

Implementation beyond the clinic: Community-driven utilization of research evidence from PC CARES, a suicide prevention program

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Abstract

While implementation and dissemination of research is a rapidly growing area, critical questions remain about how, why, and under what conditions everyday people integrate and utilize research evidence. This mixed-methods study investigates how participants of Promoting Community Conversations About Research to End Suicide (PC CARES) make sense of and use research evidence about suicide prevention in their own lives. PC CARES is a health intervention addressing the need for culturally responsive suicide prevention practices in rural Alaska through a series of community Learning Circles. We analyzed PC CARES transcripts and surveys for 376 participants aged 15+ across 10 Northwest Alaska Native villages. Quantitative analysis showed significant correlations between five utilization of research evidence (URE) factors and participants' intent to use research evidence from PC CARES Learning Circles. Key qualitative themes from Learning Circle transcripts expanded upon these URE constructs and included navigating discordant information, centering relationships, and Indigenous worldviews as key to interpreting research evidence. We integrate and organize our findings to inform two domains from the Consolidated Framework for Research Implementation: (1) intervention characteristics and (2) characteristics of individuals, with emphasis on findings most relevant for community settings where self-determined, evidence-informed action is especially important for addressing health inequities.

KEYWORDS

Alaska Native Health, community-based participatory research, diffusion of innovation, implementation science, suicide prevention, utilization of research evidence

Highlights

- Prioritizing local needs and contexts is key for implementing evidence-supported practices in community settings.
- There is limited research on how community-driven implementation may improve uptake and advance health equity.
- This study uses CFIR framework to assess community-driven utilization of research evidence in community settings.
- Quantitative data shows correlations between URE and participants' intentions to act on research evidence.
- Qualitative findings describe how participants make meaning and plan to use presented research evidence.

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INTRODUCTION

While implementation and dissemination of research is a rapidly growing area, critical questions remain about how community leaders and everyday people from marginalized groups and low-resource settings translate and utilize research evidence in ways that align with their beliefs, priorities, and constraints of their daily lives (Kothari & Armstrong, 2011; Wilson et al., 2010). Intervention research tends to build a comprehensive program, with an eye to internal validity and fidelity, under highly controlled and ideal settings (Glasgow et al., 2012). Interventions developed in this way may have clearly established efficacy, but frequently fail at the implementation and dissemination stages in community contexts. Although rigorous randomized controlled designs may offer insight into intervention effectiveness, they do not often measure practical implementation outcomes such as costs, acceptability, and feasibility, which are key factors for community leaders and other stakeholder groups when deciding whether an intervention is a good fit for their unique needs (Dearing, 2009). Thus, such interventions may never have their intended impact because their design focus precludes contextual understanding and practical information necessary for real-world implementation. It is a serious concern that very few evidence-supported practices are adopted and implemented in real-world settings after the conclusion of the research, even when efficacy findings are highly promising (Anderson, 2012; Maciolek, 2015).

There has been a lack of attention to how, why, and under what conditions people in community settings, outside highly structured organizational contexts (e.g., healthcare systems, clinic networks, education institutions), learn about, interpret, and utilize research evidence, particularly when scientific information can strategically address significant health inequities. Most implementation research thus far has focused on practices and procedures enacted within formal institutions, and investigations of the use of research evidence (URE) have mostly considered prescribed behavior changes and tools to assist with routine decisions in clinical environments. More recent URE work investigates the decision-making processes of individuals such as health system managers and policymakers when integrating new research-based knowledge and approaches into their professional practice (Maciolek, 2015; Wilson et al., 2010). This line of research begins to delineate the complex judgements necessary for implementing evidence-supported practices outside structured clinical settings and highlights the importance of grounding research in the realities and priorities of target communities. Understanding these unique implementation factors is critical for introducing evidence-supported practices to stakeholders in community settings.

The consolidated framework for implementation research

The Consolidated Framework for Implementation Research (CFIR) synthesizes and categorizes a comprehensive set of

documented constructs related to implementation into five domains (Damschroder et al., 2009). CFIR provides a scaffolding for identifying and understanding factors influencing implementation and has utility for advancing our understanding of implementation efforts in under-resourced community settings. CFIR's framework supports the consistent use of constructs for systematic analysis and organization of findings and can be meaningfully applied across a variety of diverse and complex settings (Ilott et al., 2013).

