Community Mental Health Journal
https://doi.org/10.1007/s10597-022-01084-9

ORIGINAL PAPER

Changes in Gatekeeper Beliefs Following ASIST and Relation to Subsequent Gatekeeper Suicide Prevention Behaviors

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Received: 27 July 2022 / Accepted: 22 December 2022

Abstract
This study examines relations between suicide prevention gatekeeper beliefs and actual helping behaviors following participation in Applied Suicide Intervention Skills Training (ASIST). Participants (n = 434) completed measures examining suicide-related beliefs and behaviors using a naturalistic pre-post design. All beliefs demonstrated significant change from pre- to posttest. Regression analyses indicate that beliefs about perceived barriers to action and the controllability of suicide predicted identification of high-risk youth; perceived barriers to action were also negatively related to helping responses and referrals 6–9 months post training. Self-efficacy was not related to suicide prevention behaviors at follow-up. The importance of anchoring training curriculums and measurement to health behavior change theories is discussed.

Keywords Gatekeeper training · Health behavior change · ASIST · Suicide prevention

Introduction

Suicide is a leading cause of death globally and the second leading cause of death for people ages 10–14 in the United States (Centers for Disease Control and Prevention, 2020). The extent of suicide-related injuries and deaths supports the need for large scale public health approaches to suicide prevention, which include multidisciplinary interventions that are broad in scope, preventive in nature, and employ evidence-based strategies targeting individuals, families, communities, and society at large (U.S. Department of Health and Human Services Office of the Surgeon General & National Action Alliance for Suicide Prevention, 2012).

Gatekeeper Training

Gatekeeper training (GKT) is a core component of a public health approach to suicide prevention. Gatekeepers (GK) are trained individuals who act as a source of help and support in communities (Evans & Price, 2013); they can include healthcare and mental health professionals, teachers, law enforcement, peers (Gould & Kramer, 2001), or anyone who interacts with vulnerable community members. GKT is predicated on the notion that individuals at risk for suicide have identifiable risk factors that can be recognized by trained helpers and that without such caring community supports, individuals at risk may be less likely to access prevention resources themselves (Condron et al., 2014).

Studies have found that participation in GKT is associated with increased knowledge of suicide risk factors and warning signs, self-efficacy to intervene with individuals at risk for suicide, and positive attitudes towards suicide prevention (Isaac et al., 2009), with some studies demonstrating maintenance of favorable attitude changes several months post training (Botega et al., 2007; Chagnon et al., 2007; Keller et al., 2009). More recent studies suggest an impact of GKT on actual participant behaviors (e.g., identification, response, and referral of at-risk individuals; Ewell Foster et al., 2016; Kuhlman et al., 2017, 2021). Large scale studies (e.g., Godoy Garraza et al., 2019; Walrath et al., 2015) provide emerging evidence that GKT, when part of a comprehensive prevention strategy, may impact suicide mortality rates, with more robust effects over time linked to sustained implementation of programming.

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Published online: 06 January 2023

Although widely used as a prevention strategy, limited evidence exists that specifies key, highest priority concepts that must be imparted within GKT curricula or that links those learning targets to desired outcomes. Currently, there are a variety of training curricula that differ in length and emphasis with limited guidance regarding whether particular concepts might maximize the chances that gatekeepers will use the skills they have been taught. A second weakness of the GKT literature is a lack of standardization in how concepts are defined and measured, with terms such as self-efficacy, self-confidence, preparedness, controllability, or core beliefs about suicide prevention used interchangeably (Komarraju & Nadler, 2013) often under the umbrella term "attitudes." The focus of this paper is cognitive beliefs and their relation to actual behaviors. Thus, the term 'belief' will be used as opposed to 'attitude' to describe the constructs measured in this study.

