suggested by Shannonhouse et al. (2018). In the present study, significant suicide intervention skill changes (although differing from the hypothesized direction of changes) were only observed based on the alternative SIRI-2 subscores, but not on the traditional

SIRI-2 total scores. This result also echoes calls from Shannonhouse et al. (2018) for a comprehensive revision of the SIRI-2. Possible revisions could include adjusting the setting and nature of hypothetical suicidal statements and response prompts; for example, one section could replicate a psychiatric hospital experience of interviewing clients on an inpatient unit. Additionally, a revised version of the SIRI-2 would benefit from a modern panel of expert suicidologists to attain updated expert criterion scores. Another consideration is that more recent measures of suicide intervention skills—such as the Suicide Counseling Skills Inventory (Coohey et al., 2022)—have shown preliminary support in more accurately detecting ASIST's efficacy on suicide intervention skills at post-training as compared to the SIRI-2. It might be beneficial for future studies testing ASIST's efficacy to employ a more diverse set of measures on suicide intervention skills to capture training effects with greater sensitivity.

Present findings did not provide consistent support for ASIST's efficacy in changing attitudes toward suicide. The experimental group demonstrated a greater improvement than the control group over time in relation to their professional capacity to respond to a suicidal patient, but not in relation to feelings toward a suicidal patient or beliefs about an individual's right to suicide. The current finding should be interpreted in consideration of the multifaceted nature of attitudes towards suicide. For instance, recent studies on ASIST (Shannonhouse, Lin, Shaw, Wanna, & Porter, 2017; Shannonhouse et al., 2018) have shown that the training led to improvements in self-reported helpful attitudes (e.g., belief about whether suicide is preventable) about suicide as measured by training surveys from the Youth Suicide Prevention Program from Organizational Research Services (ORS, 2002). It is possible that some of the specific dimensions of attitude towards suicide as assessed in the current study might be less relevant to the ASIST contents than other dimensions. It is also of note that based on a recent systematic

review (Holmes et al., 2021), the literature on the effects of suicide-related training programs on attitudes toward suicide remains mixed. While some studies found significant attitudinal changes resulting from training (e.g., Chagnon et al., 2007; Indelicato et al., 2011), other studies found a lack of enduring changes on attitudes toward suicide (e.g., Mitchell et al., 2013) as demonstrated by the return to baseline or pre-training levels anywhere between 1 and 24 months following training. Therefore, there remains a question about the efficacy of suicide-related training programs in changing individuals' attitudes toward suicide. Another consideration is the poor internal consistency of two subscales in the SBAQ used to assess attitudes toward suicide (Botega et al., 2005; 2007). In the current sample, while the SBAQ total score and the subscale on professional capacity to treat suicidal clients demonstrated acceptable internal consistency, the subscales assessing feelings toward suicidal patients and beliefs about an individual's right to suicide were poor. Given the low reliability of those subscales, the non-significant findings on the ASIST's effects on attitudes toward suicide should be interpreted with caution. Despite the SBAQ's use in prior studies on suicide-related training (e.g., Cramer et al., 2019), the measure may be better tailored to the original population it was validated on (i.e., healthcare personnel at a hospital in Brazil; Botega et al., 2005). The subscale measuring respondents' beliefs on individuals' right to die by suicide might be also more relevant to different contexts than psychological services (e.g., physician-assisted death). Based on a systematic review (Kodaka et al., 2011), several other measures on attitudes toward suicide have also shown less than acceptable internal consistency. This finding suggests challenges in identifying a set of items on attitudes toward suicide that produce coherent responses. Given the lack of consensus within the field of suicide research on the most effective methods to assess attitudes toward suicide, improving measurement tools for this construct remains an important area for future research.

The present findings provide several implications for suicide-related training of psychology doctoral students. Regarding the timing of training, Shannonhouse, Lin, Shaw, and Porter (2017) and Shannonhouse et al. (2018) suggested that the benefits of ASIST training might be greatest among trainees with minimal prior suicide-related training—the current results extend the prior findings and demonstrate benefits of ASIST for trainees with higher baseline levels of perceived suicide-related competence and knowledge. As such, one implication is that implementing this type of training earlier in a doctoral trainee's education (e.g., before their first clinical practicum) might be maximally beneficial and avail trainees of meaningful opportunities to practice suicide risk assessment and intervention in a supervised clinical setting. In addition, given that the current findings provide substantial support for the efficacy of ASIST on perceived competence and knowledge, it would be beneficial to better understand the extent to which trainees' perceived competence and knowledge translate to observed or objective competence, as well as positive clinical outcomes of clients. One tangible idea would be to augment the ASIST with the Objective Structured Clinical Examination (OCSE) methodology (Miller, 2010). Traditionally used in medical student training, the OSCE method involves trainees engaging with standardized hypothetical or mock clinical scenarios, and expert clinicians provide ratings of the trainees' performance (Miller, 2010). This method has been previously adapted for use in the context of suicide-related training (Cramer et al., 2013) and would add to a training model like ASIST systematic evaluations and feedback on trainees' performance by trainers. Such data points can also be directly compared with trainee's self-ratings on their performance. Another way to bolster suicide-related training for psychology doctoral students is to expand on training content related to attitudes toward suicide. Prior studies have demonstrated that increased positive attitudes toward suicide and higher levels of perceived spiritual support predict greater

self-efficacy and higher intent to conduct suicide risk assessment with clients (Hendrix, 2023; Monahan & Karver, 2021). In light of the recent systematic review (Holmes et al., 2021) indicating a lack of enduring training effects on attitudes toward suicide, it is important to aim both for immediate attitudinal changes as well as long-term maintenance of the gains. Lastly, in considering specific training needs, Wright (2022) outlined models for differentiation between master's and doctoral-level psychology trainees including a greater emphasis on case conceptualization and breadth of assessment competence and training for doctoral-level trainees—this emphasis is vital as doctoral-level trainees are highly likely to interface with suicidal clients both during graduate training (Dexter-Mazza and Freeman, 2003) and in their future clinical practice (Rothes & Henriques, 2018; Trimble et al., 2000). To effectively prepare doctoral-level trainees for suicide risk assessment and intervention, it may be beneficial to feature a breadth of hypothetical real-world clinical scenarios with suicidal clients for trainees to practice suicide risk assessment, case conceptualization, and formulation of treatment plans.

The present study has several limitations. First, the sample size might have been underpowered for some of the analyses. While incentives such as monetary compensation were used to facilitate recruitment, the experimental group was recruited from one site due to logistical reasons, and a large portion of interested individuals was screened out from the control group to ensure matching with the experimental group on key characteristics (e.g., second-year doctoral students entering their first clinical practicum). Another limitation was the lack of random assignment. The experimental group was recruited at a university-based clinic that hosted the ASIST program, and for ethical and logistical reasons, all trainees recruited at the clinic were offered access to the ASIST. Given the quasi-experimental nature of the current study, definitive causal claims on the efficacy of ASIST cannot be made. The current findings

warrant replication using random assignment or a dynamic waitlist-control design to address this limitation. It is also uncertain how much experimental group trainees used what they learned from the ASIST over time to ensure the maintenance of gains and fidelity to the ASIST model. In light of this limitation, future studies may include adaptations such as offering the training to both trainees and their supervisors and including supervisors' intermittent prompts and evaluations of trainees in their use of ASIST skills (e.g., encouraging trainees to review the ASIST workbook and evaluating their use of the ASIST model in working with clients at risk).

In addition, the present study relied on self-report measures to assess trainee characteristics. While self-report measures have been widely used in prior studies on suicide-related training (e.g., Mackelprang et al., 2014; Monahan & Karver, 2021; Shannonhouse et al., 2018), there are potential limitations. For instance, some participants might have exhibited retrospective bias and provided inaccurate responses on certain items (e.g., items asking about the number of suicidal clients they saw since the last assessment) (Monahan & Karver, 2021). Moreover, augmenting self-report measures with observational or performance-based assessments could have provided a more valid assessment of suicide intervention skills. It is of note that the current study included attention checks in the online survey administered at each time point to identify participants with a potentially invalid response pattern. Out of 162 aggregated survey responses across the three time points, only 3 survey responses (1.85%) did not pass the attention check(s), ensuring the validity of most participants' responses. Another limitation was missing data due to participant attrition over time. However, an extensive missing values analysis was conducted, and results supported that there did not appear to be a systematic pattern of missingness, or significantly different rates of attrition across groups or based on participant characteristics (i.e., "missing completely at random"). Multiple imputation, a gold-

standard method for addressing missing data, was implemented. Missing data were imputed at the item level rather than the scale level to increase statistical power (Mazza et al., 2015).