CFIR's five domains include: (1) the process of implementation, (2) the characteristics of individuals involved, (3) intervention characteristics, (4) the inner setting, and (5) the outer setting. We use the CFIR as an organizing framework with a focus on the two domains most central to questions of how everyday people in community settings outside highly structured organizational contexts (e.g., healthcare systems, clinic networks, education institutions) integrate and make choices about using information from research evidence to take action for suicide prevention in their daily lives: (1) *characteristics of individuals involved* in intervention implementation, which includes their knowledge and beliefs; self-efficacy; stage of change; identification with the organization; and other personal attributes and (2) *intervention characteristics*, which includes intervention source, quality, and strength; relative advantage; adaptability; trialability; and complexity. In this study, we created quantitative measures of URE based on five constructs from Rogers' theories on the diffusion of innovation. Rogers' work suggests that new ideas which are perceived as having greater: (1) relative advantage, (2) compatibility, (3) trialability, (4) observability, and less (5) complexity will be adopted more rapidly than others (Rogers, 2003). Figure 1, a schematic model of our convergent mixed methods design, shows how the CFIR domains and URE constructs from Rogers' theories are used to integrate our quantitative and qualitative data.

Promoting community conversations about research to end Indigenous youth suicide

This study examines the utilization of research evidence (URE) and its impact on subsequent actions among community members participating in Promoting Community Conversation About Research to End Indigenous Youth Suicide (PC CARES). PC CARES was developed with Alaska Native (AN) communities to support youth suicide prevention. Suicide is the second leading cause of death for ANs aged 15–24, and suicide rates among American Indian and AN adolescents are the highest of any US racial/ethnic group (LeMaster et al., 2004; Wexler et al., 2008). In rural AN communities, suicide rates are up to 18 times higher for AN youth aged 15–19 compared to all American youth (124 vs. 6.9 per 100,000; Wexler et al., 2012). Successful implementation of effective suicide prevention is critical as Indigenous youth suicide remains one of the largest health disparities, despite substantial