Health behavior change theories, such as the Health Belief Model (Rosenstock, 1966) and the Theory of Planned Behavior (Ajzen, 1985), provide an organizing framework to identify beliefs that are hypothesized to be critical precursors for behavior change. According to these theories, an individual's enactment of GK suicide prevention behaviors is impacted by cognitive precursors that may include noticing cues regarding the need to intervene (cues to action), beliefs about the potential viability of behavioral responses to the situation (perceived barriers to action), beliefs about the extent to which GK behavior could positively influence the situation (perceived controllability), and one's confidence in their ability to engage in the desired outcome (self-efficacy). With respect to suicide prevention, cues to action would include the need for accurate information about risk factors and warning signs that would signal a GK to notice a high risk individual. Perceived barriers to action might include the worry that asking about suicide can plant the idea in someone's head, the sense that one is not responsible for discussing suicide with others, or could also include objective barriers to action such as time or lack of organizational support for suicide prevention. Perceived controllability would include one's belief that suicide is preventable. Self-efficacy is the sense that one is competent and prepared to use the skills of a suicide prevention gatekeeper.

Research shows that beliefs toward suicidality in the general public and within gatekeepers often counter those that would most align with health behavior change theories. For instance, in a study examining the perceptions of adolescents and their parents on suicide, many parents expressed concern that discussing suicide could be dangerous and might introduce the idea in the minds of adolescents (Schwartz et al., 2010). Such beliefs suggest low perceptions of benefit for intervening and potentially high barriers to action. Additionally, in a study assessing the beliefs and behaviors of emergency department staff related to the care of suicidal patients, less than half of providers believed that "most" or "all" suicides are preventable (Betz et al., 2013). Such a belief suggests low perceived controllability of suicide, thereby lowering the odds of helpful action in gatekeepers. Gould and Kramer (2001) discuss desirable beliefs toward suicide, such as taking a person's suicidal statements seriously (cues to action), and recognizing the importance of referring people to mental health professionals. Beliefs such as these are desirable in order to increase the likelihood of GK intervention behaviors.

The Present Study

The present study was designed to investigate specific, theory-driven beliefs endorsed by gatekeepers prior to and after participation in Applied Suicide Intervention Skills Training (ASIST) in order to 1) examine changes in these beliefs over time following exposure to ASIST and 2) examine whether such beliefs were related to participant behavior change 6 to 9 months post training. Prior studies have documented the importance of participant characteristics or beliefs measured prior to training in predicting utilization of GK skills (Ewell Foster et al., 2016; Wyman et al., 2008); the current study is focused on investigating relationships between beliefs measured immediately following training in order to identify specific beliefs that are empirically related to GK suicide prevention behaviors at follow-up. Guidelines designed to enhance rigor in intervention research (Raghavan et al., 2019; Sumner et al., 2018; White, 2022) recommend an expanded focus on how and not just whether interventions work. Using theory and prior research, key ingredients of the intervention are specified, examined, and linked to outcomes. These key ingredients drill down beyond nonspecific factors to elucidate factors that may be driving intervention impact. With respect to GKT, this approach, in addition to examining improvement in desired outcomes (GK behaviors), should demonstrate 1) that GKT altered hypothesized key ingredients/mechanisms of action of the intervention (in this case, beliefs specified in health behavior change theories as critical to behavior change), and 2) that the key ingredients were related to desired outcomes. Figure 1 illustrates the research design utilized in this study, depicting first the non-specific factors, or common components, that characterize the GKT literature (suicide prevention knowledge, attitudes and beliefs, and skills), next mapping these constructs onto theoretically relevant beliefs hypothesized to be key ingredients of ASIST, and hypothesizing their impact on the desired outcomes of GKT (identification of, response to, and referral of suicidal individuals).

This study was funded by The Garrett Lee Smith Memorial Act. Data were obtained in the context of meeting a statewide initiative to increase the number of trained gatekeepers. Strengths of the current study include a broad

