**ORIGINAL PAPER**

# Asking is Caring: Integrating Families into School-Based Suicide Prevention Efforts

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**Abstract**
Youth suicide is a significant public health concern in the USA, ranking as the second leading cause of death for youth and young adults. Schools are increasingly being called upon to be involved in suicide prevention efforts, ideally in partnership with parents and caregivers; however, few school-based suicide prevention interventions incorporate families into their strategies. The current study evaluates the feasibility, acceptability, and short-term outcomes of Asking is Caring (AiC), a mental health promotion and suicide prevention program delivered by families to families in coordination with schools. Results from this initial pilot with 191 parent/caregiver training recipients show that parents serving as AiC trainers have significant credibility and, ratings of the AiC curriculum and collateral materials were high. With respect to short-term outcomes, AiC participants reported improved knowledge, self-efficacy, attitudes, and behaviors related to youth suicide prevention. Changes in self-reported use of empathic listening with youth and maintaining suicide resources in phone contacts were particularly robust and sustained beyond the immediate post-training survey, as were perceived confidence and comfort in supporting youth. Safe firearm and medication storage practices also improved; however, only 29% of trainees reported secure storage of medications at follow-up, highlighting the need for additional and/or more intensive strategies to reduce youths' access to lethal means. Overall, results indicate AiC holds promise as a feasible and acceptable suicide prevention strategy for use in collaboration with schools.

**Keywords** Suicide prevention · Parents · Families · Interconnected systems framework

## Introduction

Youth suicide is a significant public health concern in the USA, ranking as the second leading cause of death for youth and young adults (Curtin & Garnett, 2023). Since the start of the COVID-19 pandemic, rates of suicidal ideation and attempts among youth have increased dramatically, resulting in an increase in pediatric patients presenting to emergency departments with thoughts and behaviors about suicide (Zipursky et al., 2023). Rates of adolescent depression and anxiety—major risk factors for suicidal thinking and behavior—are also at historically high levels (Benton et al., 2021, 2022; Wilson & Dumornay, 2022). According to the Youth Risk Behavior Survey conducted by the CDC in 2023, 39.7% of students experienced persistent feelings of sadness and hopelessness, 28.5% experienced poor mental health, 20.4% seriously considered attempting suicide, and 9.5% attempted suicide. Parents/caregivers providing monitoring and support are identified as being a critical protective factor in mitigating the mental health challenges of youth (Verlenden et al., 2024).

The American Academy of Pediatrics, the American College of Emergency Physicians, and the Emergency Nurses Association have called for schools to become more involved in suicide prevention efforts (Saidinejad et al., 2023). Schools have a critical role especially, considering a nationwide shortage of mental health professionals (Hertz & Barrios, 2021; Hoffmann et al., 2023). Research shows that

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school-based interventions are associated with significant odds reductions of youth suicidal ideation attempts (Walsh et al., 2023). Research also suggests that the efficacy of school-based suicide prevention programs may be enhanced by extending the duration of interventions and incorporating multiple community stakeholders, such as community-based organizations and families (Hertz & Barrios, 2021). Overall, school-based prevention efforts for suicidal behaviors show promise, but more studies are needed especially, as they relate to the integration of other key stakeholders to draw conclusions (Gijzen et al., 2022).

For schools to fulfill their promise as a safe place where youth have access to mental health promotion and suicide prevention programming, implementation frameworks such as Multi-Tiered System of Supports (MTSS) can support adoption and sustainment of selected strategies. MTSS is a framework for enhancing the implementation of evidence-based practices to achieve important outcomes from general classroom instruction to targeted interventions for all students; it is comprised of four essential elements: screening, progress monitoring, multi-tiered prevention, and data-based decision-making. The Interconnected Systems Framework (ISF; Barrett et al., 2013) is a newer school implementation framework that is focused on the provision of mental health services in schools. ISF calls for school-based mental health professionals, community providers, and families to work together to align mental health initiatives, including suicide prevention, trauma-informed practices, bullying prevention, and restorative practices for discipline within the school district system. The goal of ISF is to remove silos from school-based mental health efforts that inherently must engage all school staff, community-based providers, and families to encourage collaboration across the necessary stakeholders to support students. A randomized control trial of ISF frameworks for school mental health found that schools adopting ISF reported greater success in identifying students in need and successfully connecting them to mental health interventions as well as greater reductions in disciplinary referrals, and exclusionary discipline (Weist et al., 2022).

