

Impact of Applied Suicide Intervention Skills Training (ASIST) on National Suicide Prevention Lifeline Counselor
Interventions and Suicidal Caller Outcomes

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ABSTRACT

We examined the impact of the implementation of Applied Suicide Intervention Skills Training (ASIST) across the National Suicide Prevention Lifeline's national network of crisis hotlines. Data was derived from 1,507 monitored calls from 1,410 suicidal individuals to 17 Lifeline centers in 2008-2009.

Callers were significantly more likely to feel less depressed, less suicidal, less overwhelmed, and more hopeful by the end of calls handled by ASIST-trained counselors. Few significant changes in ASIST-trained counselors' interventions emerged; however, improvements in callers' outcomes were linked to ASIST-related counselor interventions, including exploring reasons for living and informal support contacts. ASIST training did not yield more comprehensive suicide risk assessments.

Suicide is recognized as a public health problem with nearly one million deaths by suicide world- wide, and approximately 39,000 deaths in the U.S. per year (World Health Organization, 2012; McIntosh & Drapeau, 2012). To address this global tragedy, public health interventions with widespread capacity to reach at-risk populations are needed (Knox & Caines, 2004). Since their inception in the 1950s and 1960s, telephone crisis services have become integral to national suicide prevention strategies and mental healthcare systems (Covington, Hogan, Abreu, Berman, & Breux, 2011; King, Nurcombe, Bickman, Hides, & Reid, 2003; Bobevski & Holgate, 1997). The National Suicide Prevention Lifeline (Lifeline) (www.suicidepreventionlifeline.org) - the national network of over 150 community crisis centers in the United States - features prominently in a range of national suicide prevention programs. To highlight its scope and import, Lifeline served its 3 millionth caller in October, 2011, with over 800,000 callers in 2012 alone. The Department of Veterans Affairs operates a national suicide prevention hotline for veterans and active military members using the Lifeline telephone number, 1-800-273-TALK (www1.va.gov/opa/pressrel/pressrelease.cfm?id=1363). Moreover, Lifeline is referenced in public awareness messaging campaigns and in federal-, community- and advocacy-level information and referral documents and websites, including the Army's suicide prevention website (www.armyg1.army.mil/HR/suicide/default.asp).

A major goal of Lifeline centers is to reduce callers' current crises and/or suicidal states and to enhance the long-term safety of callers. The accomplishment of these goals is likely to be a function of the risk assessments and interventions provided by crisis counselors; therefore, Lifeline has focused attention on the standardization of crisis counselors' practices and training across the network (<http://www.suicidepreventionlifeline.org>). Evaluation is necessary to determine whether this training is effective, and whether telephone crisis interventions are achieving their goals. Several recent studies have examined callers' proximal outcomes and/or counselors' behaviors on crisis lines in Australia, Canada, the U.K., and the U.S. Coveney, Pollack, Armstrong, & Moore (2012) employed online anonymous surveys of callers to the Samaritans helpline in the U.K. to assess satisfaction with the service, and self-reported efficacy of contact.

Surveys (n=1,309) indicated that respondents felt the contact had an immediate positive effect, and left them feeling less suicidal, alone, afraid, and anxious and more hopeful, supported and wanting to live. However, despite Samaritans policy requiring volunteers to ask about suicidal feelings at every contact, only 59% of respondents reported being asked about suicide. Mishara and Daigle (1997) listened to 617 telephone calls from suicidal callers to two Canadian suicide centers. Immediate or proximal effects on the reduction of depressive mood and suicidal urgency were linked to a specific intervention approach, characterized by a non-judgmental, empathetic style, which incorporated limited directive components. King et al. (2003) rated 100 taped suicide calls to Kids Help Line in Australia. Significant decreases in suicidality and significant improvements in the mental state of youth were observed during the course of the call. Mishara et al. (2007a; 2007b) monitored 2,611 calls to 14 crisis lines in the U.S., observing counselor behaviors, caller characteristics, and changes during the calls. Among the authors' conclusions were that centers varied greatly in the nature and quality of the telephone help they provided; empathy and respect were desired counselor qualities; and a supportive approach, good contact and collaborative problem solving were intervention styles that related to better call outcomes. Nonetheless, while callers appeared to be helped in a significant numbers of calls and some lives may have been saved, counselors did not consistently evaluate suicide risk, and when risk evaluations were conducted they were usually incomplete. Another assessment of proximal outcomes was conducted with callers expressing suicidal (n=1085) and nonsuicidal crises (n=1617) during calls to eight crisis hotlines across the U.S. (Kalafat, Gould, Munfakh, & Kleinman, 2007; Gould, Kalafat, Munfakh, & Kleinman, 2007). The study employed callers' own ratings of their mental state and suicidality, in response to a standardized set of inquiries by the crisis counselors at the beginning and end of the call, to assess the immediate proximal effect of the crisis intervention. A follow-up assessment was conducted two to four weeks later to assess the duration of the effect. A key finding was that there were significant reductions in callers' self-reported crisis and suicide states from the beginning to the end of the calls; however, without a control group, these effects cannot be definitively attributed to the crisis intervention. Other notable positive findings