Last but not least, the current sample was somewhat homogeneous, with most participants identifying as female, White, heterosexual, and non-Hispanic/Latino. The demographic make-up of the current sample was similar to the participant characteristics of prior studies assessing clinical psychology doctoral trainees (see Monahan & Karver, 2021). Unfortunately, this lack of diversity in part reflects the present state of the field of clinical psychology—over half of clinical psychology doctoral trainees identify as White (56%), and over three-quarters of clinical psychology doctoral trainees identify as female (79%) (American Psychological Association, 2023). Therefore, while the current findings may generalize to a subset of doctoral trainees, there remains a portion of doctoral trainees of diverse backgrounds, for whom the generalizability of these results might be limited.

Despite the limitations, the current study expanded on the growing body of literature on suicide-related training for psychology trainees. There has been a recent call to action for such research to specifically include doctoral trainees given the high likelihood of those trainees encountering suicidal clients during their clinical training (Dexter-Mazza & Freeman, 2003; Monahan & Karver, 2021). In fact, some trainees in the current sample reported working with clients appearing at risk or those endorsing suicidal thoughts and behaviors in the first three months of their initial clinical practicum. The current study is the first to examine the efficacy of ASIST—a manualized suicide intervention training program—among clinical psychology doctoral trainees. Results from the current study provide support for the efficacy of ASIST on doctoral trainees' perceived competence and knowledge, but not for suicide intervention skills or attitudes toward suicide. Findings from the current study and prior research suggest that trainees'

gains in perceived competence and knowledge—albeit not necessarily indicative of gains in objective competence and knowledge—are important to consider for how trainees respond to real-world clients endorsing suicidal thoughts or behaviors. It can also be beneficial to introduce suicide risk assessment and intervention training earlier in a doctoral trainee's education to afford trainees opportunities to practice suicide risk assessment and intervention in supervised settings. In conclusion, the current study demonstrated a positive impact of ASIST among clinical psychology doctoral trainees and further bolsters the case for implementing quality suicide intervention training programs in clinical psychology doctoral programs.

References

Almaliah, R. S., Ettinger, N., Levi, B. Y., & Gvion, Y. (2020). “Will you treat me? I’m suicidal!” The effect of patient gender, suicidal severity, and therapist characteristics on the therapist’s likelihood to treat a hypothetical suicidal patient. *Clinical Psychology & Psychotherapy*, *27*(3), 278–287. https://doi.org/10.1002/cpp.2426

American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct* (2002, amended effective June 1, 2010, and January 1, 2017). https://www.apa.org/ethics/code/index.aspx

American Psychological Association. (2023). *Graduate study in psychology: Demographics of psychology departments* [Interactive Data Tool].

Atay, B., & Serim-Yıldız, B. (2023). The other side of the hill: Counsellor trainees’ suicide literacy and stigmatising attitudes. *British Journal of Guidance & Counselling.* https://doi.org/10.1080/03069885.2023.2179597

Barnard, J., & Rubin, D. B. (1999). Small-sample degrees of freedom with multiple imputation. *Biometrika, 86*, 948–955.

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Batterham, P. J., Calear, A. L., & Christensen, H. (2013). The stigma of suicide scale: Psychometric properties and correlates of the stigma of suicide. *Crisis, 34*(1), 13–21. https://doi.org/10.1027/0227-5910/a000156

Blanchard, M., & Farber, B. A. (2020). "It is never okay to talk about suicide": Patients' reasons for concealing suicidal ideation in psychotherapy. *Psychotherapy Research: Journal of the*

Society for Psychotherapy Research, *30*(1), 124–136. https://doi.org/10.1080/10503307.2018.1543977

Bongar, B., & Harmatz, M. (1991). Clinical psychology graduate education in the study of suicide: Availability, resources, and importance. *Suicide and Life-Threatening Behavior, 21*(3), 231–244.

Botega, N. J., Reginato, D. G., da Silva, S. V., da Silva Cais, C. F., Rapeli, C. B., Mauro, M. L. F., Cecconi, J. P., & Stefanello, S. (2005). Nursing personnel attitudes towards suicide: The development of a measure scale. *Revista Brasileira de Psiquiatria, 27*(4), 315–318. https://doi.org/10.1590/S1516-44462005000400011

Botega, N. J., Silva, S. V., Reginato, D. G., Rapeli, C. B., Cais, C. F. S., Mauro, M. L. F., Stefanello, S., and Cecconi, J. P. (2007). Maintained attitudinal changes in nursing personnel after a brief training on suicide prevention. *Suicide and Life-Threatening Behavior, 37*(2), 145–153. https://doi.org/10.1521/suli.2007.37.2.145

Brown, G. K., Ten Have, T., Henriques, G. R., Xie, S. X., Hollander, J. E., & Beck, A. T. (2005). Cognitive therapy for the prevention of suicide attempts: A randomized controlled trial. *JAMA: Journal of the American Medical Association, 294*, 563–570. https://doi.org/10.1001/jama.294.5.563

Buhi, E. R., Goodson, P., & Neilands, T. B. (2008). Out of sight, not out of mind: Strategies for handling missing data. *American Journal of Health Behavior*, *32*(1), 83–92. https://doi.org/10.5993/AJHB.32.1.8

Calear, A. L., Batterham, P. J., & Christensen, H. (2014). Predictors of help-seeking for suicidal ideation in the community: Risks and opportunities for public suicide prevention campaigns. *Psychiatry Research, 219*, 525–530.

http://doi.org/10.1016/j.psychres.2014.06.027

Centers for Disease Control and Prevention. (2024). *Suicide prevention*. Centers for Disease Control and Prevention. https://www.cdc.gov/suicide/index.html

Cerel, J., Currier, G. W., & Conwell, Y. (2006). Consumer and family experiences in the emergency department following a suicide attempt. *Journal of Psychiatric Practice,* 12, 341–347. http://doi.org/10.1097/00131746-200611000-00002

Chagnon, F., Houle, J., Marcoux, I., & Renaud, J. (2007). Control-group study of an intervention training program for youth suicide prevention. *Suicide and Life-Threatening Behavior, 37*(2), 135–144. https://doi.org/10.1521/suli.2007.37.2.135

Chu, J. P., Goldblum, P., Floyd, R., & Bongar, B. (2010). A cultural theory and model of suicide. *Applied and Preventive Psychology, 14,* 25–40.

Chu, J., Floyd, R., Diep, H., Pardo, S., Goldblum, P., & Bongar, B. (2013). A tool for the culturally competent assessment of suicide: the Cultural Assessment of Risk for Suicide (CARS) measure. *Psychological assessment*, *25*(2), 424–434. https://doi.org/10.1037/a0031264

Chu, J., O'Neill, S. E., Ng, J. F., & Khoury, O. (2022). The cultural theory and model of suicide for youth. In: Ackerman, J. P. & Horowitz, L. M. (eds). Youth suicide prevention and intervention. *SpringerBriefs in Psychology.* Springer. https://doi.org/10.1007/978-3-031-06127-1_11

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Coleman, D., Noonan, D. G., & Millet, L. M. (2008). *Garrett Lee Smith Memorial Act Oregon youth suicide prevention and early intervention annual report 2007-2008*. Portland, OR:

Portland State University.

Coohey, C., Neblett, K., & Knox, S. (2022). Validation of the suicide counseling skills inventory. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *43*(3), 170–182. https://doi.org/10.1027/0227-5910/a000770

Cramer, R. J., Johnson, S. M., McLaughlin, J., Rausch, E. M., & Conroy, M. A. (2013). Suicide risk assessment training for psychology doctoral programs: Core competencies and a framework for training. *Training and Education in Professional Psychology*, *7*(1), 1–11. https://doi.org/10.1037/a0031836

Cramer, R. J., Long, M. M., Gordon, E., & Zapf, P. A. (2019). Preliminary effectiveness of an online-mediated competency-based suicide prevention training program. *Professional Psychology: Research and Practice*, *50*(6). https://doi.org/10.1037/pro0000261

Cramer, R. J., Ireland, J. L., Long, M. M., Hartley, V., & Lamis, D. A. (2020). Initial validation of the suicide competency assessment form among behavioral health staff in the national health services trust. *Archives of Suicide Research: Official Journal of the International Academy for Suicide Research*, *24*(sup2), S136–S149. https://doi.org/10.1080/13811118.2019.1577194

Cukrowicz, K. C., Duberstein, P. R., Vannoy, S. D., Lin, E. H., & Unützer, J. (2014). What factors determine disclosure of suicide ideation in adults 60 and older to a treatment provider?. *Suicide & Life-threatening Behavior*, *44*(3), 331–337. https://doi.org/10.1111/sltb.12075

Deci, E. L., & Ryan, R. M. (2000). *Handbook of self-determination research.* Rochester, NY: University of Rochester Press.