## Gatekeeper Training and Youth Suicide Prevention

Among school-based suicide prevention interventions, gatekeeper training (GKT) for school staff is recognized as a strategy for youth suicide prevention although it has not been studied if GKT affects participant behavior or students' suicidal behavior (Burnette et al., 2015; Mo et al., 2018). GKT teaches individuals who regularly interact with youth to identify warning signs, to provide support and to ask about suicide, and to connect those experiencing suicidal thoughts or behaviors to appropriate resources. Evidence suggests that GKT for school staff can improve participants' knowledge and attitudes about suicide prevention, as well as

self-efficacy and intention to intervene with students who are at risk for suicide (Holmes et al., 2021a, 2021b; Morton et al., 2021; Spafford et al., 2024). However, the efficacy of GKT programs can vary across targeted populations and with the inclusion of specific practice elements such as role plays (Holmes et al., 2021a, 2021b; Robinson-Link et al., 2020). Systematic reviews of GKT indicate that current programs underutilize family members and students in the development and implementation of suicide prevention training, which may be due to logistical barriers and a lack of bandwidth of school staff to coordinate and maintain these activities (Morton et al., 2021). GKT aligns well with ISF principles because it can be integrated in a way that fosters connection between school staff, families, and community resources to deliver a comprehensive, multi-tiered system of support for student mental health (Isaac et al., 2009). The significance of GKT is further underscored by the fact that 39 US states currently mandate some form of suicide prevention training for school personnel (Salko, 2023).

## Incorporating Parents and Caregivers into GKT

Despite the importance of adopting a comprehensive approach to suicide prevention (Walsh et al., 2023), research on GKT strategies specifically targeting parents and caregivers is limited. In a review of 17 GKT studies, including those conducted in school settings, Morton et al. (2021) found that only 3 studies focused on the parents and caregivers of suicidal individuals. Among these three studies, only one actively involved parents and caregivers in the development and implementation of GKT. It is vital that parents and caregivers know how to support their child who is considering suicide as they can make the situation better or worse.

Involving parents and caregivers in the development and implementation of GKT has the potential to strengthen the intervention (Schlichthorst et al., 2020). Parents and caregivers with children who are suicidal have unique perspectives to share about signs they may have missed or about how they were helpful or hurtful in supporting their child. By providing a safe space for open communication between trainers and trainees who share similar lived experiences, peer interactions within school-based GKT suicide prevention approaches may enhance their effectiveness. The inclusion of parents and caregivers in the development and facilitation of GKT programs can tailor suicide prevention training to the specific needs and concerns of school communities, making it more relevant and impactful. Moreover, the collaboration among schools with parents and caregivers through family-to-family GKT training delivery can foster a stronger sense of community, promote early intervention, and improve overall suicide prevention efforts by increasing the credibility of trainers and creating a more responsive support system for students.

The current study evaluated the feasibility, acceptability, and short-term outcomes of the Asking is Caring (AiC) program as implemented in two school districts in the Pacific Northwest. AiC is a comprehensive approach to suicide prevention that incorporates that perspectives of key stakeholders. This study reports on AiC for parents and caregivers, which was developed by suicide prevention experts in collaboration with parents and caregivers who are passionate about youth mental health. The AiC program for parents and caregivers has 4 core features: (1) it is designed to be delivered in partnership with school districts as part of a multi-tiered and community engaged system of student supports; (2) it includes action-oriented curriculum elements focused on developing knowledge (e.g., of suicide risk factors), building skills (e.g., empathic listening), and promoting behavior change (e.g., reducing access to lethal means); (3) it is delivered by parents and caregivers to parents and caregivers (i.e., family to family), creating a safe space for families and community members to co-learn and share their experiences; and (4) school staff attend the AiC for parent and caregiver trainings so that any parents and caregivers in attendance who have current concerns about their student can get support they need.

This study contributes to the limited body of research on school-integrated, family-to-family approaches to youth suicide prevention by addressing the following research questions:

1. What are participants' attitudes and beliefs about the AiC for parents and caregivers training, including perceived impact and satisfaction?
2. To what extent does participation in the AiC training for parents and caregivers lead to changes over time in participants' knowledge, self-efficacy, and behaviors related to adolescent mental health and suicide?

## Method

### Study Design and Setting

The current study employed a single-group pre-post design with an immediate post-test and a 3–8 week follow-up assessment. Since this project was a program evaluation, and part of a quality improvement initiative that was not intended to generate generalizable knowledge, it did not require University of Washington IRB approval. The primary purpose of the data collection for AiC program for parents and caregivers was to inform a decision about whether to continue to offer the AiC program delivered by parents/caregivers.

This study was conducted across two school districts with distinct student enrollment profiles (Table 1). District 1 (792 students) and District 2 (14,356 students) represented small

**Table 1** School district enrollment characteristics

| Characteristic | District 1 | District 2 | Washington state |
|---|---|---|---|
| Total enrollment | 792 | 14,356 | 1,100,059 |
| *Gender (%)* | | | |
| Female | 46.3 | 48.3 | 48.0 |
| Male | 53.7 | 51.6 | 51.5 |
| Non-binary | – | 0.1 | 0.5 |
| *Race/ethnicity (%)* | | | |
| American Indian/Alaskan native | 0.5 | 0.3 | 1.2 |
| Asian | 0.4 | 3.5 | 8.9 |
| Black/African American | 1.1 | 1.3 | 4.7 |
| Hispanic/Latino | 43.2 | 22.7 | 26.2 |
| Native Hawaiian/Pacific Islander | – | 0.2 | 1.4 |
| Two or more races | 2.3 | 5.6 | 9.1 |
| White | 52.5 | 66.3 | 48.4 |
| *Other characteristics (%)* | | | |
| English language learners | 19.3 | 6.8 | 14.3 |
| Low-income | 59.8 | 40.8 | 50.1 |
| Migrant | 5.6 | 1.6 | 2.1 |
| Students with disabilities | 16.4 | 16.0 | 16.1 |