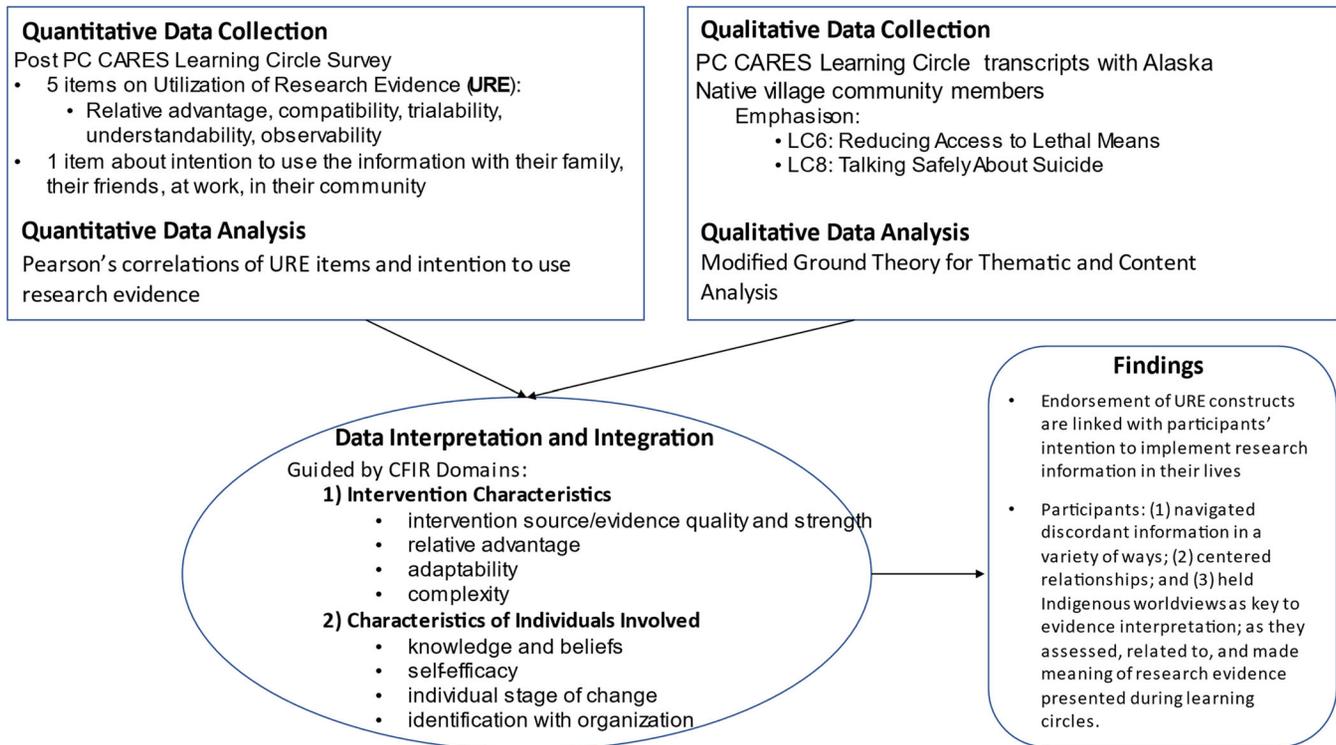


FIGURE 1 Schematic of convergent mixed methods design

clinical and research efforts and dramatic growth in the fields of suicidology and prevention science (Fraser et al., 2015). One reason that research evidence has not led to reduction in suicide rates among Indigenous youth is a pervasive disconnect between existing suicide research evidence and its local and practical relevance (Pufall et al., 2011; Wexler & Gone, 2012).

PC CARES is a novel community-mobilization approach to suicide prevention that was codeveloped by academic researchers and AN community members and leaders to prioritize alignment and integration between local ways of knowing and usable research evidence related to suicide prevention (Wexler et al., 2016). In this study, PC CARES was delivered through a series of nine "Learning Circles," (LCs) in which trained local facilitators lead discussions with community members. Focused on suicide prevention research from universal, selective and indicated levels, facilitators present "what we know" (bite-sized pieces of research evidence in 15 min or less), inviting participants to spend most of the time talking about "what we think" to reflect on its local relevance, and exploring "what we want to do," to apply the information to their lives, jobs, and communities (Trout et al., 2018). In this way, PC CARES is nonprescriptive. The collective learning process is intended to spark locally driven application of research evidence by family members, "layperson" community members, paraprofessionals, and professionals, where end users themselves determine how best to utilize the new information across

informal and formal channels within their particular community contexts. For more information on PC CARES, its decolonial framework, theoretical foundations, and pilot outcomes, see Trout et al. (2018) and Wexler et al. (2016, 2017, 2019).

PC CARES was piloted in 10 rural AN villages between 2015 and 2017. As part of our pilot work, we assessed URE factors by employing measures from Rogers' Diffusion of Innovation model (Rogers, 2003).

This study seeks to understand how everyday people make sense of research evidence and make choices about applying it to their daily lives. The pedagogy of PC CARES builds on participants' knowledge, and thus supports self-determined actions that make sense given a person's social role, context, and relationships. Given the variety of possible actions across multiple community levels, the behavioral outcomes of PC CARES present a unique opportunity to investigate how research evidence is interpreted and used (or not) by laypersons. Studying how people take self-directed action presents unique challenges because there are no explicitly prescribed or recommended behaviors to evaluate. By quantitatively and qualitatively analyzing how participants related to and made sense of presented research evidence, we can begin to understand what implementation factors within the CFIR domains of "characteristics of individuals involved, and "intervention characteristics" are most salient and relevant when designing interventions for community-based interventions in marginalized rural community settings.

METHODS

This study uses a convergent mixed-methods design to explore how everyday people put research information from PC CARES into action. Data include participant surveys and LC transcripts from PC CARES pilot research with 10 participating village communities (Wexler et al., 2019). Quantitative surveys measured participants' perceptions of five constructs from Rogers' diffusion of innovation and their intentions to act on suicide prevention information. Qualitatively, LC transcripts were analyzed to identify key themes related to the process by which participants made meaning of and interpreted each evidence-supported topic. We integrated quantitative and qualitative data to explore how PC CARES participants engaged with research evidence as they determined whether and how to utilize new research information in their own lives.

Participants and recruitment

PC CARES facilitators are local community behavioral health workers and leaders who self-selected to facilitate community-based suicide prevention LCs. They were primarily responsible for recruiting LC participants in

their own communities. Anyone in the community was welcomed and encouraged to attend. Recruitment strategies included flyers, word of mouth invitations, and local radio announcements, with facilitators adjusting recruitment strategies according to each community's norms. Facilitators followed PC CARES's aims to intentionally build a "community of practice" by intentionally including major village organizations and inviting various sectors, both formal (e.g., schools, churches, tribal organizations) and informal (e.g., parents, Elders) to LCs. All participants provided informed consent before completion of surveys or audio recordings. This study was reviewed and approved by the University of Massachusetts IRB and Maniilaq Association's Board of Directors.