were that seriously suicidal individuals were calling telephone crisis services (for example, over half of suicidal callers had made a prior suicide attempt and had a plan when they called), and 11.6% of suicidal callers reported at follow up that the call prevented them from harming or killing themselves. A troubling finding was that of the callers who were rated as non-suicidal crisis callers by crisis staff, 12% reported at follow up that they were feeling suicidal either during or since their calls to the center. This latter result, which was consistent with the finding reported by Coveney and her colleagues (2012) and Mishara and his colleagues (2007a; 2007b), raised concern about the adequacy of suicide risk assessments conducted by some crisis center staff.

In light of this concern, Lifeline began disseminating the LivingWorks' Applied Suicide Intervention Skills Training (ASIST; LivingWorks, 2010), an internationally disseminated gatekeeper training program designed as "suicide first-aid," across its network of centers several years ago. ASIST trainers and Lifeline training personnel collaborated on the ASIST adaptation for this context. The ASIST program has been field-tested in a variety of settings where pre-post differences in trainees' attitudes and knowledge have been reported (Guttormsen, Hoifodt, Silvola, & Burkeland, 2003; Mellanby et al., 2010; Pearce, Rickwood, & Beaton, 2003; Silvola, Hoifodt, Guttormsen, & Burkeland, 2003; Turley, Pullen, Thomas, & Rolfe, 2000). Changes in behavior on the part of either trainees or at-risk individuals receiving the intervention have seldom been examined, a limitation of most gatekeeper training program evaluations (see Isaac, Elis, Katz, Belik, & Deane, 2009 for review). In one evaluation of a university-based suicide intervention program employing ASIST (Pearce et al., 2003) noted changes in trainees' attitudes and knowledge were not correlated with corresponding changes in behavior. To date, there has been no controlled study of ASIST's effectiveness in general or in the specific context of crisis hotlines. Given the key roles of Lifeline and ASIST in national suicide prevention efforts, it is essential to know whether the ASIST training has furthered Lifeline's goals of increasing the adequacy of crisis center counselors' suicide risk assessments and interventions, and decreasing callers' crisis and suicide states. The present study is the first national randomized controlled trial conducted of a crisis center intervention and training strategy. The main question addressed by the study is whether the ASIST

program increased the effectiveness of Lifeline's telephone crisis services. Increased effectiveness should be evidenced by an improvement in the quality of crisis counselors' interventions and a parallel improvement in outcomes of callers. The present study will provide unique information about the effectiveness of an internationally-implemented standardized training in suicide prevention.

METHODS

Sample

Crisis Centers. Seventeen (17) centers participated in the evaluation. Eighteen (18) centers were originally selected, but one center dropped out after their ASIST training because it encountered financial problems and no longer had enough telephone counselors to answer Lifeline calls during the evaluation period. The centers were selected on the basis of organizational stability (in operation at least five years), sufficient call volume (at least 25 network calls per month, to ensure feasibility of silent monitoring data collection procedures), quality assurance processes (at least one supervisor available on site or on-call for each shift), a willingness to adopt agreed upon standardization of call record keeping and evaluation procedures, and ASIST training status (not ASIST trained prior to the commencement of the study). Although not a random sample of all centers in the Lifeline network, the recruited centers provided a sound "window" into the population of Lifeline network centers by virtue of their diversity in size, location, and operating procedures.

Calls. A total of 1,507 calls from 1,410 suicidal individuals to the Lifeline were monitored. We used only the first call from the 97 callers who accessed the telephone line twice or three times. Calls were classified as coming from a suicidal caller if the caller acknowledged current thoughts of suicide (including thoughts the day before or earlier in the day of the call), current plans to kill themselves, or actions they had taken to kill themselves right before calling the crisis hotline. Monitoring occurred seven days per week during the 6pm to midnight (centers' local times) shifts at each center, with the exception of two West Coast centers, which had their calls monitored from 8:30pm- 12:30am and 7pm to midnight because this time period had the highest call volume. The following types of ineligible calls (N=3,826) were categorized and noted on the monitoring

coding form, but were not completely abstracted: information and referral calls, third party calls, obscene or prank calls, calls from non-English speaking callers, calls from people who lacked cognitive capacity or had communication problems, calls from minors, and calls from individuals whose frequency of calls to a particular center necessitated the implementation of a special protocol by the center staff. The centers gave us a list of telephone numbers of these individuals who called frequently, and if we monitored more than three calls from the same individual we considered the calls to be ineligible by virtue of their frequency. An additional 1,270 calls from 1,160 callers experiencing non-suicidal crises were monitored, but are not the focus of the present paper.