Data provided by the Washington Office of Superintendent of Public Instruction Report Cards (2023–2024). Percentages may not sum to 100 due to rounding. Dashes indicate data not reported

and large district contexts, respectively. Districts 1 and 2 enrollments had a lower representation of American Indian/Alaskan Native, Asian, and Black/African American students compared to the Washington state averages. District 1 had a markedly higher proportion of Hispanic students (43.2%) compared to District 2 (22.7%) and the state average (26.2%), whereas District 2 had a higher percentage of White students (66.3%) than District 1 (52.5%) and the state average (48.4%). District 1 reported a higher proportion of English Language Learners (19.3%) than District 2 (6.8%) and the state average (14.3%). The percentage of students qualifying as low income in District 1 (59.8%) exceeded District 2 (40.8%) and the state average (50.1%). District 1 had a higher proportion of migrant students (5.6%) compared to District 2 (1.6%) and the state average (2.1%).

To recruit parent and caregiver AiC trainers, school districts used newsletters, website announcements, and social media. The parents and caregivers who stepped forward to co-develop and to deliver the GKT were often those that had lived experience supporting their child who was at risk. One of the parent trainers had lost his own child to suicide. Three AiC trainings were held in District 1 and ten in District 2 during the 2023–2024 school year. Approximately 220 parents and caregivers in both school districts attended these events, and 191 completed a baseline survey that provides demographic and other information about the participants.

## Asking is Caring (AiC) Training Program for Parents and Caregivers

### Program Components

AiC is designed to be delivered by caregivers and parents in partnership with school districts. The AiC training covers 5 sections, each designed to promote knowledge gain, skill development, and/or behavior change by parents and caregivers:

1. Look: Participants were trained to change their lens from passive application of suicide prevention skills to the reality that they currently know a student who is at risk for suicide. In this section, participants learned how to identify protective factors, risk factors, and familiarized themselves with warning signs.
2. Listen: Participants were taught the importance of active listening to build connection with youth. In this section, participants are provided with examples of how to support empathy, validate feelings, and to step away from judgment and problem-solving on behalf of the student.
3. Ask: Participants were trained in how to ask directly about suicide and the essential follow-up questions about plans and means that are vital to mitigating risk. This section includes substantial behavioral rehearsal to reduce participants' anxiety about having such conversations.
4. Act: Participants received education on lethal means safety and practical steps they can use to make their homes safer immediately including safe storage of medications and firearms. In this section, participants determine specific action steps they can take in their own homes.
5. Connect: Participants are educated on the importance of building connection for individuals in crisis. In this section, local resources are presented as well as options such as using 988, a 24/7 nationwide behavioral health crisis line.

Across all the above sections, the AiC program offered a safe space for parents and caregivers to share their lived experiences and concerns about their students, creating a safe environment for peer support to occur.

### Program Implementation

District staff identified potentially interested parents/caregivers to lead the training, scheduled and marketed AiC training events, attended AiC presentations to connect training participants with school and community resources, and offered collateral materials. AiC sessions typically lasted 90 min and were held in the evenings or during the lunch hour to accommodate parents' and caregivers' schedules.

To ensure effective program delivery, AiC utilized a training-of-trainers (ToT) model. Parents and caregivers recommended by district personnel as potential trainers were sent an email about the AiC project and invited to participate in a brief interview with the AiC research team. Fourteen parent/caregiver trainers were selected for the first cohort, with 11 completing the ToT program. Each trainer underwent up to 16 h of training and coaching to prepare them to teach the curriculum. Following a 1 day training in-person training event, trainers were placed into dyads to deliver the curriculum and received coaching online until they demonstrated proficiency in teaching the curriculum. Parents who completed the ToT received a small stipend of $200 to compensate them for any time taken from work and $20 for each AiC training session that they delivered.

### Evaluation Overview

Surveys assessed AiC participants' knowledge, attitudes, beliefs, self-efficacy, and behaviors related to youth suicide prevention and the AiC program (e.g., trainers and materials). Participants completed a pre-test survey (i.e., immediately preceding the AiC training), a post-test survey (i.e., immediately following the training), and a follow-up survey (3–8 weeks after the training). Participants completed all surveys online via the Research Electronic Data Capture (REDCap) system (Harris et al., 2009).