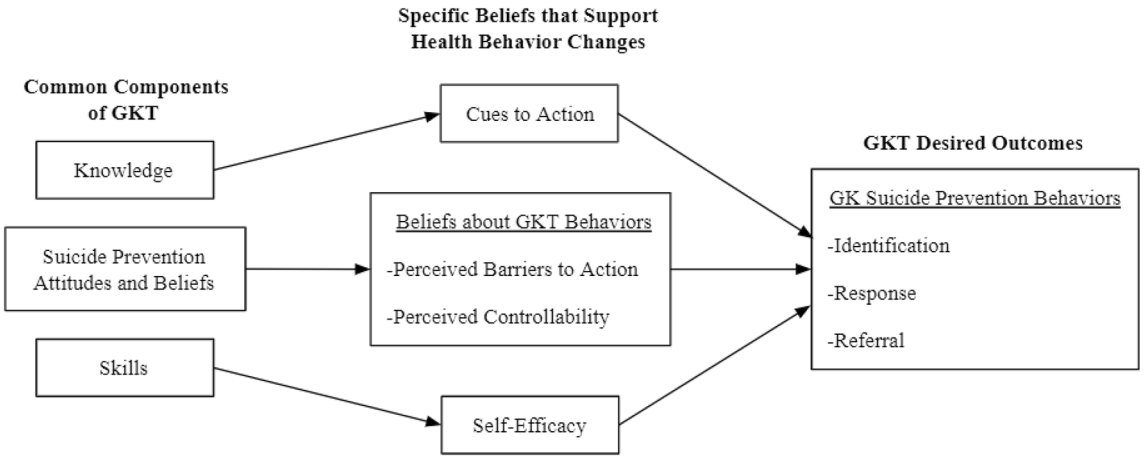

Fig. 1 Applying Health Behavior Change Theories to Identify Key Ingredients of Suicide Prevention Gatekeeper Training

community sample of participants, the use of multiple trainers, and psychometrically strong assessments (Ewell Foster et al., 2016; Wyman et al., 2008). Due to funding restrictions, a randomized controlled trial was not possible and rather a pre, post, and longitudinal follow-up design was utilized.

Method

Participants

Adults who voluntarily engaged in one of 21 state-funded ASIST trainings between July, 2010 and August, 2012 were eligible to participate. Trainings were conducted statewide in rural, suburban, and urban communities, and one Native American reservation. Trainings were locally sponsored by suicide prevention coalitions, non-profits, and community mental health agencies, and facilitated by ten certified ASIST trainers across the state. Participants included 434 adults ages 18–70 years ($M = 42.95$, $SD = 12.05$). The majority identified as female (76.7%). See Table 1 for participant characteristics. Approximately two-thirds of participants completed the follow-up survey (65.7%); follow-up participants did not differ from the full sample in terms of age, gender, race or ethnicity.

Procedures

All participants attended two full days of Applied Suicide Intervention Skills Training (ASIST)—a 16-hour intensive gatekeeper training which includes interactive role-play, as well as exercises and techniques designed to promote understanding and assistance for suicidal individuals

Table 1 Participant Demographics

Characteristic	n (%)
Gender	
Female	333 (76.7%)
Male	85 (19.6%)
Missing	16 (3.7%)
Race	
White	331 (76.3%)
Black/African American	44 (10.1%)
American Indian/Alaskan Native	9 (2.1%)
Asian	2 (0.05%)
Ethnicity	
Hispanic	12 (3.6%)
Non-Hispanic	324 (96.4%)
Occupation	
Education (K-12)	112 (33.3%)
Substance abuse treatment	45 (13.4%)
Juvenile justice/probation	37 (11%)
Emergency response	38 (11.3%)
Higher education	52 (15.5%)
Tribal services/tribal government	6 (1.8%)
Child welfare	37 (11.1%)
Mental health professional	107 (31.8%)
Primary health care	42 (12.5%)
Other community settings	94 (27.9%)

To reduce respondent burden, demographic information was collected at posttest using a survey administered by the U.S. Department of Health and Human Services (2006) Substance Abuse and Mental Health Services Administration (SAMHSA) as part of the Macro International Cross-Site Evaluation of the Garrett Lee Smith State/Tribal Youth Suicide Prevention and Early Intervention Grant Program. Sixteen participants (3.7%) did not identify their gender. Forty-eight participants (11%) did not identify their race/ethnicity

(LivingWorks, 2018). This training teaches participants how to recognize when someone has thoughts of suicide, how to support these individuals, and how to lead them to safety (Rodgers, 2010). Instructors aim to help participants feel more comfortable, skilled and confident in intervening with individuals at risk for suicide, ultimately attempting to change GK behavior (Evans & Price, 2013). Gatekeepers are taught to develop safety plans with suicidal individuals and connect them to mental health resources (Condron et al., 2014).