Deska, J. C., Kunstman, J. W., Smith, A. R., Witte, T. K., & Rancourt, D. (2020). Clinicians'

mental representations of psychopathology are more positive and complex than the lay public but also stigmatize suicide. *Professional Psychology: Research and Practice, 51*(5), 425–434. https://doi.org/10.1037/pro0000358

Dexter-Mazza, E. T., & Freeman, K. A. (2003). Graduate training and the treatment of suicidal clients: The students' perspective. *Suicide and Life-Threatening Behavior, 33*(2), 211–218. https://doi.org/10.1521/suli.33.2.211.22769

Elston, N., Rogers, J. L., Gilbride, D. D., & Shannonhouse, L. R. (2019). Counselors in training identifying and responding to suicidal clients: a matched-control study. *Journal of Counselor Leadership and Advocacy*, *7*(1), 1–14, https://doi.org/10.1080/2326716X.2019.1677532

Emul, M., Uzunoglu, Z., Sevinç, H., Güzel, C., Yilmaz, C., Erkut, D., & Arikan, K. (2011). The attitudes of preclinical and clinical Turkish medical students toward suicide attempters. *Crisis: The Journal of Crisis Intervention and Suicide Prevention, 32*, 128–133. http://dx.doi.org/10.1027/0227-5910/a000065

Enders, C. K. (2010). *Applied missing data analysis.* Guildford Press.

Evans, R. E., & Price, S. (2013). Exploring organizational influences on the implementation of gatekeeper training: A qualitative study of the Applied Suicide Intervention Skills Training (ASIST) program in Wales. *Critical Public Health, 23*(2), 213–224. https://doi.org/10.1080/09581596.2012.752069

Feingold, A. (2009). Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods, 14,* 43. https://doi.org/10.1037/a0014699

Feingold, A. (2015). Confidence interval estimation for standardized effect sizes in multilevel

and latent growth modeling. *Journal of Consulting and Clinical Psychology, 83*, 157. https://doi.org/10.1037/a0037721

Fernández-García, M. P., Vallejo-Seco, G., Livácic-Rojas, P., & Tuero-Herrero, E. (2018). The (ir)responsibility of (under)estimating missing data. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.00556

Franklin, J. C., Ribeiro, J. D., Fox, K. R., Bentley, K. H., Kleiman, E. M., Huang, X., Musacchio, K. M., Jaroszewski, A. C., Chang, B. P., & Nock, M. K. (2017). Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin, 143*(2), 187–232. https://doi.org/10.1037/bul0000084

Frey, L. M., Hans, J. D., & Cerel, J. (2015). Suicide disclosure in suicide attempt survivors: Does family reaction moderate or mediate disclosure's effect on depression? *Suicide and Life-Threatening Behavior, 46,* 96–105. http://doi.org/10.1111/sltb.12175

Gomer, B., & Yuan, K.-H. (2023). A realistic evaluation of methods for handling missing data when there is a mixture of MCAR, MAR, and MNAR mechanisms in the same dataset. *Multivariate Behavioral Research*, *58*(5), 988–1013. https://doi.org/10.1080/00273171.2022.2158776

Gould, M.S., Cross, W., Pisani, A.R., Munfakh, J.L., & Kleinman, M. (2013). Impact of applied suicide intervention skills training (ASIST) on national suicide prevention lifeline counselor interventions and suicidal caller outcomes. *Suicide and Life-Threatening Behavior, 43*(6), 676-691. https://doi.org/10.1111/sltb.12049

Graham, R. D., Rudd, M. D., & Bryan, C. J. (2011). Primary care providers' views regarding assessing and treating suicidal patients. *Suicide and Life-Threatening Behavior*, *41*(6), 614–623. https://doi.org/10.1111/j.1943-278x.2011.00058.x

Griesbach, D., Dolev, R., Russell, P., & Lardner, C. (2008). *The use and impact of applied suicide intervention skills Training (ASIST) in Scotland: An evaluation.* http://webarchive.nrscotland.gov.uk/3000/www.gov.scot/Publications/2008/05/19160035/1

Grund, S., Robitzsch, A., & Luedtke, O. (2023). Mitml: Tools for multiple imputation in multilevel modeling. https://CRAN.R-project.org/package=mitml

Gryglewicz, K., Chen, J. I., Romero, G. D., Karver, M. S., & Witmeier, M. (2017). Online suicide risk assessment and management training: Pilot evidence for acceptability and training effects. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *38*(3), 186–194. https://doi.org/10.1027/0227-5910/a000421

Gryglewicz, K., Monahan, M. M., Chen, J. I., Bozzay, M., Bender, A., Gleason, L. L., Witmeier, M., & Karver, M. S. (2020). Examining the effects of role play practice in enhancing clinical skills to assess and manage suicide risk. *Journal of mental health (Abingdon, England)*, *29*(5), 549–557. https://doi.org/10.1080/09638237.2018.1521936

Guzmán, E. M., Cha, C. B., Ribeiro, J. D., & Franklin, J. C. (2019). Suicide risk around the world: A meta-analysis of longitudinal studies. *Social Psychiatry and Psychiatric Epidemiology*. https://doi.org/10.1007/s00127-019-01759-x

Hager, N. M., Cramer, R. J., Kaniuka, A. R., Vandecar-Burdin, T., Badger, N., Holley, A. M., Foss, J., Glenn, C. R., Judd, S., South, G., & Judah, M. R. (2021). An evaluation of the core competency suicide prevention training program for university health service providers. *Journal of College Student Psychotherapy*. https://doi.org/10.1080/87568225.2021.1911726

Hardt, J., Herke, M. & Leonhart, R. (2012). Auxiliary variables in multiple imputation in regression with missing X: a warning against including too many in small sample research.

BMC Medical Research Methodology, 12, 184. https://doi.org/10.1186/1471-2288-12-184

Hendrix, T. (2023). *Counselors' spirituality, attitudes toward suicide, and self-efficacy in conducting suicide risk assessment* (Publication No. 30632792). [Doctoral dissertation, University of Denver]. ProQuest Information & Learning.

Holmes, G., Clacy, A., Hermens, D. F., & Lagopoulos, J. (2021). The long-term efficacy of suicide prevention gatekeeper training: A systematic review. *Archives of Suicide Research, 25*(2), 177–207. https://doi.org/10.1080/13811118.2019.1690608

IBM Corp. (2023). IBM SPSS Statistics for Macintosh, Version 29. Armonk, NY: IBM Corp

Indelicato, N. A., Mirsu-Paun, A., & Griffin, W. D. (2011). Outcomes of a suicide prevention gatekeeper training on a university campus. *Journal of College Student Development, 52*(3), 350–361. https://doi.org/10.1353/csd.2011.0036

Jobes, D. A. (2006). *Managing suicidal risk: A collaborative approach.* Guilford Press.

Jobes, D. A., Au, J. S., & Siegelman, A. (2015). Psychological approaches to suicide treatment and prevention. *Current Treatment Options in Psychiatry, 2*, 363–370. https://doi.org/10.1007/s40501-015-0064-3

Joiner, T. (2005). *Why people die by suicide*. Harvard University Press.

Kleespies, P. M., Penk, W. E., & Forsyth, J. P. (1993). The stress of patient suicidal behavior during clinical training: Incidence, impact, and recovery. *Professional Psychology: Research and Practice, 24*(3), 293. https://doi.org/10.1037/0735-7028.24.3.293

Kodaka, M., Poštuvan, V., Inagaki, M., & Yamada, M. (2011). A systematic review of scales that measure attitudes toward suicide. *International Journal of Social Psychiatry, 57*(4), 338–361. https://doi.org/10.1177/0020764009357399

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest package: Tests in

linear mixed effects models. *Journal of Statistical Software, 82*(13), 1–26. https://doi.org/10.18637/jss.v082.i13

Lang, W. A., Ramsay, R. F., Tanney, B. L., & Kinzel, T. (2007). *ASIST trainer's manual*. Alberta, CA: LivingWorks.

Large, M., Corderoy, A., & McHugh, C. (2020). Is suicidal behaviour a stronger predictor of later suicide than suicidal ideation? A systematic review and meta-analysis. *Australian and New Zealand Journal of Psychiatry, 55*(3), 254–267. https://doi.org/10.1177/0004867420931161

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Press.

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83,* 1198–1202.

LivingWorks. (2013). *ASIST applied suicide intervention skills training: Evidence in support of the ASIST 11 program,* 2–14. https://www.livingworks.net/resources-and-support/research-and-evaluation/

Lund, E. M., Schultz, J. C., & Nadorff, M. R. (2016). The factor structure, internal consistency, and convergent validity of two suicide assessment competency measures in vocational rehabilitation counselors. *Rehabilitation Counseling Bulletin, 61(*1), 20–27. https://doi.org10.1177/0034355216660840

McAuliffe, N., & Perry, L. (2007). Making it safer: A health centre's strategy for suicide prevention. Psychiatric Quarterly, 78, 295–307.