### Measures

#### Demographic Characteristics

Self-reported demographic information was collected during the pre-test assessment, including age, gender (i.e., male, female, or non-binary), race/ethnicity (i.e., Hispanic, non-Hispanic Asian, non-Hispanic Black, non-Hispanic Other/mixed race, or non-Hispanic White), educational attainment (i.e., high school or equivalent, some college, associate's degree, Bachelor's degree, Master's degree, or Doctorate or professional degree), and marital status (i.e., never married, married, or divorced).

#### Knowledge

Gains in knowledge about AiC materials, youth suicide, and firearm suicide were assessed using 2 sets of measures. First, AiC Mastery was evaluated by 2 items administered at post-test (immediately after completion of the training). Participants rated their level of competence (1 = Complete Beginner and 10 = Fully Expert) with the information, tools, and skills described in the AiC program 1) before the

training (i.e.,, "BEFORE the training took place, what was your level of competence with the information, tools and/or skills described in Asking IS Caring?") and 2) their current level of competence after the training ("How would you rate your current level competence with the information, tools and/or skills described in Asking IS Caring?"). Second, knowledge about youth suicide prevalence and firearm suicide prevalence was assessed using 2 multiple-choice items at pre-test, post-test, and follow-up assessments to examine changes over time. The youth suicide prevalence item asked, "Of children and youth ages 10–18, what percentage of deaths are due to youth suicide?" The firearm suicide prevalence item asked, "In approximately what percentage of youth suicides by firearms is a family member's firearm used?" Both items had 5 possible responses and were scored as correct or incorrect.

### Attitudes

Attitudes about lethal means storage were assessed only at post-test using a single item. Participants were asked "Did the information shared in this training make you feel differently about your current firearm and medication storage practices?" This item was then coded into a dichotomous response (Yes versus unsure/no).

### Training Satisfaction

Satisfaction with the AiC training and trainer was assessed using four items administered only at post-test. Training satisfaction and workbook satisfaction were both rated on a 5-point Likert scale from 1 = Very Satisfied to 5 = Very Unsatisfied. Training impact and trainer credibility were assessed using a 10 point Likert scale (1 = No impact/no credibility to 10 = Profound/Enduring impact/unsurpassed credibility).

### Self-efficacy

Self-efficacy in youth suicide prevention was assessed using 2 sets of measures. First, 2 items were administered at post-test: likelihood of using AiC to intervene with youth at risk for suicide (5 point Likert scale, 1 = Very Likely and 5 = Very Unlikely) and interest in becoming an AiC trainer (Yes versus No). Second, 2 items were administered at pre-test, post-test, and follow-up: confidence in helping adolescents at risk of suicide and comfort intervening with adolescents at risk of suicide. Both items were rated on a 5 point Likert scale from Strongly Agree to Strongly Disagree. These items were coded into a dichotomous variable: strongly agreed/agreed versus neutral/disagree/strongly disagree.

### Behavior

Five behavioral measures relevant to the AiC program were assessed at pre-test, post-test, and follow-up assessments. Firearm storage practices were evaluated using 2 separate items: Whether all household firearms were unloaded, and whether all household firearms were stored in a locked place (Yes versus no). Medication storage practices were assessed using two separate items: Whether all or some medications were stored in a locked place (All/some versus none), and whether expired/unused medications were always removed from the home (Yes versus no). Practicing empathy with one's child was measured using a single item (All/most of the time versus some of the time/rarely/almost never). Finally, participants were asked if they had the suicide hotline number (988) or the crisis text line (741–741) was saved in their phone contacts (Yes versus No).

### Data Analysis

Descriptive statistics, including frequency distributions, means, and standard deviations, were used to summarize the demographic characteristics for all participants who completed the Asking is Caring (AiC) pre-test survey ($n = 191$). These characteristics included age, gender, race/ethnicity, educational attainment, and marital status. Descriptive statistics were also used to summarize knowledge, attitude, beliefs, and self-efficacy measures for the participants who completed the post-test survey ($n = 142$; 74.3% of all participants).

To estimate differences in dichotomous measures of knowledge, self-efficacy, and behaviors between study timepoints (i.e., pre-test versus post-test; pre-test versus follow-up), logistic regression models with standard errors clustered on the participant identification number were employed. Logistic regression was appropriate because all outcomes assessed over the course of the AiC study were binary. From these models, independent sample t-tests were used to estimate differences in the marginal probabilities of outcomes between survey periods. It is important to note that some outcomes were treated as binary, even though they were originally measured on a Likert scale (i.e., efficacy outcomes), to provide more intuitive results for practitioners and community partners, such as whether participants indicated confidence (or not) after the training. Only participants who completed the pre-test and post-test surveys ($n = 142$) or the pre-test and follow-up surveys ($n = 64$) were included in these analyses. For analyses of change from pre-test to follow-up, we removed participants who did not complete the follow-up within the 3–8 week window ($n = 25$) to ensure that the follow-up assessments were comparable across participants. Variations in the timing of the follow-up could lead

to differences in the participants' experiences, knowledge retention, and behavior changes, which could confound the interpretation of the results.