Quantitative methods

URE constructs were quantitatively assessed via participants' reported prevention behaviors and intention to act, as well as their responses to five constructs of URE posited by Rogers' Diffusion model. These URE constructs are: (1) *relative advantage* of new ideas when compared to original ones; (2) *compatibility* of the new information with existing community assumptions and values; (3) *trialability*: ideas

TABLE 1 Rogers' diffusion of innovation constructs and corresponding survey questions

Construct	Pre/LC1, LC5, LC9, follow-up	LC2, LC3, LC4, LC6, LC7, LC8
Relative advantage	Q34. PC Cares opened my mind to new ideas for prevention	–None–
	Q35. Through PC CARES I have more ways to prevent suicide	
	Q44. I have more tools to promote wellness because I came to PC Cares	
Compatibility	Q21. The information shared today fits with what I know	Q21. The information shared today fits with what I know
	Q36. The information shared in this session seems right to me	
Trialability	Q25. After the is learning circle, I can think of at least one thing I can do right away for prevention	Q25. After the is learning circle, I can think of at least one thing I can do right away for prevention
	Q38. I see a way that I can use the information IO learned today to make a positive change	
	Q42. I plan to use some of what I learned during PC CARES	
Understandability	Q26. The information we talked about today was easy to understand.	Q26. The information we talked about today was easy to understand.
	Q33. I learned helpful information in PC CARES.	
	Q43. The information shared today makes sense to me	
Observability	Q20. This learning circle gave me clear ideas for how I can work to prevent suicide and promote wellness	Q20. This learning circle gave me clear ideas for how I can work to prevent suicide and promote wellness
	Q39. PC CARES gave me clear ideas for how I can work to prevent suicide in my family	
	Q41. PC CARES gave me clear ideas for how I can work to prevent suicide in my community	
Overall URE	Mean of above 5 constructs	Mean of above (Q20, 21, 25, 26)

Abbreviations: PC CARES, Promoting Community Conversations About Research to End Suicide; URE, utilization of research evidence.

be tried on a limited basis; (4) *understandability* of new ideas; and (5) *observability* of ideas to support continued use. See Table 1 for a catalog of survey items for each construct. All survey items were measured on a 5-point Likert scale that ranged from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). One item asked participants to specify their intention to use the information with their family, their friends, at work, in their community, or that they were unsure how to use the information, choosing all options that applied. This question was coded as a binary variable (“yes” if the participant answered “yes” to any of the “plan to use” options and “no” if the participant did not indicate any of the options or indicated they were unsure how to use the information).

Adult participants completed a survey at the end of each LC they attended. These surveys tracked if and how participants intended to utilize the presented research evidence in their own lives. After LCs 1, 5, and 9, and at follow-up (three months after all LCs), surveys containing 28 items (including three items for each URE construct) were administered. To reduce survey fatigue, shorter surveys with 11 items (including 1 item for each URE construct) were administered after all other LCs. Timing for full and truncated surveys and their items are presented in Table 1.

Descriptive statistics were calculated for each Rogers' Diffusion URE construct as well as for the summed score of the five items measuring Rogers' URE constructs. An overall URE score for each LC was calculated as the mean score of all measures (15 items for the longer survey, 4 items for the truncated survey) relating to the five Rogers' Diffusion constructs (see Table 1).

Pearson's χ^2 test of correlation was used to assess the relationship between participants' overall URE scores with participants' reported plan to use the information for each of the nine LCs and at 3-month follow-up. We also calculated correlations between each individual URE construct and intention to use research information after LC1, and again at 3-month follow-up. For all tests, a Type I error rate of $\alpha = .05$ was established a priori (significance = $p < .05$).

Qualitative methods

Before beginning each LC, facilitators asked participants for permission to audio record. If any participant did not wish to be recorded, the LC was not audio recorded. If everyone agreed, the session was audio recorded. All audio recordings were transcribed verbatim. Fifty-two of 64 LCs (81%) conducted as part of the pilot study were recorded and included in the analysis.