McNiel, D. E., Fordwood, S. R., Weaver, C. M., Chamberlain, J. R., Hall, S. E., & Binder, R. L. (2008). Effects of training on suicide risk assessment. *Psychiatric Services*, *59*(12), 1462–

1465. https://doi.org/10.1176/appi.ps.59.12.1462

Mackelprang, J. L., Karle, J., Reihl, K. M., & Cash, R. E. (2014). Suicide intervention skills: Graduate training and exposure to suicide among psychology trainees. *Training and Education in Professional Psychology*, *8*(2), 136–142. https://doi.org/10.1037/tep0000050

Matsumoto, M. & Nishimura, T. (1998). Mersenne twister: a 623-dimensionally equidistributed uniform pseudo-random number generator. *ACM Transactions on Modeling and Computer Simulation*, *8*(1), 3–30. https://doi.org/10.1145/272991.272995

Mazza, G. L., Enders, C. K., & Ruehlman, L. S. (2015). Addressing item-level missing data: A comparison of proration and full information maximum likelihood estimation. *Multivariate Behavioral Research*, *50*(5), 504–519. https://doi.org/10.1080/00273171.2015.1068157

Miller, J. K. (2010). Competency-based training: Objective structured clinical exercises (OSCE) in marriage and family therapy. *Journal of Marriage and Family Therapy, 36*, 320–332.

Mitchell, S. L., Kader, M., Darrow, S. A., Haggerty, M. Z., & Keating, N. L. (2013). Evaluating question, persuade, refer (QPR) suicide prevention training in a college setting. *Journal of College Student Psychotherapy, 27*(2), 138–148. https://doi.org/10.1080/87568225.2013.766109

Mok, K., Chen, N., Torok, M., McGillivray, L., Zbukvic, I., & Shand, F. (2020). Factors associated with help-seeking for emotional or mental health problems in community members at risk of suicide. *Advances in Mental Health, Advance Online Publication*. https://doi.org/10.1080/18387357.2020.1770109

Monahan, M. F., & Karver, M. S. (2021). Are they ready yet?: A theory-driven evaluation of suicide risk assessment trainings in psychology graduate programs. *Journal of Clinical Psychology, 77*(7), 1614–1628. https://doi.org/10.1002/jclp.23171

Mueller, A. S., Abrutyn, S., Pescosolido, B., & Diefendorf, S. (2021). The social roots of suicide: Theorizing how the external social world matters to suicide and suicide prevention. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.621569

National Research Council. (2010). *The prevention and treatment of missing data in clinical trials. Panel on handling missing data in clinical trials.* Washington, DC.

Neimeyer, R. A., & Bonnelle, K. (1997). The suicide intervention response inventory: A revision and validation. *Death Studies, 21*(1), 59–81. https://doi.org/10.1080/074811897202137

Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*(4), 372–411. https://doi.org/10.1177/1094428114548590

O'Brien, K. H. M., Fuxman, S., Humm, L., Tirone, N., Pires, W. J., Cole, A., & Goldstein Grumet, J. (2019). Suicide risk assessment training using an online virtual patient simulation. *mHealth, 5*, 31. https://doi.org/10.21037/mhealth.2019.08.03

Organizational Research Services. (2002). *Youth suicide prevention program: Annual evaluation report 2001–2002. Evaluation of program training workshops.* https://www.suicideinfo.ca/resource/siecno-20090489

Pasco, S., Wallack, C., Sartin, R. M., & Dayton, R. (2012). The impact of experiential exercises on communication and relational skills in a suicide prevention gatekeeper-training program for college resident advisors. *Journal of American College Health, 60,* 134–140. https://doi.org/0.1080/ 07448481.2011.623489

Patel, S., Batterham, P. J., Calear, A. L., & Cryer, R. (2016). Predictors of comfort and confidence among medical students in providing care to patients at risk of suicide. *Academic Psychiatry, 40*(6), 919–922. https://doi.org/10.1007/s40596-016-0583-2

Pisani, A. R., Cross, W. F., & Gould, M. S. (2011). The assessment and management of suicide

risk: state of workshop education. *Suicide & Life-Threatening Behavior, 41*(3), 255–276. https://doi.org/10.1111/j.1943-278X.2011.00026.x

QPR Institute. (1995). *Practical and proven suicide prevention training.* QPR Institute. https://qprinstitute.com/

Quené, H., & Van den Bergh, H. (2004). On multi-level modeling of data from repeated measures designs: A tutorial. *Speech Communication*, *43*(1-2), 103–121. https://doi.org/10.1016/j.specom.2004.02.004

Quinnett, P. (2010). *Suicide risk assessment competency certification examination*. QPR Institute. https://qprinstitute.com

R Core Team. (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org

Rimkevičienė, J., Skruibis, P., & Padroštytė, G. (2020). Effectiveness of applied suicide intervention skills training (ASIST) in Lithuania. *Death Studies*. https://doi.org/10.1080/07481187.2020.1867254

Robillard, C. L., Dixon-Gordon, K. L., & Turner, B. J. (2022). Teaching dialectical thinking to enhance graduate trainees' competence in outpatient psychotherapy for adolescents experiencing suicidal thoughts and behaviors. *Canadian Psychology / Psychologie Canadienne, 63*(3), 392–404. https://doi.org/10.1037/cap0000297

Rodgers, P. (2010). *Review of the applied suicide intervention skills training program (ASIST): Rationale, evaluation skills, and direction for future research.* LivingWorks Education, Inc. https://www.livingworks.net/dmsdocument/274.

Rodgers, W. M., Markland, D., Selzer, A-M, Murray, T. C., & Wilson, P. M. (2014). Distinguishing perceived competence and self-efficacy: An example from physical

exercise. *Research Quarterly for Exercise and Sport, 85*, 527–539. https://doi.org/10.1080/02701367.2014.961050

Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting and Clinical Psychology, 21*, 95–103.

Rothes, I., & Henriques, M. (2018). Health professionals facing suicidal patients: What are their clinical practices?. *International Journal of Environmental Research and Public Health*, *15*(6), 1210. https://doi.org/10.3390/ijerph15061210

Rubin, D. B. (1987). Multiple imputation for survey nonresponse. New York: Wiley & Sons.

Sareen, J., Isaak, C., Bolton, S. L., Enns, M. W., Elias, B., Deane, F., Munro, G., Stein, M. B., Chateau, D., Gould, M., & Katz, L. Y. (2013). Gatekeeper training for suicide prevention in First Nations community members: A randomized controlled trial. *Depression and Anxiety*, *30*(10), 1021–1029. https://doi.org/10.1002/da.22141

Scheerder, G., Reynders, A., Andriessen, K., & Van Audenhove, C. (2010). Suicide intervention skills and related factors in community and health professionals. *Suicide and Life-Threatening Behavior, 40,* 115–124. https://doi.org/10.1521/suli.2010.40.2.115

Schmitz, W. M., Allen, M. H., Feldman, B. N., Gutin, N. J., Jahn, D. R., Kleespies, P. M., ... & Simpson, S. (2012). Preventing suicide through improved training in suicide risk assessment and care: An American Association of Suicidology Task Force report addressing serious gaps in US mental health training. *Suicide and Life-Threatening Behavior*, *42*(3), 292–304. https://doi.org/10.1111/j.1943-278X.2012.00090.x

Shah, A. D., Bartlett, J. W., Carpenter, J., Nicholas, O., & Hemingway, H. (2014). Comparison of random forest and parametric imputation models for imputing missing data using MICE: a CALIBER study. *American Journal of Epidemiology*, *179*(6), 764–774.

https://doi.org/10.1093/aje/kwt312

Shannonhouse, L., Lin, Y.-W. D., Shaw, K., & Porter, M. (2017). Suicide intervention training for K–12 schools: A quasi-experimental study on ASIST. *Journal of Counseling & Development*, *95*(1), 3–13.

Shannonhouse, L., Lin, Y.-W. D., Shaw, K., Wanna, R., & Porter, M. (2017). Suicide intervention training for college staff: Program evaluation and intervention skill measurement. *Journal of American College Health*, *65*(7), 450–456.

Shannonhouse, L. R., Elston, N., Lin, Y.-W. D., Mize, M. C., Rumsey, A., Rice, R., Wanna, R. and Porter, M. J. (2018). Suicide intervention training for counselor trainees: A quasi-experimental study on skill retention. *Counselor Education and Supervision, 57*, 194–210.