All statistical analyses were conducted using STATA 17.

## Results

### Demographic Characteristics

A total of 191 AiC participants completed the pre-test survey (Table 1). Participants' age ranged from 20 to 76 years, with a plurality aged 40–49 years (44.5%). Nearly three-quarters of the participants were female (74.3%), and over three-quarters identified as non-Hispanic White (75.9%). The sample was highly educated, with 68.0% holding a bachelor's degree or higher, including 25.1% with a Master's degree and 9.4% with a Doctorate or professional degree. Most participants were married (87.4%), with smaller proportions reporting being single/never married (6.3%) or divorced (5.8%). All the participants were parents/caregivers with about one-third (35.2%) indicating that they have a current concern for their student related to mental health or suicide (Table 2).

### Post-test Assessments

Table 3 presents the results of the post-test assessments (n = 142). Participants reported a mean AiC mastery score of 7.40 (SD = 1.34) on a 10 point scale after completing the training, with 87.4% reporting improved mastery (as compared to pre-training). Most AiC participants (90.0%) reported a change in their attitudes about lethal means storage following the training. Overall, AiC participants expressed high levels of satisfaction with the training (M = 1.20, SD = 0.51) and the workbook (M = 1.57, SD = 0.73). Participants also reported a high likelihood of using AiC to intervene with youth at risk of suicide (M = 1.30, SD = 0.50), and 21.7% expressed interest in becoming an AiC trainer.

Participants perceived the training as having a strong impact (M = 8.35, SD = 1.40) and rated the trainers as highly credible (M = 9.30, SD = 1.37). Because the research team uses the same items (e.g., anticipated impact and trainer credibility) to evaluate many types of training provided by the larger center (Olson et al., 2021), it can compare these results to trainings of similar structure and duration. Mean training impact and trainer credibility scores from participants (n = 792) in comparable training courses focused on school-based services were found to be 7.72 and 8.87, respectively, further indicating the positive appraisal of the AiC training.

**Table 2** Demographic characteristics of asking is caring participants (n = 191)

| Demographic | n | % |
|---|---|---|
| *Age* | | |
| 20–29 years | 10 | 5.2% |
| 30–39 years | 46 | 24.1 |
| 40–49 years | 86 | 44.5 |
| 50–59 years | 27 | 13.6 |
| 60 years and above | 10 | 5.8 |
| Missing | 12 | 6.8 |
| *Gender* | | |
| Female | 141 | 74.3% |
| Male | 40 | 20.9 |
| Non-binary | 2 | 0.5 |
| Missing | 8 | 4.2 |
| *Race/ethnicity* | | |
| Hispanic | 27 | 13.6% |
| NH asian | 10 | 4.7 |
| NH black | 2 | 0.5 |
| NH other/mixed | 6 | 3.7 |
| NH white | 144 | 75.9 |
| Missing | 2 | 1.6 |
| *Educational attainment* | | |
| High school or equivalent | 8 | 4.2% |
| Some college | 34 | 17.8 |
| Associate's degree | 19 | 9.9 |
| Bachelor's degree | 65 | 33.5 |
| Master's degree or higher | 48 | 25.1 |
| Missing | 0 | 9.4 |
| *Marital status* | | |
| Single/never married | 11 | 6.3% |
| Married | 166 | 87.4 |
| Divorced | 11 | 5.8 |
| Missing | 3 | 0.5 |

All demographic information was collected during the pre-test

### Change from Pre-test to Post-test

Table 4 shows the differences in knowledge and self-efficacy from pre-test to immediately after AiC training (n = 142). Significant improvements were observed in participants' knowledge of youth suicide prevalence (53.2 percentage point increase, 95% CI: 44.0, 62.4) and firearm-related youth suicide prevalence (17.4 percentage point increase, 95% CI: 8.6, 26.2). Self-efficacy also significantly increased, with participants reporting greater confidence in helping youth at risk of suicide (54.6 percentage points, 95% CI: 46.1, 63.1) and comfort intervening with youth at risk (25.5 percentage points, 95% CI: 17.3, 33.8).

**Table 3** Asking is caring post-test assessments (*n* = 142)

| Variable | %/M | (SD) | Likert scale range (label) | N (% miss) |
|---|---|---|---|---|
| *Knowledge* | | | | |
| AiC Mastery | 7.4 | (1.34) | 1 (Complete beginner–10 Fully expert) | 139 (2.0%) |
| Difference in AiC mastery[a] | 2.61 | (1.83) | – | (4.9%) |
| Improved mastery | 87.4% | – | – | |
| No change/reduced mastery | 17.0 | – | – | |
| *Attitudes* | | | | |
| Change in firearm/medicine storage attitudes | | | – | 148 (1.4%) |
| Yes | 90.0% | – | – | |
| Not sure | 2.1 | – | – | |
| No | 7.9 | – | – | |
| *Beliefs* | | | | |
| Training satisfaction | 1.20 | (0.51) | 1 (Very satisfied–5 Very unsatisfied) | 141 () |
| Workbook satisfaction | 1.57 | (0.73) | 1 (Very satisfied–5 Very unsatisfied) | 142(0%) |
| Training impact | 8.35 | (1.40) | 1 (No impact–10 Profound impact) | 139 (%) |
| Trainer credibility | 9.30 | (1.37) | 1 (No credibility–10 Unsurpassed credibility) | 150 (0%) |
| *Self-efficacy* | | | | |
| Use AiC to intervene with youth | 1.30 | (0.50) | 1 (Very likely–5 Very unlikely) | 148 (1.3%) |
| Become an AiC trainer | 21.7% | – | – | 93 (38.0%) |