Procedures

Design. The research protocol was timed to coincide with Lifeline's roll out of ASIST version X.2 across its network of telephone crisis centers in 2008 and 2009. Lifeline conducted ASIST "training for trainers" (T4T) sessions in January and July of each of these two years. Two staff members from each center participated in the T4T training. These two trained staff members, in turn, provided the standard 2-day ASIST training to other crisis counselors upon their return to the centers. The research design randomized 18 centers to three training sessions (N= 6 centers per training) in the first two years of the grant, employing a dynamic wait-listed or "roll-out" design for randomized trials (Brown et al., 2005). A dynamic wait-listed design has advantages over a traditional wait-listed design, where a randomly selected half of the units receives an intervention in the early portion of the study, and the other half receives the intervention later. The dynamic design has been shown to yield greater statistical power than traditional designs and to be more "robust" in the presence of exogenous factors (Brown, Wyman, Guo, & Pena, 2006). Another valuable feature of the dynamic wait-listed design is the standardization of procedures across all centers, regardless of training status, over the two-year data collection period. In other words, all centers were assessed in the same fashion, blind to training status, at the same time.

Our data was collected over the course of 19 months (June, 2008 through December, 2009) across three training cohorts. The first cohort (4 centers) of counselors trained had the longest post-training assessment period (18 months), the second cohort (6 centers) had the next longest post-training assessment period (12 months), and the third cohort (7 centers) had the shortest post-training assessment period (6 months). As previously noted, one center (from the first cohort) dropped out after their ASIST training because it encountered financial problems. Another modification in the design was a change in one center's training date from the first to the last cohort.

ASIST Intervention. Although not under the aegis of the research project, the clinical training that ASIST-trained and wait-listed counselors will be described. The ASIST Suicide Intervention Model (SIM) has three phases of caregiving: connecting, understanding and assisting. During the "Connecting" phase the counselor's task is to explore the caller's "invitations" (e.g., presenting problems, stressful life events, feelings such as anger, loneliness, sadness etc.). Counselors are instructed to explore the meaning of such events to a caller and any connection they may have to suicidal thoughts. The "Understanding" phase focuses on callers' reasons for dying and for living and the counselor's task is to "listen to/ listen for" these reasons. Counselors are instructed to spend sufficient time listening to an at-risk person's reasons for dying with the assumption that doing so can help uncover potential reasons for living. The last phase of SIM is "Assisting." The counselor's task in this phase is to establish a "Safeplan" that specifically addresses each element of risk identified in the previous phases of the intervention. The ASIST training package does not include a structured tool to assess elements of risk (including psychosis, suicidal/homicidal ideation and intent) but provides didactic and active learning exercises (including simulations) to model the behaviors needed to successfully perform the tasks of SIM's three phases.

Wait-listed Group. The Lifeline has recommended best practices that it expects the crisis centers in the network to adhere to (<http://www.networkresourcecenter.org/Practice%20Guidelines/Pages/QualityImprovement.asp>). Each of the

centers in the network develops its own training procedures to enhance its counselors' ability to adhere to these best practices. Counselors are trained to establish good contact with callers; work collaboratively with callers on their presenting problems; assess for suicide risk; assist callers assessed to be at imminent risk of suicide; and provide resources and referrals to callers. Thus, all Lifeline counselors, including the non-ASIST trained counselors (i.e., the wait-listed group), routinely receive training in the assessment and management of suicidal callers. As part of this routine training, Lifeline counselors are trained to ask directly about suicidal ideation and then probe about intent, plans or means if the caller reveals thoughts about suicide, as well as explore the caller's spontaneous reports of suicidal ideation, plans and means. Although training goals are consistent across the network, the format in which this training is delivered varies center by center.