Shannonhouse, L., Rumsey, A. D., Elston, N., Mize, M. C., Hightower, J., & Lin, Y.-W. D. (2019). Analysis of a standardized suicide intervention training for counselor trainees. *Teaching and Supervision in Counseling, 1*(2).

Silva, C., Smith, A. R., Dodd, D. R., Covington, D. W., & Joiner, T. E. (2016). Suicide-related knowledge and confidence among behavioral health care staff in seven states. *Psychiatric Services*, *67*(11), 1240–1245. https://doi.org/10.1176/appi.ps.201500271

Smith, A. R., Silva, C., Covington, D. W., & Joiner, T. E., Jr. (2014). An assessment of suicide-related knowledge and skills among health professionals. *Health Psychology*, *33*(2), 110–119. https://doi.org/10.1037/a0031062

Snijders, T. A., & Bosker, R. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. SAGE Publications.

Suicide Prevention Resource Center. (2006). *Core competencies in the assessment and management of suicidality.* Newton, MA.

Suicide Prevention Resource Center. (2010). *QPRT suicide risk assessment and management training*. Suicide Prevention Resource Center. https://www.sprc.org/resources-programs/qprt-suicide-risk-assessment-and-management-training

Tierney, R. J. (1994). Suicide intervention training evaluation: A preliminary report. *Crisis*, *15*(2), 69–76.

Trimble, L., Jackson, K., & Harvey, D. (2000). Client suicidal behavior: Impact, interventions, and implications for psychologists. *Australian Psychologist, 35*(3), 227-232.

Turley, B., Pullen, L., Thomas, A., & Rolfe, A. (2000). *LivingWorks applied suicide intervention skills training (ASIST): A competency-based evaluation*. Melbourne, Australia: LivingWorks.

van Buuren, S. (2007). Multiple imputation of discrete and continuous data by fully conditional specification. *Statistical Methods in Medical Research*, *16*(3), 219–42.

van Buuren, S. & Groothuis-Oudshoorn, K. (2011). Mice: Multivariate imputation by chained equations in R. *Journal of Statistical Software, 45*(3), 1–67.

van Buuren, S. (2018). *Flexible imputation of missing data*. Boca Raton, FL: Chapman & Hall/CRC.

Wright, A. J. (2022). Master's-level psychological assessment competencies and training. *Training and Education in Professional Psychology*, *16*(3), 272–279.

Yip, P. S. F., Zheng, Y., & Wong, C. (2022). Demographic and epidemiological decomposition analysis of global changes in suicide rates and numbers over the period 1990–2019. *Injury Prevention, 28,* 117–124.

Zhang, S., Han, P., & Wu, C. (2019). A unified empirical likelihood approach for testing MCAR and subsequent estimation. *Scandinavian Journal of Statistics*, *46*(1), 272–288.

Table 1

Sample Demographic Characteristics and Clinical Training Background by Group

	Frequency (%)				
Variables	Total	Experimental	Control	*p*	Effect Size
Sex assigned at birth				.038*	0.29
Female	46 (82.1%)	15 (68.2%)	31 (91.2%)		
Male	10 (17.9%)	7 (31.8%)	3 (8.8%)		
Gender identity				.125	0.26
Female	44 (78.6%)	15 (68.2%)	29 (85.3%)		
Male	11 (19.6%)	7 (31.8%)	4 (11.8%)		
Other (unspecified)	1 (1.8%)	0 (0.0%)	1 (2.9%)		
Race				.345	0.30
American Indian or Alaskan Native	1 (1.8%)	0 (0.0%)	1 (2.9%)		
Asian	2 (3.6%)	2 (9.1%)	0 (0.0%)		
Black or African American	3 (5.4%)	2 (9.1%)	1 (2.9%)		
White	47 (83.9%)	17 (77.3%)	30 (88.2%)		
Multiracial	3 (5.4%)	1 (4.5%)	2 (5.9%)		
Ethnicity				.460	0.12
Hispanic	8 (14.3%)	2 (9.1%)	6 (17.6%)		
Non-Hispanic	48 (85.7%)	20 (90.9%)	28 (82.4%)		
Sexual orientation				.460	0.26
Heterosexual or straight	43 (76.8%)	18 (81.8%)	25 (73.5%)		
Gay or lesbian	1 (1.8%)	0 (0.0%)	1 (2.9%)		

Variables	Frequency (%)			*p*	Effect Size
	Total	Experimental	Control		
Bisexual	9 (16.1%)	3 (13.6%)	6 (17.6%)		
Questioning	1 (1.8%)	1 (4.5%)	0 (0.0%)		
Other (e.g., queer, pansexual)	2 (3.6%)	0 (0.0%)	2 (5.9%)		
Religious identity				<.001*	0.65
Protestant	6 (10.7%)	1 (4.5%)	5 (14.7%)		
Roman Catholic	3 (5.4%)	2 (9.1%)	1 (2.9%)		
Jewish	16 (28.6%)	12 (54.6%)	4 (11.8%)		
Muslim	1 (1.8%)	1 (4.5%)	0 (0.0%)		
Atheist, Agnostic, or Nothing in particular	22 (39.3%)	6 (10.8%)	16 (47.0%)		
Other (e.g., Methodist, Non-denominational Christian)	8 (14.3%)	0 (0.0%)	8 (14.3%)		
Master's degree				.130	0.22
Yes	8 (14.3%)	1 (4.5%)	7 (20.6%)		
No	48 (85.7%)	21 (95.5%)	27 (79.4%)		
Experience providing mental health services for suicidal clients				.248	0.19
Yes	19 (33.9%)	5 (22.7%)	14 (41.2%)		
No	37 (66.1%)	17 (77.3%)	20 (58.8%)		

Note. Effect size represents Cramer's V. * $p < .05$.

Table 2

Pooled Bivariate Correlations and GVIF Among Time-Invariant Predictor Variables

Variables	Group	Sex assigned at birth	Cultural sanctions	Accrued clinical hours	Number of clients at risk for suicide	GVIF
Group	–					1.089
Sex assigned at birth	.293*	–				1.061
Cultural sanctions	-.347*	-.084	–			1.074
Accrued clinical hours	-.379*	.018	.181*	–		1.202
Number of clients at risk for suicide	-.185*	-.061	.158*	.276*	–	1.319
Number of clients with suicidal ideation	-.148	-.020	.102	.239*	.599*	1.299

Note. GVIF = generalized variance inflation factor. * $p < .05$

Table 3

Pooled Means and Standard Deviations for Outcome Measures at Each Time Point by Group

	Control			Experimental		
	Pre-training	Post-training	3-month Follow-up	Pre-training	Post-training	3-month Follow-up
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
SCI Total	45.71 (5.69)	47.68 (4.99)	48.25 (4.71)	39.73 (5.64)	46.47 (5.28)	44.97 (4.56)
SCI WT	17.53 (2.16)	17.65 (2.31)	18.04 (1.82)	14.91 (3.02)	16.95 (2.81)	16.50 (2.07)
SCI PC	6.32 (1.85)	7.02 (1.50)	7.31 (1.36)	4.77 (1.27)	7.53 (1.15)	7.30 (1.45)
SCI WA	21.85 (3.26)	23.00 (2.29)	22.90 (3.06)	20.05 (3.27)	21.99 (2.90)	21.17 (3.40)
SCAF Total	23.61 (4.83)	25.61 (4.13)	26.95 (4.57)	18.00 (3.73)	27.32 (3.50)	27.29 (2.43)
SCAF Global	4.21 (1.14)	4.33 (0.86)	4.51 (1.03)	2.75 (0.96)	5.14 (1.02)	4.90 (0.95)
SIRI-2	43.07 (13.22)	40.57 (12.89)	41.24 (11.55)	49.84 (15.52)	46.73 (19.48)	48.60 (18.41)
SIRI-2-Under	23.42 (9.76)	24.23 (9.93)	26.71 (9.66)	26.12 (9.55)	28.44 (11.29)	33.80 (11.48)
SIRI-2-Over	19.66 (10.94)	16.34 (10.64)	14.54 (8.96)	23.72 (15.57)	18.30 (19.24)	14.80 (15.25)
SBAQ FSP	15.35 (10.58)	16.95 (10.80)	14.84 (8.26)	23.15 (12.32)	20.44 (13.29)	17.99 (6.75)
SBAQ PCR	56.04 (17.26)	61.27 (16.33)	64.90 (16.16)	35.33 (17.59)	62.00 (14.99)	61.73 (14.06)
SBAQ RS	32.12 (13.33)	33.26 (13.41)	31.68 (12.73)	42.81 (13.37)	40.77 (13.67)	42.78 (16.13)