AiC, Asking is Caring; M, Mean; SD, Standard deviation; n, Number of participants. For continuous variables, the mean (standard deviation) is presented. For categorical variables, the percentages are presented

[a] As part of the post-test, participants rated their perceived mastery of AiC materials 1) prior to the training and 2) after the training. Difference in AiC mastery is the absolute difference between these two ratings

**Table 4** Knowledge and self-efficacy outcomes at pre-test and post-test (*n* = 142)

| | Pre-test | Post-test | Post-versus pre-test (95% CI) | % miss |
|---|---|---|---|---|
| *Knowledge* | | | | |
| Youth suicide prevalence[*] | 34.8% | 87.9% | 53.2 (44.0, 62.4) | 0.7% |
| Firearm suicide prevalence[*] | 58.7% | 76.1% | 17.4 (8.6, 26.2) | 2.7% |
| *Self-efficacy* | | | | |
| Confidence helping youth[*] | 36.2% | 90.8% | 54.6 (46.1, 63.1) | 0.7% |
| Comfort intervening with youth[*] | 65.2% | 90.7% | 25.5 (17.3, 33.8) | 0.7% |

% Miss represents the proportion of respondents who did not answer the respective survey item

[*] $p < 0.05$ (Pre-test versus post-test) based on independent sample t-test of logistic regression estimated probabilities

## Change from Pre-test to Follow-up

Table 5 presents the changes in knowledge, self-efficacy, and behaviors between the pre-test and follow-up survey 3–8 weeks after AiC training (*n* = 64). Knowledge of youth suicide prevalence significantly increased (17.2 percentage point increase, 95% CI: 0.2, 32.7); knowledge of firearm suicide prevalence increased 6.3 points, but this was not significant. Significant increases were found in participants' confidence in helping youth at risk of suicide (47.6 percentage points, 95% CI: 34.4, 60.8) and comfort intervening with youth at risk (20.6 percentage points, 95% CI: 6.5, 34.8).

Regarding behaviors, among participants with household firearms (*n* = 28), there was a significant increase in the proportion who reported storing all firearms locked (14.3 percentage points, 95% CI: 1.1, 27.5); the proportion of participants who reported they kept all their firearms unloaded decreased 3.6 percent, but this was not significant. Significant improvements were observed in the proportion of participants who reported locking up all or some medicines (19.4 percentage points, 95% CI: 8.5, 30.2) and always removing expired or unused medicine (15.0 percentage points, 95% CI: 0.4, 29.6). In the AiC follow-up, participants were more likely to report practicing empathy with

**Table 5** Knowledge, self-efficacy, and behavior outcomes at pre-test and follow-up ($n = 64$)

| | Pre-test | Follow-up | Follow-up vs. pre-test (95% CI) | % miss |
|---|---|---|---|---|
| *Knowledge* | | | | |
| Youth suicide prevalence[*] | 31.3% | 48.4% | 17.2 (0.2, 32.7) | 0.0% |
| Firearm suicide prevalence | 54.7% | 60.1% | 6.3 (−6.8, 19.3) | 0.0% |
| *Self-efficacy* | | | | |
| Confidence helping youth[*] | 27.0% | 74.6% | 47.6 (34.4, 60.8) | 0.7% |
| Comfort intervening w/ youth[*] | 55.6% | 76.2% | 20.6 (6.5, 34.8) | 0.7% |
| *Behaviors* | | | | |
| All firearms unloaded[a] | 85.2% | 89.5% | 3.7 (−16.4, 9.0) | 9.5% |
| All firearms stored and locked[a][*] | 67.8% | 82.1% | 14.3 (1.1, 27.5) | 4.8% |
| All/some medicines stored and locked[*] | 9.7% | 29.0% | 19.4 (8.5, 30.2) | 1.3% |
| Always remove expired/unused medicine[*] | 28.3% | 43.3% | 15.0 (0.0, 29.6) | 2.7% |
| Practice empathy w/ child[*][b] | 58.3% | 83.3% | 25.0 (10.5, 39.5) | 2.7% |
| Suicide hotline in phone contacts [*] | 9.5% | 52.4% | 42.9 (29.8, 55.9) | 0.7% |

% Miss represents the proportion of respondents who did not answer the respective survey item

[*] $p < 0.05$ (Pre-test versus follow-up) based on independent sample t-test of logistic regression estimated probabilities

[a] Firearm-related measures included only participants who reported having household firearms ($n = 28$)

[b] Nine respondents in the pre-test and four respondents in the pre-test and follow-up, respectively, indicated that this question was not applicable and thus were removed

their child (25.0 percentage points, 95% CI: 10.5, 39.5) and having suicide prevention resources saved in their phone contacts (42.9 percentage points, 95% CI: 29.8, 55.9).