Silent monitoring of calls. A remote "real-time" monitoring system was developed by Lifeline on our behalf. Silent monitors, who were trained crisis counselors, but not affiliated with the centers in the evaluation project, accessed the calls off-site via the Internet. Monitors were blind to the center that was handling the monitored call, as well as to the ASIST-training status of the counselor being monitored. Monitors were not trained in ASIST. The same monitors rated calls from ASIST-trained and non-ASIST-trained counselors, and they assessed changes in counselors' and callers' behaviors in the same way for both groups. In the rare case when the monitor heard what was judged to be a clear and imminent threat of harm to the caller (or to someone with whom the caller had contact) that did not appear to have been responded to by the center counselor, the project director would be notified immediately and the center's supervisor would be contacted to apprise him/her of the situation and inquire if an emergency response such as a call trace or rescue protocol had been implemented. The silent monitors were randomly "double-monitored" by the project director for quality control purposes. To assess the inter-rater reliability of the silent monitored data, 35 and 33 calls from each of two monitors were double rated by the project director.

Measures

The silent monitoring form was a structured coding tool that included an assessment of (1) *Global Counselor Behaviors*. Counselor behaviors during the calls were rated on a 4-point scale using an adaptation from Mishara et al., (2007a; 2007b). Positive counselor behaviors included allowing the caller to talk about his/her feelings/situation, reflecting back the caller's feelings, reflecting back the caller's situation, connecting/establishing rapport with the caller, empowering the caller, being sensitive/receptive to caller's problems, and showing empathy/validating caller. Negative counselor behaviors included challenging the caller in a negative way, being condescending, disempowering the caller, engaging in inappropriate behavior (i.e., falling asleep, laughing at caller), being judgmental, preaching or forcing opinions on caller, being rude. Total positive and total negative scale scores were constructed by adding up the individual items. The scale scores could range from 0 to 24 and 0 to 21 for the positive and negative scales, respectively. The Cronbach's alpha of the total positive scale and negative scale was 0.90 and 0.78, respectively. An overall assessment of the counselor's effectiveness in handling the call was rated on a 5 point scale, ranging from very ineffective to very effective. The duration of the call (in minutes) was also recorded. (2) *ASIST Suicide Intervention Model (SIM) Counselor Behaviors*. With the consultation of the LivingWorks' developers we operationalized which counselor interventions would reflect each of the three SIM components - connecting, understanding and assisting. The number of invitations revealed by callers was considered an indication of the success of the connection between counselor and caller. Collaboratively reviewing current risk status (including suicidal thoughts and behaviors), identifying reasons for dying, reasons for living, and exploring the caller's ambivalence about dying were considered components of understanding the needs and risk of the caller. Indications of successfully assisting the caller were: disabling a suicide plan (e.g., removing access to lethal means), linking callers to interpersonal resources, linking callers to mental health/health services, and identifying emergency contacts. (3) *Caller Behavioral Changes*. The caller behavioral changes assessed during the course of the call were feeling less agitated, less alone, less depressed, less overwhelmed, less suicidal,

more confident and in control, and more hopeful. The monitors rated the changes in the callers based on the caller's affect and statements during the call. Ratings were based on direct observation, and did not take into account the effect of counselor behavior in eliciting affect or statements. The inter-rater reliability of the counselor interventions and caller behavioral outcomes used in the analyses are presented in Table 1. All reliability estimates were in the good to excellent range (Landis & Koch, 1977).

The project's protocol was approved by the Institutional Review Boards of the New York State Psychiatric Institute/Columbia University.

Statistical Analysis

We employed multilevel modeling (i.e., mixed-effect regression analyses) to account for the hierarchical structure of our data (calls/callers nested within crisis centers). The software package, Supermix (2009), available from Scientific Software International was used. Supermix (2009) can fit models with both our dichotomous and continuous variables with nested data. The independent variables entered into each regression analysis were training status (with or without ASIST training) as a random effect, and the time period of the training session (July 2008, January 2009, or July 2009) as a fixed effect. All statistical tests were 2-sided. P values of less than .05 were considered to be statistically significant. The inter-rater reliability of the counselor behaviors and caller outcomes was assessed using intra-class correlation coefficients (for continuous scales) and kappa (for dichotomous items), employing SPSS, version 18 (PASW, 2009).

RESULTS

Crisis counselors' interventions.

Counselors' global behaviors, as well as their specific interventions consistent with the ASIST Suicide Intervention Model (SIM) components of connecting, understanding, and assisting, are presented as a function of ASIST training status in Table 2. Of the 23 counselor behaviors (four "global counselor behaviors" and 19 SIM counselor behaviors) we assessed, six were significantly enhanced by the ASIST training. The ASIST training yielded significantly longer calls and an increased number of "invitations" (i.e., signs of suicide risk)

revealed by callers. Counselors who had received the ASIST training were significantly more likely than non-ASIST-trained counselors to try to link the callers' invitations to suicidal thoughts, explore reasons for living and ambivalence about dying, and explore informal support contacts as part of the callers' safe plans. However, the ASIST-trained counselors were not significantly more likely to ask about or explore the callers' current suicide plans, preparatory behaviors/actions, intent, or prior suicide thoughts or attempts. Moreover, ASIST-trained counselors were not more likely to be rated as engaging in more positive behaviors overall, or have their interventions rated as more effective by the silent monitors.