Informed consent was obtained from all subjects; participants completed a battery of measures prior to and immediately following the 2-day ASIST training (version 10; Rodgers, 2010). A follow-up survey was administered six to nine months later via email or mail, depending on preferred method of contact. Those who completed the follow-up survey were entered into a drawing to win one of three $50 gift cards. Research procedures were approved by the Institutional Review Board at the University of Michigan. There are no known conflicts of interest. All authors certify responsibility for this manuscript.

Measures

Measures have been previously described (Ewell Foster et al., 2016) and are based on the Gatekeeper Training Survey (Wyman et al., 2008). Responses to 35 items are measured on 7-point Likert scales with higher scores indicating higher levels of preparedness (e.g., How prepared do you feel to make appropriate referrals?), self-assessed knowledge (e.g., How much do you know about warning signs for suicide?), or self-efficacy (e.g., I feel comfortable discussing suicide issues with my youths.). In addition, a measure of suicide beliefs (used as a discussion tool within the ASIST curriculum; ASIST Suicide Attitudes Survey) added ten items (e.g., "Persons serious about suicide cannot be helped.") using a 5-point Likert scale, ranging from "Strongly agree" to "Strongly disagree."

Individual items measuring cognitive beliefs about suicide were categorized in accordance with health behavior change theories. The constructs were then empirically evaluated using Cronbach's alphas (see Table 2). Internal consistency was examined within each construct and items that reduced the alpha were removed. Since different Likert scale metrics were used throughout the original surveys, scores for each construct were summed to create composite variables. Higher scores correspond to more favorable beliefs about suicide prevention. For instance, agreeing with statements like, "I feel comfortable discussing suicide issues with youths" and "I can make appropriate referrals within my agency for youths contemplating suicide" indicate high levels of self-efficacy. Indicating self-assessed knowledge about the "signs and symptoms of suicide ideation or attempt" and "the relationship between suicide and social issues/problems" demonstrates high awareness of cues to action. Endorsing statements like, "I am too busy to participate in suicide prevention activities" and "My colleagues and I should not be responsible for discussing suicide with youths" indicate barriers to action. Disagreeing with statements such as, "If a youth experiencing thoughts of suicide does not acknowledge the situation, there is very little I can do to help" and "If a youth contemplating suicide does not seek assistance, there is nothing I can do to help" correspond to higher perceived controllability. Several constructs relevant to health behavior change theories could not be included in analyses (e.g., perceived threat, perceived threat of action, environmental supports/obstacles) due to either insufficient items in the existing Gatekeeper Training Survey (Wyman et al., 2008) or poor inter-item consistency.

An adapted version of the Gatekeeper Training Survey, Practice Issues Scale (Wyman et al., 2008) was administered at follow-up to assess participants' self-reported behavior and skill utilization 6 to 9 months following ASIST training.

Table 2 Gatekeeper Beliefs and Suicide Prevention Behaviors Prior to and Following Participation in ASIST

	Pre-test α	Pretest M (SD)	Posttest M (SD)	Follow-up M (SD)	*t* (DF)	X^2 *(DF), N*	*p*
Belief							
Self-Efficacy	0.96	67.48 (23.61)	93.82 (17.68)	–	− 23.57 (400)	–	< 0.001
Cues to Action	0.91	15.39 (5.67)	22.16 (4.92)	–	− 21.3 (390)	–	< 0.001
Perceived Barriers to Action	0.68	19.11 (6.34)	14.01 (5.54)	–	16.52 (383)	–	< 0.001
Perceived Controllability	0.56	4.69 (2.17)	4.25 (2.05)	–	3.67 (387)	–	< 0.001
Behavior							
Identification*	–	1.04 (1.07)	–	1.43 (1.01)	–	98.37 (16), N = 247	< 0.001
Response*	0.94	1.23 (1.46)	–	1.62 (1.25)	–	1064 (16), N = 266	< 0.001
Referral*	0.81	1 (1.23)	–	1.76 (1.36)	− 5.53 (220)	–	< 0.001

*Data previously published in Ewell Foster et al., 2016. Identification is a 1-item variable, so alpha was not calculated

As detailed in Ewell Foster et al., 2016, three outcome variables were created assessing gatekeepers' 1) successful recognition of youths at-risk (Identification), 2) supportive actions towards the youth (Response), and 3) ability to connect the youth to professional resources and support (Referral).