Note. SCI = Suicide Competency Inventory; WT = Willingness to Treat ; PC = Perceived Competence; WA = Willingness to Assess SCAF = Suicide Competency Assessment Form; SIRI-2 = Suicide Intervention Response Inventory – Revised; SBAQ = Suicide Behavior Attitude Questionnaire; FSP = Feelings toward Suicidal Patient; PCR = Professional Capacity; RS = Right to Suicide

Table 4

Pooled Multilevel Model Test Parameters for Pre- to Post-training Changes

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SCI	Time	2.19	0.82	2.66	105.77	.009*	0.84
	Group	-4.77	1.71	-2.78	50.10	.008*	-0.79
	Time:Group	3.22	1.30	2.47	108.23	.015*	1.28
SCI WT	Time	0.36	0.56	0.64	106.51	.525	0.07
	Group	-2.03	0.85	-2.39	50.02	.021*	-0.68
	Time:Group	1.10	0.89	1.23	108.48	.220	0.76
SCI PC	Time	0.70	0.30	2.35	85.88	.021	0.73
	Group	-1.46	0.45	-3.22	50.02	.002*	-0.73
	Time:Group	1.89	0.46	4.11	101.75	<.001*	1.35
SCI WA	Time	1.13	0.43	2.64	104.90	.010*	0.83
	Group	-1.28	0.93	-1.38	50.05	.174	-0.40
	Time:Group	0.23	0.68	0.34	107.94	.735	0.36
SCAF Total	Time	1.64	0.77	2.13	101.69	.036*	0.73
	Group	-5.07	1.28	-3.97	50.05	<.000*	-0.95

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SCAF Total	Time:Group	7.31	1.22	6.01	106.91	<.000*	1.68
SCAF Global	Time	0.12	0.22	0.56	83.94	.580	0.16
	Group	-1.53	0.29	-5.18	48.25	<.001*	-1.10
	Time:Group	2.28	0.35	6.49	78.78	<.001*	1.91
SIRI-2-Trad	Time	-2.68	1.69	-1.58	97.69	.118	-0.42
	Group	7.11	4.35	1.64	49.84	.108	0.43
	Time:Group	-0.30	2.65	-0.11	105.67	.910	-0.06
SIRI-2-Under	Time	0.65	1.33	0.49	83.99	.625	0.18
	Group	4.19	3.06	1.37	49.51	.178	0.36
	Time:Group	1.81	2.04	0.88	101.06	.378	0.21
SIRI-2-Over	Time	-3.33	1.57	-2.12	101.04	.037*	-0.59
	Group	2.93	4.08	0.72	49.90	.477	0.18
	Time:Group	-2.11	2.47	-0.85	106.71	.396	-0.23
SBAQ FSP	Time	1.59	2.08	0.77	106.89	.445	0.21
	Group	6.71	3.45	1.95	50.09	.057	0.43
	Time:Group	-4.31	3.31	-1.30	108.62	.195	-0.36

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SBAQ PCR	Time	5.23	2.47	2.12	107.41	.037*	0.58
	Group	-18.31	4.88	-3.75	50.06	<.001*	-0.89
	Time:Group	21.44	3.94	5.44	108.80	<.001*	1.48
SBAQ RS	Time	1.15	1.76	0.65	107.44	.517	0.18
	Group	6.35	3.84	1.65	49.87	.104	0.40
	Time:Group	-3.18	2.81	-1.13	108.82	.260	-0.31

Note. Time = main effect of time; Group = main effect of group; Time:Group = an interaction effect between time and group. * $p < .05$

Table 5

Pooled Multilevel Model Test Parameters for Pre-training to 3-month Follow-up Changes.

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SCI	Time	2.77	0.88	3.14	100.35	.002*	0.87
	Group	-5.05	1.73	-2.92	46.40	.005*	-0.83
	Time:Group	2.28	1.41	1.63	101.60	.107	0.58
SCI WT	Time	0.62	0.50	1.25	101.33	.215	0.34
	Group	-1.98	0.79	-2.52	46.19	.015*	-0.76
	Time:Group	0.78	0.79	0.98	103.57	.327	0.45
SCI PC	Time	0.98	0.32	3.09	85.51	.003*	0.89
	Group	-1.56	0.48	-3.26	46.57	.002*	-0.73
	Time:Group	1.54	0.50	3.09	95.60	.003*	0.87
SCI WA	Time	1.16	0.52	2.23	103.05	.028*	0.56
	Group	-1.52	1.09	-1.40	46.30	.169	-0.40
	Time:Group	-0.04	0.84	-0.04	101.81	.966	0.03
SCAF Total	Time	3.45	0.73	4.73	105.01	<.001*	1.28
	Group	-5.76	1.33	-4.33	46.54	<.001*	-1.06

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SCAF Total	Time:Group	5.84	1.18	4.94	99.99	<.001*	1.43
SCAF Global	Time	0.30	0.23	1.33	77.97	.188	0.39
	Group	-1.47	0.33	-4.47	44.38	<.001*	-1.01
	Time:Group	1.86	0.35	5.31	95.83	<.001*	1.50
SIRI-2-Trad	Time	-1.86	1.45	-1.28	95.07	.205	-0.36
	Group	6.61	4.73	1.40	46.49	.169	0.40
	Time:Group	0.66	2.36	0.28	87.61	.781	0.07
SIRI-2-Under	Time	2.82	1.24	2.28	94.61	.025*	0.77
	Group	3.03	3.41	0.89	45.95	.379	0.25
	Time:Group	4.90	1.95	2.51	100.94	.014*	0.65
SIRI-2-Over	Time	-4.68	1.50	-3.13	102.10	.002*	-0.91
	Group	3.58	4.11	0.87	46.71	.388	0.24
	Time:Group	-4.24	2.38	-1.78	104.38	.077	-0.42
SBAQ FSP	Time	-0.51	1.74	-0.29	107.50	.769	-0.08
	Group	6.96	3.08	2.26	46.46	.029*	0.53
	Time:Group	-4.65	2.78	-1.67	108.48	.097	-0.46

Variable	Type of Effect	β	*SE*	*t*	*df*	*p*	Cohen's *d*
SBAQ PCR	Time	8.86	2.56	3.46	107.88	.001*	0.94
	Group	-18.92	5.20	-3.64	46.90	.001*	-0.89
	Time:Group	17.54	4.10	4.28	108.58	<.001*	1.17
SBAQ RS	Time	-0.43	2.13	-0.20	106.57	.839	-0.06
	Group	9.51	4.25	2.23	46.67	.030*	0.55
	Time:Group	0.41	3.38	0.12	108.21	.905	0.03

Note. Time = main effect of time; Group = main effect of group; Time:Group = an interaction effect between time and group. * $p < .05$

Appendix A

Demographics Measure.

Participant ID (please double check you enter the correct ID, which can be found in an email from the research team):	
1. Age (in years):	
2. What is your biological sex (i.e., assigned sex at birth)?	a) Female b) Male c) Intersex
3. What is your current gender identity?	a) Female b) Male c) Trans female / trans woman d) Trans male / trans man e) Genderqueer / gender-nonconforming f) Self-identify (please type out):
4. Please identify your race.	a) American Indian or Alaskan Native b) Asian c) Black or African American d) Native Hawaiian or Other Pacific Islander e) White f) Multiracial g) Other racial identity (please type out):
5. Please identify your ethnicity.	a) Hispanic or Latino b) Not Hispanic or Latino
6. Please identify your sexual orientation.	a) Heterosexual/straight b) Gay/lesbian c) Bisexual d) Questioning e) Other (please type out):

7. What is your present religion, if any?	a) Protestant b) Episcopalian c) Roman Catholic d) Mormon e) Orthodox Christian f) Jewish g) Jewish Orthodox h) Muslim	i) Muslim Orthodox j) Buddhist k) Hindu l) Hindu Orthodox m) Atheist n) Agnostic o) Nothing in particular p) Other (please type out):
8. How important is religion/spirituality to you?		1 = Not important at all 2 = Not important 3 = Important 4 = Very important
9. Do you have a master's degree in clinical psychology or another mental-health discipline (e.g., mental health counseling, marriage and family therapy, or social work)?		a) No b) Yes (please type out):
10. Do you have any prior experience with providing mental health services for suicidal clients?		a) No b) Yes
11. (if yes to Q10) How many suicidal clients did you interact with? Please provide your best estimate by typing in a number:		
12. (if yes to Q10) How many hours did you spend interacting with suicidal clients? Please provide your best estimate by typing in a number:		
13. In what setting(s) did you interact with suicidal clients? Select all that apply.		a) Crisis hotline counseling b) Outpatient mental health clinic c) Inpatient psychiatric unit d) Partial hospital e) Residential treatment f) Other (please type out):

Appendix B

Suicide Competency Inventory (SCI; Lund et al., 2016)

Choose the response that best applies to you.				
1	2	3	4	5
Strongly disagree	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**
1. I am comfortable with the responsibility of treating suicidal patients.				
2. I feel competent to treat a patient in an acute suicidal crisis.				
3. I would be willing to treat a depressed patient who had made a suicide attempt in the past.				
4. I would be willing to treat a depressed patient who had reported a suicide attempt over five years in the past.				
5. I would be willing to treat a depressed patient with suicidal thoughts.				
6. I would be willing to treat a depressed patient who made a suicide attempt in the past year.				
7. I would be more hesitant to ask about suicidality in a patient who is 20 years older than me.				
8. I might refrain from asking a patient about suicide due to fear of offending the patient.				
9. I worry that bringing up suicide with a patient might make the problem worse.				
10. I would be more hesitant to ask a male patient about suicide.				
11. I would be more hesitant to ask about suicidal tendencies in a patient who was of higher social status or rank than me.				