Callers' behavioral changes.

Caller behavioral changes during the call as a function of counselors' ASIST training status are presented in Table 3. Four of the seven caller behavioral changes that were assessed were significantly associated with the counselors' ASIST training. Suicidal callers whose counselors had been ASIST-trained were significantly more likely than callers whose counselors had not been ASIST-trained to be rated by the silent monitors as becoming less depressed, less overwhelmed, less suicidal, , and more hopeful during the course of the call. The odds ratios ranged from 1.31 (less depressed) to 1.74 (less suicidal). Thus, if callers spoke with ASIST-trained counselors rather than non-ASIST-trained counselors, the odds that callers would be less depressed was increased by 31% and the odds that callers would be less suicidal was increased by 74%.

Effects of training over time

The time of the ASIST training (July 2008, January 2009, or July 2009) was not a significant independent variable in any of the regression analyses examining the impact of ASIST on counselors' behaviors or callers' outcomes. As such, the effectiveness of the ASIST training was not a function of the number of months since the training.

Relationship between Counselor Interventions and Caller Behavioral Changes

Post hoc analyses were conducted to examine the relationships between the subsets of counselor interventions and caller behavioral changes significantly impacted by ASIST (see Table 4). Overall, each of the

counselor interventions that the ASIST training appeared to impact was significantly associated with positive caller behavioral changes. The strongest associations with the caller behavioral changes were found for the counselor interventions involving exploring the callers' reasons for living (e.g., $OR_{\text{less suicidal}}=2.05$), ambivalence about dying (e.g., $OR_{\text{less suicidal}}=1.89$) and informal support contacts (e.g., $OR_{\text{less suicidal}}=2.31$). The weakest associations with the caller behavioral changes were found for the length of the call and the number of invitations revealed by callers. The odds ratio for the relationship between the length of the call and the caller behavioral change of "less suicidal" was 1.04, meaning that for every one minute that the call was lengthened, the odds that callers were less suicidal was increased by 4%. Thus, the three minute longer average call for the ASIST- trained group would be estimated to yield a 12% increase in the odds that callers would be less suicidal. The number of invitations revealed by callers was associated with an odds ratio of 1.14 for the caller behavioral outcome "less suicidal." This means that for every one extra invitation that was revealed during the call (e.g., from 7.2 to 8.4), the odds that callers was less suicidal at the end of the call was increased by 14%.

DISCUSSION

The present study is the first national randomized controlled trial conducted of a crisis center intervention and training strategy. We monitored 1,507 calls from 1,410 suicidal individuals to 17 Lifeline network centers to assess whether standardized training in the ASIST model yielded significant changes in counselors' behaviors and callers' outcomes. Based on silent monitoring by observers blind to counselors' ASIST-training status, callers who spoke with ASIST-trained counselors appeared less depressed, suicidal, and overwhelmed, and there was greater improvement in callers' feeling hopeful than among callers who spoke with a counselor in the wait-listed condition. The potential magnitude of the impact of the ASIST training on reducing callers' suicidal risk is underscored when we apply the study's findings to the 800,000 individuals who call the Lifeline each year. Approximately 25% (200,000) of these callers are suicidal (as estimated from our total silent monitoring dataset of Lifeline calls). The ASIST training of Lifeline counselors could yield

approximately 29,000 *more* callers who would be moderately to a lot *less* suicidal at the end of their crisis call (59.9% minus 45.3% (as estimated from Table 3) multiplied by 200,000).