Plan for Analyses

Belief scales were rationally developed based on health behavior change theories and empirically evaluated. Cronbach's alphas were calculated for each construct and indicate acceptable scale reliability for Self-Efficacy (0.96), Cues to Action (0.91), and Perceived Barriers to Action (0.68). Perceived Controllability received an alpha of 0.56, likely due to its two-item composition, but the scale was retained due to strong theoretical rationale and face validity of items.

Aim (1). Mean composite scores for each construct were calculated at pre- and posttest and, given equal variances in both samples, paired samples t-tests were conducted to assess changes in participants' beliefs following ASIST.

Aim (2). Hierarchical linear regression analyses were used to examine relations between posttest beliefs and self-reported GK suicide prevention behaviors 6–9 months post training. Three regressions were conducted; the beliefs were entered together on one step, predicting to one of three outcome variables (Identification, Response, and Referral) in order to examine the relative contributions of each belief to the desired GK behavior.

Results

Aim 1: Change in Specific Beliefs Following Participation in ASIST

All beliefs about suicidality changed significantly from pre- to posttest in directions that health behavior change theories suggest would be favorable to suicide prevention. Gatekeepers' ratings of their self-efficacy, cues to action, perceived barriers to action and perceived controllability demonstrated significant change from pre- to posttest. Of note, although statistically significant, there was only a slight improvement in perceived controllability. Pre- and posttest means, standard deviations, and t-tests of beliefs as well as GK suicide prevention behaviors (pretest and follow-up) are provided in Table 2.

Aim 2: Relation Between Beliefs and Gatekeeper Suicide Prevention Behaviors Post Training

Table 3 displays bivariate relationships among study variables. Hierarchical linear regressions were calculated to determine whether posttest beliefs predicted self-reported engagement in GK suicide prevention behaviors at follow-up. The Benjamini–Hochberg Procedure was utilized to control for family-wise error rate. As depicted in Table 3, there were significant bivariate relationships among all beliefs as well as between all beliefs and two of the three dependent variables (Response and Referral). Identification behaviors were only related to controllability beliefs in the bivariate analysis. As depicted in Table 4, with all beliefs in the identification model ($R^2 = 0.05$, F(4,250) = 3.01, $p = 0.019$), both Perceived Controllability ($\beta = 0.19$, $p = 0.005$) and Perceived Barriers to Action ($\beta = -0.15$, $p = 0.038$) predicted numbers of youth identified as at risk for suicide. Neither Self-Efficacy ($\beta = -0.19$, $p = 0.084$) nor Cues to Action ($\beta = 0.18$, $p = 0.086$) added significantly to the overall model. With respect to response behaviors, the overall model was significant with all beliefs included ($R^2 = 0.13$, F(4,237) = 8.74, $p < 0.001$); only Perceived Barriers to Action was significant ($\beta = -0.28$, $p < 0.001$) in the head to head comparison. Finally, with respect to referral behaviors, the overall model was again significant ($R^2 = 0.09$, F(4,230) = 5.60, $p < 0.001$) with a similar finding that only Perceived Barriers to Action ($\beta = -0.19$, $p = 0.008$) maintained itself as a significant predictor of behavior with all other beliefs in the model.

Table 3 Bivariate Correlations between Posttest Beliefs and Gatekeeper Suicide Prevention Behaviors at Follow-up

	1	2	3	4	5	6	7
1. Self-Efficacy	–						
2. Cues to Action	0.82***	–					
3. Perceived Barriers to Action	− 0.32***	− 0.24***	–				
4. Perceived Controllability	− 0.30***	− 0.29***	0.38***	–			
5. Identification	− 0.01	0.02	− 0.04	0.15*	–		
6. Response	0.27***	0.20**	− 0.31***	− 0.07	0.38***	–	
7. Referral	0.26***	0.15*	− 0.22***	− 0.03	0.43***	0.78***	–