## Sensitivity Analysis

We performed a sensitivity analysis (see Online Supplement) to examine potential nonresponse bias by comparing demographic characteristics between participants with and without follow-up data (Table A1) and analyzing program outcomes using logistic regression models and McNemar's symmetry tests (Tables A2 and A3). Compared to participants with follow-up data, those lost to follow-up were significantly more likely to be male (25% vs. 5%, $p = 0.002$). No other significant demographic differences were observed between groups, suggesting that apart from gender, follow-up data were generally missing at random. Logistic regression results (Table A2) confirm the magnitude and direction of effects seen in the main analysis (Tables 4 and 5), with statistically significant improvements observed in most outcomes. McNemar's symmetry tests (Table A3) further validate these findings, confirming significant within-subject changes from pre-test to post-test and pre-test to follow-up for most outcomes. Notably, the odds ratios for all outcomes remained consistent with the estimated probabilities presented in the main tables, supporting the robustness of our findings. Although the smaller sample size at follow-up resulted in wider confidence intervals, the statistical significance patterns remained largely unchanged, with sustained improvements in key self-efficacy and behavioral outcomes.

The consistency of these results across different analytical approaches strengthens our confidence in the intervention's effectiveness despite attrition at follow-up.

## Discussion

AiC for parents and caregivers aims to fill a gap in school-based suicide prevention programming by providing a GKT training for parents and caregivers that focuses on promoting adult knowledge, skills, and behavior for reducing youth suicide risk. AiC participants reported improved knowledge, self-efficacy, attitudes, and behaviors related to youth suicide prevention. Changes in self-reported use of empathic listening with youth and maintaining suicide resources in phone contacts were particularly robust and sustained beyond the immediate post-training survey, as was perceived confidence and comfort in supporting youth. Safe firearm and medication storage practices also improved; however, only 29% of trainees reported secure storage of medications at follow-up, highlighting the need for additional and/or more intensive strategies to reduce youths' access to lethal means.

By designing AiC to be delivered family to family, we sought to engage parents and caregivers in safe conversations about youth suicide prevention before their student may be at risk. What typically happens is that information about lethal means storage and how to support students may be provided by school personnel only in the event a student is already struggling. AiC is a programming option that has the potential to fit well within a single system of mental

health promotion and youth suicide prevention that is coordinated across schools, families, and community, as per the ISF framework (Barrett et al., 2013).

At only 90 min, the AiC training can be incorporated into a typical school event that is targeted at parents and caregivers, such as a Parent–Teacher Association meeting. Components of the messaging can also be shared periodically throughout the school year through school newsletters and flyers promoting lethal means storage and tips for supporting youth. A digital version of the training can also be created and disseminated for those who were unable to attend the AiC program in person.

Several AiC participants reported an interest in providing support for the school's mental health mission, as future AiC trainers, but also in other ways such as advising on committees, doing outreach to communities not as well represented at school functions, through fundraising or providing peer support. AiC has the potential to serve as an efficient Tier 1 (universal school-wide) strategy in a multi-tiered system of school supports for suicide prevention. AiC programming scheduled at regular intervals, with the dates of AiC programs accessible to school personnel who could share this information with parents and caregivers who have students of concern are also needed. AiC parent/caregiver trainers were willing, with additional training, to provide peer support to families whohave a student who was struggling. The next step is to consider how peer support can work as a Tier 2 and 3 suicide prevention strategy in schools. It may be helpful to provide parents and caregivers with students who are struggling with peer support.

Results from this initial pilot in 2 school communities show that parents/caregivers who served as AiC trainers have significant credibility. This finding is not surprising given that parents and caregivers may be more receptive to lessons on topics such as firearms storage and having difficult conversations with one's child when it is delivered by another parent or caregiver than for example, by a school or mental health professional (Bowersox et al., 2021; Morton et al., 2021; Schlichthorst et al., 2020). The AiC family-to-family delivery model is distinct from traditional GKT programs where professionals train lay people. Peer-to-peer models such as AiC can be helpful in generating practical solutions and emotional rapport quickly because of shared lived experiences and a reduction in power dynamics.

The ratings of the perceived impact of the training were also high, as were ratings of satisfaction with the curriculum and collateral materials. Most importantly, AiC participants reported improved knowledge, self-efficacy, attitudes, and behaviors related to youth suicide prevention. Changes in self-reported use of empathic listening with youth and maintaining suicide resources in phone contacts were particularly robust and sustained beyond the immediate post-training survey, as was perceived confidence and comfort in supporting youth. Firearm and medication storage practices also were found to improve significantly and to sustain 3–8 weeks' post-training.