We employed modified grounded theory and thematic analysis (Braun & Clarke, 2006; Crowe et al., 2015) to analyze transcripts from the LCs, with specific attention to exploring participants' reactions and plans to use presented research evidence. Identifying and understanding the process of negotiations participants

underwent to make meaning and understand the relevance of scientific knowledge highlights important considerations for practitioners invested in translating research to practice in community settings. The lead author (White) independently coded a subset of transcripts related to LC6: lethal means restriction and LC8: talking safely about suicide after an attempt for in vivo and axial codes, and then iteratively discussed and developed these codes with the second author (Wexler). Core codes were then presented and discussed with coauthors, community members, and local facilitators closely involved with PC CARES for further refinement, incorporation with quantitative findings, and application to CFIR domains of focus.

Assessing fidelity and accuracy

To ensure that research evidence was being presented consistently across LCs, verbatim transcriptions of LCs were evaluated for fidelity and accuracy. Two independent raters with thorough knowledge of PC CARES coded LC transcripts for fidelity (how closely each facilitator followed the lessons outlined in the Facilitator Guide) and accuracy (how accurately the information from each module was presented by the facilitator and interpreted by participants). Interrater reliability was 78%. Final scores for fidelity and accuracy were the average of the two rater scores. Research evidence was presented accurately about 80% of the time. Important to this study, raters noted that in the remaining discussions, accuracy was lost not because the research evidence was misrepresented or inaccurately explained, but because the LC discussions drifted to *seemingly* unrelated topics with insufficient direct discussion or explanation of the intended topic to ensure accurate understanding of the information being presented. A detailed explanation of the scoring methods and results is provided in Wexler et al. (2019).

RESULTS

Quantitative results

Three hundred seventy-six individuals aged 18 and older from Northwest Alaska who participated in the PC CARES intervention completed at least one survey. As shown in Table 2, attendance at LCs and subsequent survey completion decreased over time, with 144 survey respondents for LC1, and only 15 respondents at LC9. This was due to: (a) some communities only completing the first few LCs and not holding LC9 and (b) among communities who completed all LCs, the number of attendees decreased over time, with mean LC attendance of 7.73.

There were significant correlations between URE scores and participants' plans to use information presented in the PC CARES intervention for LC1, $r(140) = .34, p < .01$; LC2, $r(56) = .34, p = .01$; LC6, $r(18) = .47, p = .047$; and at

TABLE 2 Correlation between URE and plans to use information learned by the learning circle

	Learning circle topic	N	Correlation between URE and plans to use info	p Value
LC1	Historical Trauma and Ongoing Colonization	144	0.33	.001***
LC2	Role of Adults in Reducing Youth Suicide	61	0.32	.017*
LC3	Local Seasonality of Suicide	52	0.15	.283
LC4	Community Protective Factors	36	0.11	.520
LC5	Listening Well as Supportive Counseling for Prevention	34	0.01	.937
LC6	Reducing Access to Lethal Means	18	0.47	.047*
LC7	Support After a Suicide Attempt	17	0.13	.634
LC8	Postvention: Talking Safely About Suicide	32	-0.08	.664
LC9	Overview of All Sessions and Steps Forward	15	0.04	.870
Follow-up	(3 months after all learning circles were complete)	102	0.35	.001***

* $p < .05$; *** $p < .001$.

		Learning circle 1 ($n = 144$)	Follow-up ($n = 102$)
Relative Advantage	Corr. with Plans to use info (y/n)	0.28	0.35
	p Value	0.0004***	0.0003***
Compatibility	Corr. with Plans to use info (y/n)	0.25	0.31
	p Value	0.0028**	0.0016**
Triability	Corr. with Plans to use info (y/n)	0.39	0.33
	p Value	0***	0.0011**
Understandability	Corr. with Plans to use info (y/n)	0.33	0.28
	p Value	0.0001***	0.0044**
Observability	Corr. with Plans to use info (y/n)	0.27	0.34
	p Value	0.0015**	0.0005***
Overall URE	Corr. with Plans to use info (y/n)	0.33	0.35
	p Value	0.0001***	0.0004***

** $p < .01$; *** $p < .001$.**TABLE 3** Correlation between participant URE scores and participant plans to use the information learned by diffusion characteristic

follow-up, $r(99) = .35$, $p < .01$. Table 2 presents correlation statistics for each LC.

Significant positive correlations were observed across all URE constructs and participants' plans to use the information presented in PC CARES after LC1 and at the 3-month follow-up (see Table 3). In general, participants' agreement with items from each URE construct positively related to their intention to utilize the research evidence presented. While overall URE correlations with the intention to act varied by LC, overall measures at LC1 and follow-up (see Table 3) show that each URE construct was similarly important in its relationship to participants'

intention to use the information they learned through PC CARES. In other words, when these URE factors were endorsed, participants were more likely to indicate plans to use suicide information from across PC CARES LCs in their daily lives.