*$p < .05$ two-tailed, **$p < .01$ two-tailed, ***$p < .001$, two-tailed

Table 4 Regression Results: Posttest Beliefs and Self-Reported Engagement in Gatekeeper Suicide Prevention Behaviors at Follow-up

	B	SE(B)	β	R^2
Identification				
				0.05*
Self-Efficacy	− 0.02	0.01	− 0.19	
Cues to Action	0.06	0.03	0.18	
Perceived Barriers to Action	− 0.04	0.02	− 0.15*	
Perceived Controllability	− 0.16	0.05	0.19**	
Response				
				0.13***
Self-Efficacy	0.01	0.01	0.115	
Cues to Action	0.01	0.02	0.07	
Perceived Barriers to Action	− 0.05	0.01	− 0.28***	
Perceived Controllability	0.04	0.03	0.07	
Referral				
				0.09***
Self-Efficacy	0.01	0.01	0.21	
Cues to Action	− 0.01	0.02	− 0.04	
Perceived Barriers to Action	− 0.03	0.012	− 0.19**	
Perceived Controllability	0.03	0.03	0.07	

R^2 = Adjusted R^2

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Discussion

Using three time points and a naturalistic evaluation design, this study examined changes in participant beliefs and relations between post training beliefs and subsequent GK suicide prevention behaviors. Using a commonly used gatekeeper evaluation survey (Wyman et al., 2008), four belief scales (Self-Efficacy, Cues to Action, Barriers to Action, and Perceived Controllability) were constructed to reflect key concepts of health behavior change theories. All scales demonstrated significant change from pre to post training in directions theoretically associated with suicide prevention behaviors—increased self-efficacy for suicide prevention, increased perceived knowledge and awareness regarding warning signs and risk factors (cues to action), reductions in perceived barriers to helping suicidal individuals (perceived barriers to action), and increased perceptions of the controllability of suicide (perceived controllability). This finding is a replication of previous studies that demonstrate GKT increases knowledge and improves attitudes and confidence regarding suicide prevention (Chagnon et al., 2007; Keller et al., 2009; Wyman et al., 2008), and extends these findings by employing health behavior change theories to further specify and define these constructs.

A second focus of this study was to examine the relationship between specific beliefs that support health behavior changes, measured at the conclusion of training, and subsequent GK suicide prevention behaviors. To control for bivariate relationships between beliefs, each linear regression model included all four beliefs measured at the conclusion of the 2-day training and assessed the extent to which beliefs predicted gatekeepers' self-reported engagement in suicide prevention behaviors 6–9 months later, including the identification of, response to, and referral of high risk youth to helping professionals. All three models were significant, with Perceived Barriers to Action the only significant independent predictor of all three GK behaviors. This finding points to the need for GKT curricula to elicit and refute beliefs that gatekeepers may hold regarding barriers to their own suicide prevention behaviors. Our findings suggest that this particular belief may be a critical mechanism of action that may impact a constellation of GK behaviors over time. This finding is consistent with many trainings that work to dispel the common myth that asking about suicide is dangerous and can "put the idea into someone's head," but may also reflect the need for a systems approach that supports gatekeepers in the workplace by removing structural barriers to supporting someone at risk for suicide (e.g., time, protocols to guide GK actions, readily available referral resources, establishing a culture that suicide prevention is everyone's responsibility; Moore, Cigularov, Chen, Martinez, & Hindman, 2011). Within clinical care environments, assessing and reducing objective obstacles to being a suicide prevention gatekeeper may be an important prevention strategy.

Perceived controllability beliefs were also related to identification behaviors but not to response or referral behaviors, extending previous research that suggests perceived behavioral control impacts intentions to intervene (Kuhlman et al., 2017, 2021). A surprising result was that self-efficacy was not significantly related to any of the GK behaviors measured at follow-up when examined head to head with other beliefs. This finding is unexpected given the many studies that have demonstrated the influence of self-efficacy beliefs on GK behavioral intentions (e.g., Kuhlman et al., 2017) as well as a range of different behaviors (e.g., Komarraju & Nadler, 2013). It will be important to continue to examine the stability of these findings using enhanced measures, different samples, and different GKT curricula.