Changes exhibited by callers to ASIST-trained crisis centers appeared to be related to some meaningful counselor behavioral changes that also emerged after the ASIST training. Longer calls and increased likelihood of the callers revealing “invitations” (i.e., signs of suicide risk) suggest that trained counselors were more successful at establishing a connection with callers. The association between the length of the call and improvements in caller outcomes is consistent with Fukkink's (2011) finding that the quality of online one-on-one chat services was correlated with the length of the chat. Furthermore, the trained counselors' increased focus on callers' reasons for living and ambivalence about dying may have had the effect of reviving hope, and thereby may be responsible for decreasing callers' suicidal feelings. Reasons for living and the tension between these and reasons for dying have been identified as key measures of suicide risk (Jobes & Mann, 1999; Linehan, Goodstein, Nielsen, & Chiles, 1983). The association we found between exploration of reasons for living and improved caller outcomes is consistent with the rationale behind cognitive therapy interventions for preventing suicide attempts, in which patients are trained to call to mind their reasons for living as a strategy for increasing hopefulness in times of stress (Brown et al., 2006; Stanley et al, 2009). Reasons for living have been found to be inversely correlated with combined scores on hopelessness, depression and suicidal ideation (Malone et al. 2000). Lastly, ASIST-trained counselors increased attention to callers' informal support contacts may help to mitigate callers' sense of isolation, while at the same time accommodating many callers' reluctance to engage with formal mental healthcare (Gould, Munfakh, Kleinman, & Lake, 2012). In keeping with this reluctance, informal care has been identified as meeting a “key proportion of healthcare need in all societies” (Pitman & Osborn, 2011, p.8).

Despite these positive findings, most of the counselor interventions that were assessed did not differ between ASIST-trained counselors and counselors in the wait-listed condition. ASIST-trained counselors were not observed to engage in more positive behaviors or fewer negative behaviors, and were no more likely to

explore different dimensions of suicide risk (e.g., asking about/exploring plans, preparatory behaviors, intent, prior attempts). These findings may be explained by the considerable overlap in the content of the Lifeline centers' routine trainings and the ASIST training, particularly with regard to risk assessments. The differences observed in this study were in those behaviors that are specifically and distinctly emphasized in the ASIST model: exploring callers' reasons for living, highlighting ambivalence between living and dying, and having callers identify informal sources of support. Significant differences between ASIST-trained and non-ASIST-trained counselors emerged in those areas, but not in areas that are common to many training programs. One implication of our findings might be that a focus on the specific content areas of reasons for living and informal support contacts contributes to improved caller outcomes independently of a counselor's overall supportive and collaborative style - a potentially important insight for the training and evaluation of telephone crisis counselors and other crisis intervention personnel. Future training efforts also need to focus on inconsistent and/or inadequate assessment of suicide risk, which is a continuing problem highlighted by the current study and other studies examining telephone crisis services (Coveney et al., 2012; Gould et al., 2007; Mishara et al., 2007b; Kalafat et al., 2007). This is a critical issue that needs to be addressed by Lifeline's future efforts to train and supervise counselors. Whether our finding that ASIST training failed to improve counselors' risk assessments reflects a lack of adherence to specific segments of ASIST's content or competence in the delivery of ASIST is currently under investigation (Cross, Pisani, Schmeelk-Cone, Xia, Tu, Munfakh & Gould, unpublished) . These findings may be able to inform future training efforts.

The present study has several advantages for determining whether the ASIST training added value over and above the centers' individual training programs. First, the dynamic wait-listed or "roll-out" design for randomized trials provides a robust method to control for exogenous events that may have occurred during the course of the trial, and to examine the effectiveness of the training as a function of length of time since training (Brown et al., 2006). We did not find the effects of the training to diminish over time. Second, the research was conducted in ecologically valid settings (crisis centers), enabling generalization to the actual

setting of interest. Third, we directly observed counselors' behaviors following the training rather than merely relying on the counselors' self-reports of acquired knowledge, shifted attitudes, or predicted future behaviors. Furthermore, suicidal individuals' outcomes following the counselors' ASIST training were included. Clinicians' skills and suicidal individuals' behaviors are recommended outcomes for the evaluation of training programs that aim to improve the care of suicidal individuals (Pisani, Cross & Gould, 2011).

The study also has important limitations. First, we recruited centers with interest and motivation to participate, rather than a random sample of all Lifeline crisis centers. Nevertheless, the recruited centers were diverse in size, location, and operating procedures, and as such provided an adequate representation of the Lifeline network. Moreover, a random sample of calls within each participating center was monitored. Second, we did not include a rating of the caller's level of hopelessness, depression, and suicide risk at the beginning and end of the call. Thus, comparisons could not be made between callers grouped into higher -or lower-risk categories, and the strength of the ASIST program for various levels of risk could not be explored. Nevertheless, our measures of callers' behavioral changes achieved good inter-rater reliability so that a major aim of the study was achieved. Lastly, we examined short-term effects of the ASIST training on callers' outcomes, reflecting telephone crisis services' emphasis on de-escalating callers' suicidal crises during a call. An examination of longer-term effects on callers of the counselors' ASIST training is needed.