It is worth noting, however, that only 29% of trainees reported secure storage of medications at follow-up. Although this was a significant improvement from 10% at baseline, the result highlight the need for additional and/or more intensive, program strategies to reduce youths' access to lethal means. Continued messaging to parents/caregivers is needed to educate about the dangers associated with having unlocked prescription and over-the-counter medications in the home. Future studies should measure longer-term changes with AiC program participants while providing additional messaging about the importance of safe storage of medications and firearms in the home.

## Implications for School Mental Health

The results of this initial pilot are encouraging and have prompted the research team to continue development and testing of AiC. Although focused on feasibility, acceptability, and short-term outcomes, the results were robust for participants who received the training and completed the surveys. Parents and caregivers can and should be integrated into school-based suicide prevention strategies, not only as members of ISF teams that give input on district-level policies and protocols, but also as individuals who can deliver training, and perhaps offer peer support, to this key stakeholder group. Parents and caregivers who are trained appear to be willing and able to work with districts to disseminate key information, teach skills that may reduce risk of suicide among youths, and increase parent and caregiver and community member self-efficacy around intervening when necessary. Future research will be required to explore whether use of AiC, in combination with other strategies, can help to address the increasing rates of youth suicidality in communities and schools.

Beyond initial evidence for the feasibility and potential efficacy of the packaged AiC training curricula for parents and caregivers, the study points to potential opportunities for improving other kinds of youth suicide prevention programming. For example, the Look, Listen, Ask, Act, and Connect steps provide a programmatic heuristic based on evidence that can be translated to GKT training for other audiences. As a result, the study team has worked to develop complementary curricula for school mental health professionals, students, teachers, and school staff. Such efforts can allow curricula to be customized to different schools and stakeholder groups offering a common language when it comes to the skills taught in the training to identify and support students who are at risk. AiC curriculum material for all stakeholder groups must be inclusive of clear protocols and

policies for how to respond when there is a youth who is at risk.

There is the potential to sustain and increase the reach and collaboration between schools and family partners. However, school personnel need bandwidth to coordinate these efforts and to embrace them fully. It has to be part of someone's job in the school or district to sustain and to grow efforts with parents and caregivers.

## Limitations

Although the results of this initial feasibility pilot are encouraging, several methodological limitations should be noted. The study is limited by small sample sizes, the absence of a control group, and reliance on self-report rather than objective measures of behavior change. Our measurement approach also had several weaknesses: Dichotomous measures reduced the granularity of results; knowledge was assessed using only two multiple-choice questions and was retrospectively assessed with "before" and "after" questions administered at post-test. Ideally, this measure would be administered at baseline and the post-test. Additionally, attitude changes about lethal means storage were assessed with a single, dichotomous measure including both firearms and medication. These measurement limitations should be addressed in the future work evaluating AiC.

The follow-up window (3–8 weeks) reduced our ability to interpret the durability of effects and standardize comparisons across participants. This timing variability presents challenges for determining sustained impact. Additionally, a substantial proportion of participants were lost to follow-up, which can occur in gatekeeper training programs (see Holmes, Herman, & Lagapoulos, 2021a). Future work should employ more rigorously applied follow-up protocols with standardized assessment timepoints, comprehensive measurement approaches, and perhaps longer-term follow-up (e.g., 1 year post-training).

Additionally, all study sites were from rural areas in a Pacific Northwest state; findings may not generalize to other districts and communities. The participating school districts enrolled lower rates of Black, Native American/Alaskan Native, and Asian students than the state average. Further, most AiC trainees were White, college graduates, and married, characteristics not necessarily representative of all parents and caregivers in these communities. Future evaluation and research—and future AiC training efforts—should aspire to engage and recruit parents and caregivers who are fully representative of the communities served by the school districts. Further, AiC training assessments should seek to recruit adequate sample sizes across demographically diverse school districts to test whether the program is effective across sociocultural contexts.

## Conclusion

GKT is a promising method for increasing parent and caregiver knowledge about youth suicide. Universal dissemination of GKT to all groups including parents and caregivers, students, teachers/staff, and school mental health professionals is critical to maximizing the capacity to identify and intervene with youth who may be at risk for suicide. Whenever feasible, GKT also should be accompanied by universal screening, safety planning and follow-up protocols, triage, referral, and school reengagement strategies that are beyond the scope of this study but must be calibrated depending on district level and community resources. While GKT curricula such as AiC for parents and caregivers can and should be used regardless of the extensiveness of such school and district supports, our collective efforts to address the crisis of youth suicide will be best achieved by greater integration of suicide prevention programming within existing school initiatives such as MTSS and ISF.

## Declarations

**Conflict of interest** The author has no conflicts of interest to report.

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