Appendix C

Suicide Competency Assessment Form (SCAF; Cramer et al., 2013)

Using the scale provided, please rate yourself on each of the following competencies.			
1	2	3	4
Incapability to perform the task *(not been trained or unable to do this task)*	**Approaching or partial competency** *(partially trained or educated on this task)*	**Competency** *(adequate training and skill in this task)*	**Advanced competency** *(exceptional skill on the most current techniques for this task)*
1. Know and manage your attitude and reactions toward suicide.			
2. Maintain a collaborative, empathetic stance toward the client.			
3. Know and elicit evidence-based risk and protective factors.			
4. Focus on current plan and intent of suicidal ideation.			
5. Determine the level of risk.			
6. Develop and enact a collaborative, evidence-based treatment plan.			
7. Notify and involve other persons.			
8. Document risk, plan, and reasoning for clinical decisions.			
9. Know the law concerning suicide.			
10. Engage in debriefing and self-care.			

Using the scale provided, please rate your overall suicide assessment competency.							
1	2	3	4	5	6	7	8
Unacceptable *(not been trained or unable to do this task)*		**Working toward competence** *(partially trained or educated on this task)*		**Competent** *(adequate training and skill in this task)*		**Advanced** *(exceptional skill on the most current techniques for this task)*	

Appendix D

Suicide Intervention Response Inventory – Revised (SIRI-2; Neimeyer & Bonnelle, 1997)

The following items represent a series of excerpts from counseling sessions. Each excerpt begins with an expression by the client concerning some aspect of the situation they face, followed by possible helper responses to the client's remark.

You are to rate each response in terms of how appropriate or inappropriate you feel the reply is to the client's comment. In the blank, you should record a rating from –3 to +3 corresponding to the chart below. Please be sure to respond to each item and try not to leave any blanks.

+3	Highly appropriate response
+2	Appropriate response
+1	Marginally appropriate response
0	Neither appropriate, nor inappropriate
-1	Marginally inappropriate response
-2	Inappropriate response
-3	Highly inappropriate response

1. **Person at-risk:** I decided to call in tonight because I really feel like I might do something to myself... I've been thinking about suicide.	
	Helper A: You say you're suicidal, but what is it that's really bothering you?
	Helper B: Can you tell me more about your suicidal feelings?
2. **Person at-risk:** And now my health is going downhill too on top of all the rest. Without my husband around to care for me anymore, it just seems like the end of the world.	
	Helper A: Try not to worry so much about it. Everything will be alright.
	Helper B: You must feel pretty lonely and afraid of what might happen.
3. **Person at-risk:** But my thoughts have been so terrible… I could never tell them to anybody.	

	Helper A: You can tell me. I'm a professional and have been trained to be objective about these things.
	Helper B: Some of your ideas seem so frightening to you that you imagine other people would be shocked to know you are thinking such things.
4. **Person at-risk:** No one can understand the kind of pain I've been through. Sometimes I just feel like I have to hurt myself, so I cut my wrists.	
	Helper A: It seems like you've been suffering so much that cutting your wrists is the only way you can make the pain go away.
	Helper B: But you're so young, you have so much to live for. How can you think of killing yourself?
5. **Person at-risk:** What are you anyway? Are you a doctor? How do you know what I've been going through? You've probably had it pretty soft.	
	Helper A: So, you're wondering if I can understand how you feel.
	Helper B: You're not even giving me a chance. I've had a pretty rough life, too; you're not the only one who's seen some hard time.
6. **Person at-risk:** My life has been worthless ever since my wife, Emma, died four years ago. The kids are grown and married now, and I've been retired from my job at the railroad for some time. It just seems that I'd be better off dead.	
	Helper A: But try to think of what Emma would want for you. She'd want you to continue leading a productive life, wouldn't she?
	Helper B: It sounds like everything just collapsed around you when Emma died. But what has happened recently to make things even worse, to make you think that dying is the only way out?
7. **Person at-risk:** I really need help… it's just… [voice breaks: silence]	
	Helper A: It must be hard for you to talk about what's bothering you.
	Helper B: Go on. I'm here to listen to you talk.
8. **Person at-risk:** When you sum up my problem like that, it makes it seem less confusing and not so scary.	
	Helper A: See, it really isn't so bad after all. It certainly isn't anything you would think of killing yourself over, is it?

	Helper B: Sometimes talking about problems does make them a bit clearer. I think you realize how dangerous your suicidal feelings were; that's why you decided to contact me.
9. **Person at-risk:** You were supposed to help me, but you've only made things worse.	
	Helper A: I'm sorry. I was only trying to help.
	Helper B: You sound pretty angry.
10. **Person at-risk:** How could you ever help me? Have you ever wanted to kill yourself?	
	Helper A: It sounds like you're concerned about whether I can understand and help you.
	Helper B: Sure. I've thought about suicide sometimes. But I always found more realistic solutions to my problems.
11. **Person at-risk:** I don't know… this whole thing with my wife really gets to me. [Sobs] I try so hard to keep from crying…	
	Helper A: Do you think that the reason it's hard for you to cry is because you're a man?
	Helper B: With all the hurt you're feeling, it must be impossible to hold those tears in.
12. **Person at-risk:** How can I believe in God anymore? No God would ever let this happen to me; I've never done anything to deserve what's happened.	
	Helper A: Things have gotten so bad that it's difficult to see any meaning in the things that have happened to you.
	Helper B: Well, God works in mysterious ways. Maybe this is His way of testing your faith.
13. **Person at-risk:** I don't know why I'm calling you. My family is financially well off, and my husband spends plenty of time with me even though he has a successful law career. Even my kids have been doing well. They get good marks at school and have lots of free time activities with their friends, but nothing seems to interest me. Life is just a bore…	
	Helper A: Consider all you have going for you; your problems can't be all that serious. Try to focus more on the positive aspects of your situation.
	Helper B: So even though things seem to be going well at one level, life still seems pretty depressing, even if it's hard to say exactly why.

15. **Person at-risk:** Is it really true that many people feel this way? I thought I was the only one who had such dreadful, sinful ideas.	
	Helper A: No, there are many people who suffer from mental illness. But with appropriate treatment by a qualified physician, some of these patients can be cured.
	Helper B: It is true. You're not the only one who has suicidal thoughts. And you can be helped to get through this crisis, just as others have been.
16. **Person at-risk:** I'm so lonely, so tired. [crying] There just isn't anywhere left to turn.	
	Helper A: You seem so alone, so miserable. Have you been feeling suicidal?
	Helper B: Come on now. Things can't be all that bad.
17. **Person at-risk:** [over telephone] It's hard to talk here with all these people.	
	Helper A: Would it help if I asked questions?
	Helper B: Why don't you call back some other time when you can talk more easily?
18. **Person at-risk:** I have a gun pointed at my head right now, and if you don't help me, I'm going to pull the trigger.	
	Helper A: You seem to be somewhat upset.
	Helper B: I want you to put down the gun so we can talk.
19. **Person at-risk:** Why should you care about me, anyway?	
	Helper A: I've been trained to care about people. That's my job.
	Helper B: Because I think your death would be a terrible waste, and it concerns me that things are so that you are considering suicide. You need help to get through this critical period.
20. **Person at-risk:** I really hate my father. He's never shown any love for me, just complete disregard.	
	Helper A: You must be really angry at him for not being there when you need him.
	Helper B: You shouldn't feel that way. After all, he is your father, and he deserves some respect.