ASIST is widely disseminated as a gatekeeper training program in Australia, Canada, Ireland, Northern Ireland, Norway, Scotland and the United States, and has been delivered to over one million caregivers (<http://www.livingworks.net/page/Research%20and%20Evaluations>). This is the first randomized trial of ASIST. Our findings indicate that gatekeeper training programs such as ASIST can be effectively adapted for implementation over the telephone with individuals who have reached out for help. Further research is necessary to determine whether the patterns of counselor behaviors and caller outcomes found in the present study are similar or different when the intervention is delivered in settings where those receiving ASIST may not have prior experience in the assessment and management of suicide risk, and where the at-risk individuals

may not have sought any help for their problems. However, to the extent that our findings can be generalized to gatekeeper interactions in other settings, we can see promise in callers' increased disclosure of distress and improved outcomes during interactions with ASIST-trained counselors, and reason for concern in ASIST's lack of impact on the thoroughness of counselors' assessment of risk.

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Table 1. Inter-rater reliability of Counselor Interventions and Caller Outcomes

Counselor Interventions	Intraclass Correlation Coefficient or Kappa
Global Counselor Behaviors	
Counselor positive behaviors (total score) ^a	.80
Counselor negative behaviors (total score) ^a	.74
Overall effectiveness of counselor's intervention ^a	.69
ASIST Model "Connecting"	
Invitations revealed by callers (number) ^a	.86
ASIST Model "Understanding"	
Counselor tried to link caller's invitations to suicidal thoughts	.82
Counselor asked/explored caller's:	
Current suicide thoughts ^b	.91
Current plans ^b	.81
Current actions ^b	.83
Current Intent ^b	.80
Prior thoughts ^b	.70
Prior attempts ^b	.96
Reasons for dying ^b	.90
Reasons for living ^b	1.0
Ambivalence	1.0
ASIST Model "Assisting"	
Safe plan offered/explored by counselor:	
Disabling of suicide plan ^b	.82
Managing psychological pain ^b	.73
Past survival skills ^b	1.0
Safe/no use of alcohol/drugs ^b	1.0
Ensuring caller not alone ^b	.44
Informal support contacts ^b	.79
Personal/internal resources ^b	.83
Formal resources ^b	.93

Table 1 continued. Inter-rater reliability of Counselor Behaviors and Caller Outcomes

Caller behavioral changes	Intraclass Correlation Coefficient or Kappa
Caller Felt:	
Less agitated ^a	.78
Less alone ^a	.65
Less depressed ^a	.72
Less overwhelmed ^a	.76
Less suicidal ^{a c}	.83
More confident and in control ^a	.62
More hopeful ^a	.67
	.87
Total score w/ suicide item ^a	
Total score w/o suicide item ^a	.81

^a Intraclass coefficient ^b Kappa ^c Only asked of suicidal callers

Table 2. Impact of ASIST on Counselors' Interventions

	Without ASIST Training (N=646)		With ASIST Training (N=764)	
	Mean	(SD)	Mean	(SD)
Global Counselor Behaviors				
Duration of call (minutes)	24.4	(17.1)	27.1	(18.7)
			B=3.17 (1.05-5.29) p < .01	
Counselor positive behaviors (total score)	17.8	(5.3)	16.9	(4.9)
			B=0.18 (-1.53-1.17) p=.80	
Counselor negative behaviors (total score)	0.4	(1.3)	0.5	(1.5)
			B=0.01 (-0.16 – 0.17)p=.90	
Overall effectiveness of intervention	3.7	(1.0)	3.6	(1.0)
			B=0.02 (-0.17 – +0.21)p=.84	
ASIST Model "Connecting"				
Invitations revealed by callers	7.2	(3.5)	8.4	(3.9)
			B=1.41 (0.97-1.86) p < .0001	

Table 2 continued. Impact of ASIST on Counselors' Interventions

	Without ASIST Training (N=646)		With ASIST Training (N=764)	
	No.	%	No.	%
ASIST Model "Understanding"				
Counselor tried to link caller's invitations to suicidal thoughts	461/643	71.7	621/764	81.3
				OR= 2.10 (1.49-2.95) p<.0001
Counselor asked/explored caller's:				
Current suicide thoughts	604	93.6	703	92.1
				OR=0.92 (0.53-1.58) p=.75
Current plans	394	61.0	448	58.6
				OR= 1.00 (0.68-1.47) p=.99
Current actions	142	22.0	180	23.6
				OR= 1.28 (0.91-1.82) p=.16
Current Intent	259	40.1	300	39.3
				OR= 0.98 (0.76-1.27) p=.87
Prior thoughts	178/526	33.8	223/633	35.2
				OR= 0.99 (0.70-1.41) p=.96
Prior attempts	309	47.8	366	47.9
				OR= 0.87 (0.63-1.18) p=.36
Reasons for dying	377/643	58.6	488/763	64.0
				OR= 1.22 (0.91-1.62) p=.23
Reasons for living	207/645	32.1	271/763	35.5
				OR=1.46 (1.03-2.07) p < .05
Ambivalence	101/645	15.7	174/763	22.8
				OR=1.65 (1.19-2.28) p < .01