Strengths of the present study include (1) a large community sample differing in age, gender, race, ethnicity and occupation; (2) longitudinal follow-up of GK behaviors; and (3) the use of theoretically based, psychometrically sound measures. Additionally, ASIST is a time intensive and clinically oriented evidence-based training that provides a high dose of skills training, which is likely related to the demonstrable improvements over time in participant GK behaviors (Ewell Foster et al., 2016). Study limitations include a predominantly white and female sample, lack of a control group, reliance on an existing self-report measure and the

fact that participants were a self-selected sample of committed individuals willing and able to devote two full days to training. The extent to which our findings might generalize to those mandated to participate in training or to briefer GKT is not yet known. In addition, differences in participant occupational roles and prior suicide prevention training experience were not examined in the current study, and represent an important area for future research. Approximately 17% of the sample reported having had at least 6 hours of suicide prevention training in the past- suggesting that ASIST may have served as a booser or continuing education for some, while serving as a new training experience for others. The value of booster sessions (Holmes et al., 2021) as well as experiential learning and practice (Kuhlman et al., 2021) to support continued use of skills is an important consideration for future study.

ASIST, as one of the longest available GKT programs, is somewhat unique in its specific focus on participants' beliefs towards suicide and suicide prevention using personal reflection and group conversation. These teaching strategies encourage participants to consider how the personal beliefs of a gatekeeper might impact an interaction with a vulnerable person. More research is needed to determine whether this aspect of ASIST is a critical component that should be included in other gatekeeper trainings. Pretest data suggests that many participants began training with beliefs that were favorable to suicide prevention. Consequently, we observed a ceiling effect with certain beliefs, namely perceived controllability. Although we used a previously published gatekeeper training survey (Wyman et al., 2008), the alignment between this measure and theoretically specified possible mechanisms of action was not complete. As a result, we were only able to assess some of the constructs that health behavior change theories designate as drivers of behavior change. These constructs may be key ingredients or mechanisms of action for GKT curricula. Our measure of identification did not demonstrate the hypothesized relationships with beliefs (e.g., cues to action which we expected to be highly related to the behavior of identifying youth at risk), which may suggest the need to improve our measurement of these constructs. Additionally, beliefs were not reassessed at follow-up thus limiting our ability to examine the stability of beliefs overtime and their potential impact on GK behavior post training.

The goal of GKT is to create suicide safe communities where community members are able to identify people at risk, respond to them compassionately, and provide additional support. With millions of dollars spent on GKT in the United States each year, it is critical to elucidate which core concepts are most important to include in training programs and to develop agreed upon measures of them. By using health behavior change theories as a guide, we can identify and link specific beliefs to desirable gatekeeper behaviors. Future research should link such findings to the development of standardized measures of both GKT learning targets and outcomes, and use prospective mediational models to empirically establish linkages between specific belief changes and behavior changes. Such knowledge could facilitate strategic tailoring of targeted, shorter training programs for specific beliefs and behaviors. Investigating beliefs that promote sustained, long-term behavior change is also an important area of future research that is beyond the scope of our 6–9 month follow-up window.

In summary, this study applied health behavior change theories to the evaluation of a two day suicide prevention gatekeeper training attended by over 400 community members. Findings from our study suggest that following training, gatekeepers demonstrated changes in suicide prevention beliefs that are aligned with health behavior change theories, suggesting that ASIST is likely effective in altering theoretically important beliefs about suicide prevention. Although each belief measured in this study demonstrated bivariate relationships with GK behavioral outcomes, only perceived barriers to action was related to all 3 GK suicide prevention behaviors, suggesting that refuting gatekeeper perceptions about reasons not to intervene may be a particularly critical aspect of effective gatekeeper trainings.

Author Contributions PS and CEF contributed to the study conception and design. Material preparation, data collection and analysis were performed by AB and CM. The first draft of the manuscript was written by CM, KS, DM, SF, and CEF. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding This work was supported by the Substance Abuse and Mental Health Administration under Grant <5U79SM059190> .

Declarations

Conflicts of interest All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Institutional Review Board of the University of Michigan (Ethics approval number: HUM0035883).

Consent to Participate Informed consent was obtained from all individual participants included in the study.

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