21. **Person at-risk:** I don't think there's really anyone who cares whether I'm alive or dead.	
	Helper A: It sounds like you're feeling pretty isolated.
	Helper B: Why do you think that no one cares about you anymore?
22. **Person at-risk:** I tried going to a therapist once before, but it didn't help… nothing I do now will change anything.	
	Helper A: You've got to look on the bright side. There must be something you can do to make things better, isn't there?
	Helper B: Okay, so you're feeling hopeless, like even a therapist couldn't help you. But has anyone else been helpful before—maybe a friend, relative, teacher, or clergyman?
23. **Person at-risk:** My psychiatrist tells me I have an anxiety neurosis. Do you think that's what's wrong with me?	
	Helper A: I'd like to know what this means to you in this present situation. How do you feel about the problem?
	Helper B: I'm not sure I agree with that diagnosis. Maybe you should seek out some psychological testing just to be certain.
24. **Person at-risk:** I can't talk to anybody about my situation. Everyone is against me.	
	Helper A: That isn't true. There are probably lots of people who care about you if you'd only give them a chance.
	Helper B: It must be difficult to find help when it's so hard to trust people.
25. **Person at-risk:** [voice is slurred, unclear over telephone]	
	Helper A: You sound so tired. Why don't you get some sleep and call back in the morning?
	Helper B: Your voice sounds so sleepy. Have you taken anything?

Appendix E.

Suicide Behavior Attitude Questionnaire (SBAQ; Botega et al., 2005; 2007).

For each item, please select a point on the line above that best reflects your opinion, feeling, or reaction. The far most left of the line (i.e., "0") indicates "strongly disagree," and the far most right of the line (i.e., "100") indicates "strongly agree."
_____ **0** **100**
1. Honestly, I prefer not to get involved with patients who attempted suicide.
2. One feels impotent toward a person who wants to kill themself.
3. Who gives a forewarning usually does not kill oneself.
4. I sometimes get angry because there are so many people who want to live, and that patient wants to die.
5. The person who really wants to commit suicide does not try to.
6. I am afraid of asking about ideas of suicide for fear of inducing it.
7. In the case of patients who are suffering a lot due to disease, I think that the idea of suicide is more acceptable.
8. I feel capable of helping a person who attempted suicide.
9. I have professional skills to handle patients at risk of suicide.
10. I feel I am capable of perceiving when a patient is at risk of suicide.
11. I feel insecure to care for patients at suicide risk.
12. Life is God's gift, therefore only He can take it back.
13. Despite everything, I think that if a person wants to kill themself, they have the right to.
14. When a person talks about committing suicide, I try to change their mind.
15. When facing a suicide, I think: if somebody had talked to the person, they would have found another way.
16. The person who has God in their heart will not commit suicide.

Appendix F

Clinical Experiences Questionnaire (CEQ; adapted from Elston et al., 2019)

Thinking back over the last three months:	
1. Have you completed any additional training for suicide risk assessment or intervention?	a) Yes b) No
2. (if yes to Q1) how many hours of such training have you received:	
3. (if yes to Q1) In which format was the training you received? Select all that apply.	a) A lecture/workshop b) An online training module c) Discussion of actual cases with supervisors d) Suicide prevention-related coursework e) Role-plays/simulations f) Other (please explain):
4. (if yes to Q1) Please indicate what the training you received covered. Select all that apply.	a) Warning signs for suicide b) Risk and protective factors for suicide c) Suicide risk assessment d) Safety plan e) Lethal means counseling f) Other (please explain):
5. Which theoretical orientation did you follow in your clinical work? Select all that apply.	a) Cognitive behavioral therapy (CBT) b) Psychodynamic therapy c) Dialectical behavioral therapy (DBT) d) Humanistic therapy e) Family systems f) Other:
6. How many clinical hours have you accrued this year so far?	
7. How many clients did you see for therapy, intake, or assessment, in total?	
8. How many of your clients appeared at risk of suicide?	
9. How many of your clients said they were thinking of killing themselves, ending their life, or dying by suicide?	
10. How many of your clients engaged in self-harm?	

11. How many of your clients attempted suicide?	
12. (if the sum of responses to Q8 to Q11 is greater than zero) Please indicate how often you did the following with those clients at risk (as reported on Q8 to Q11):	
1 2 3 4 5 6 7 **Never** **Always**	
	a) Asked clients to elaborate on specific actions, feelings, or words used during the session, and/or specifically asked about physical appearance that appeared to be warning signs.
	b) Used closed and open-ended questions to directly ask about suicide.
	c) Used a reflection of feeling or meaning to help my client feel completely heard and understood.
	d) Assisted my client to help them identify sources of support and hope in their life.
	e) Helped my client develop a safety plan.
	f) Asked my client to repeat the safety plan and any actions associated with the plan to assess their commitment to the plan.
13. How effective do you think the interventions you implemented were for those clients at risk?	
1 2 3 4 5 6 7 **Not effective at all** **Very effective**	

Appendix G

Cultural Assessment of Risk for Suicide, Cultural Sanctions Subscale (CARS; Chu et al., 2013)

Choose the response that best applies to you.					
1	2	3	4	5	6
Strongly disagree	**Moderately disagree**	**Slightly disagree**	**Slightly agree**	**Moderately agree**	**Strongly agree**
1. Suicide would bring shame to my family.					
2. My family, culture, or religious beliefs about suicide prevent me from considering killing myself.					
3. My family, culture, or religion is against the idea of suicide.					
4. I consider suicide to be morally wrong.					

Appendix H

Missing Data Analyses and Multiple Imputation

Rationales for Missing Data Technique Selection

Missing data analyses including Little's MCAR test supported that data were likely missing completely at random, or MCAR. Under MCAR, complete-case analysis using pairwise deletion produces unbiased estimates (Gomer & Yuan, 2023). However, pairwise deletion can still produce inaccurate standard errors (Newman, 2014). Additionally, there can be a loss of power with pairwise deletion relative to more sophisticated missing data techniques such as multiple imputation or the full information maximum likelihood (FIML) method (Buhi et al., 2008). Given the modest sample size in the present study, multiple imputation was used to ensure sufficient power.

Multiple Imputation

Multiple imputation (MI) involves generating complete versions of data with each version having missing values imputed using random selections from distributions created from the observed or existing data (Shah et al., 2014). In other words, multiple informed hypotheses are made of what the missing values in the data would have been based on data that are observed and available. Per the National Research Council (2010), research and statistics experts agree that MI is considered one of two most recommended procedures for treating ignorable missing data (e.g., MCAR) (Fernández-García et al., 2018). Furthermore, in contrast to pairwise deletion, MI is both unbiased and able to produce accurate standard errors when data are MCAR (Newman, 2014).

Imputation of data relies on the use of a stochastic algorithm to estimate values based on information from the observed or existing values and generates unique values in each imputed

dataset (Hardt et al., 2012). With MI, it is expected to observe additional variance from the differences in the unique imputed values across each copy of the dataset—this is referred to as the relative increase of variance (RIV) and can be calculated to capture the degree of uncertainty for the overall imputation process (Rubin, 1987). While it is feasible to perform MI at both the item- and scale-level (e.g.., imputing composite scores for study measures compared to imputing individual item scores and then calculating composite scores with imputed values), Mazza et al. (2015) found that addressing missing data at the item-level drastically increases statistical power relative to handling missing data at the scale-level. Thus, MI was performed at the item-level in the current study.

MI was performed using SPSS version 29 (IBM Corp, 2023). Random numbers were generated using the Mersenne Twister (Matsumoto & Nishimura, 1998), and the workflow seed was set at a fixed value of 2000000 to allow for replication. Ten multiply imputed datasets were created based on general guidelines that creating at least five imputed datasets is appropriate with moderate degrees of missing data (van Buuren, 2018). All study measures with missing data (i.e., CARS, SCI, SCAF, SIRI2, SBAQ, and CEQ) were imputed at the item-level under fully conditional specification (Markov Chain Monte Carlo method) with a maximum number of ten iterations. The fully conditional specification method is suitable for arbitrary patterns of missing data and generates imputations for multivariate data on an individual variable-by-variable basis (van Buuren, 2007). Two-way interactions were included among categorical predictors, though such interactions did not provide meaningful data for interpretation. Linear regression was used as the model type for continuous and scale variables rather than predictive mean matching.

In terms of imputation constraints, each item was assigned a minimum and maximum possible imputed value based on the range of their respective Likert scales. The exceptions to

this rule were the CEQ variables such as item 6 on the CEQ (i.e., assessing for number of clinical hours). For these variables with no clear maximum constraint, only a minimum constraint of zero was set to avoid the linear regression model allowing for negative numbers of clinical hours. The resulting multiply imputed datasets were visually inspected (e.g., using multiple line charts to assess for convergence), and imputed values were within the plausible range. Composite and subscale scores were calculated for measures in each multiply imputed dataset. Parameters of interest were calculated for each multiply imputed dataset and combined using Rubin's (1987) rules for pooling multiply imputed data estimates.