Table 2 continued. Impact of ASIST on Counselors' Interventions

	Without ASIST Training (N=646)		With ASIST Training (N=764)	
	No.	%	No.	%
ASIST Model "Assisting"				
Safe plan offered/explored by counselor:				
Disabling of suicide plan	25/259	9.7	41/298	13.8
			OR = 1.48 (0.73-3.01) p=.28	
Managing of psychological pain	268	41.5	350	45.8
			OR =1.25 (0.93-1.68) p=.14	
Past survival skills	113	17.5	134	17.5
			OR = 1.01 (0.65-1.57) p=.97	
Safe/no use of alcohol/drugs	37	5.7	54	7.1
			OR =1.26 (0.74-2.15) p=.40	
Ensuring caller not alone	111	17.2	114	14.9
			OR =0.82 (0.55-1.21) p=.31	
Informal support contacts	250	38.7	344	45.0
			OR =1.50 (1.11-2.04) p< .01	
Personal/internal resources	275	42.6	270	35.3
			OR = 0.85 (0.67-1.09) p=.19	
Formal resources	397	61.5	486	63.6
			OR = 1.20 (0.92-1.56) p=.17	

Table 3. Caller Behavioral Changes During the Call

Caller Felt:	Without ASIST Training (N=638)				With ASIST Training (N=763)			
	Not at all %	A little %	Moderately %	A lot %	Not at all %	A little %	Moderately %	A lot %
Less agitated	14.4	35.0	32.6	18.1	13.5	32.5	35.4	18.6
				OR = 1.26 (.93-1.71) p=.13				
Less alone	14.9	40.6	31.9	12.7	16.9	35.5	34.3	13.4
				OR = 1.08 (.82-1.41) p=.56				
Less depressed	27.1	40.8	24.8	7.3	24.9	36.4	30.4	8.3
				OR = 1.31 (1.01-1.71) p < .05				
Less overwhelmed	22.2	49.7	24.9	12.1	17.9	36.3	31.7	14.1
				OR = 1.46 (1.18-1.82) p < .05				
Less suicidal	16.8	37.9	23.5	21.8	15.8	24.3	32.3	27.6
				OR = 1.74 (1.39-2.18) p < .001				
More confident/in control	29.5	37.5	23.2	9.8	28.2	30.4	30.3	11.1
				OR = 1.29 (0.95-1.75) p=.10				
More hopeful	26.7	38.1	25.9	9.4	24.3	31.0	34.9	9.8
				OR = 1.35 (1.04-1.77) p < .05				
Total score Mean (sd)		9.18 (5.9)				9.95 (5.9)		
				B=1.03 (0.24-1.81) P < .05				

Table 4. Relationship of Counselor Interventions and Caller Behavioral Changes

Caller Behavioral Changes	Counselor Interventions					
	Length of call (in minutes)	# Invitations revealed	Linking invitations to suicidal thoughts	Explored reasons for living	Explored ambivalence about dying	Explored informal support contacts
	OR (95% CI) p	OR (95% CI) p	OR (95% CI) p	OR (95% CI) p	OR (95% CI) p	OR (95% CI) p
Less depressed	1.02 (1.02-1.03) .0001	1.12 (1.09-1.15) .0001	1.22 (0.98-1.54) .08 NS	2.09 (1.56-2.7) .0001	2.22 (1.74-2.84) .0001	1.88 (1.55-2.30) .0001
Less overwhelmed	1.03 (1.02-1.03) .0001	1.13 (1.10-1.16) .0001	1.39 (1.10-1.75) .01	1.84 (1.40-2.42) .0001	1.77 (1.38-2.26) .0001	2.10 (1.64-2.70) .0001
Less suicidal	1.04 (1.03-1.05) .0001	1.14 (1.11-1.17) .0001	1.72 (1.34-2.20) .0001	2.05 (1.58-2.66) .0001	1.89 (1.46-2.43) .0001	2.31 (1.82-2.94) .0001
More hopeful	1.02 (1.02-1.03) .0001	1.11 (1.08-1.13) .0001	1.20 (0.96-1.50) .12 NS	2.05 (1.60-2.63) .0001	2.04 (1.59-2.61) .0001	1.97 (1.47-2.65) .0001