Qualitative results

Analysis of transcripts from LCs revealed three core codes that represent important considerations for community-driven implementation of research evidence: (1) navigating

discordant information, (2) relationship centering, and (3) Indigenous worldviews as key to evidence interpretation.

Navigating discordant information

Our analysis clearly showed that participants sometimes encountered discordant information during LCs. This core code focuses on the ways in which participants made sense of discordant information. When navigating discordant information, participants sometimes expressed skepticism, reinterpreted the presented research evidence to align with Indigenous values, priorities, and local knowledge of “what works” in their own contexts, or used the LC time to discuss other proximally related local issues.

Making sense within and between people

Participants navigated research evidence both internally and interpersonally. One way that participants expressed internal negotiation was through repetition of information they had just been introduced to through the LCs. For example, in LC 8, which focused on talking safely about suicide after an attempt, one participant responded to the research evidence by sharing: “...It made people more at risk after seeing where they talk about the person who passed in that way. It might make grieving people want to hurt themselves too. Some words, I guess, are more sensitive than others. People take it differently.”

Interpersonal navigation of information presented in LCs ranged from short personal statements within a group discussion to asking questions about an interpretation or comment someone else just made: “Do you think it [the reaction you are experiencing from others] is because of the label [vocation in mental health] of what you do?” and repeating back information another person has just shared: “But I am hearing her say...[restates someone's previous comment]....” Often, participants made brief contributions, each building dynamically off of others' statements. In this way, conversation arcs were built by many participants sharing small pieces and coming to a group consensus or takeaway related to the research evidence presented.

Expressing skepticism

Participants expressed skepticism toward some of the presented research evidence. Skepticism was most commonly shared after the “what we know” section of each LC and was most often expressed about *who* had conducted the research and *where* the research had been done. One participant specifically explained, “My mind always goes like in lines of, ‘Who did this study and what geographic area was this done?’”

Participants also identified discrepancies between the research evidence presented in LCs and local contexts. For example, LC6 focused on lethal means restriction with a handout visually depicting common household objects and providing general examples of how to restrict access to potentially suicidal youth. One participant noted a disconnect, stating, “Except a bridge. We don't have a

bridge... We have open wilderness...” Another participant identified a disconnect when explaining, “A lot of people restrict access without going over gun safety.” Finally, a participant expressed skepticism by sharing, “I agree, but they are missing the boat [from the list]...”

Augmenting discussions with urgent “other” problems

We found that participants sometimes navigated discordant information by adjusting the focus of their discussion to include urgent community problems that seemed proximally related, or sometimes unrelated (from an outside researcher's positionality), to suicide prevention. This theme emerged more frequently in LCs focused on more difficult information, such as restricting lethal means (LC6) and postvention and talking safely about suicide after an attempt (LC8).

The focus on and linking of a different urgent problem happened several times during LC6, which focused on lethal means restriction and LC8, which focused on postvention and talking safely after a suicide. Examples of “other” urgent community problems that were raised ranged from small shifts in focus, such as brief discussions on the importance of teaching kids safe gun handling techniques to avoid accidental injury, or keeping medicines in properly labeled bottles to avoid accidental ingestion of the wrong medicine; to larger shifts including brainstorming how to respond to illegal alcohol consumption (i.e., bootlegging) in dry communities; and discussion of the lack of spaces for community events or prohibitive fees charged for groups to gather in community buildings.

When participants linked to urgent “other” problems, it appeared to be a process of the group connecting the new problem to the context of the LC. In one instance, during an LC on lethal means, a discussion was broadened when one participant asserted “...alcohol is a deadly means to some people,” given that many people are under the influence of substances during a suicide event. This expanded the conversation from restricting lethal means described in the LC: chiefly firearms and medications in the home, to the illegal consumption of alcohol in dry communities. Similarly, the lack of a community space was raised in response to ideas of offering suicide support by having someone available for struggling community members or to have regular events or meetings for local youth struggling with mental health. In both cases, expansion of the discussion to now include another urgent problem grew from critical contextualization of how to implement the evidence being shared in the PC CARES curriculum. Importantly, these enhanced discussions may appear from outside eyes to divert from the explicit focus of suicide, but it is clear that participants identify these issues as central to suicide prevention in their local communities.

Relationship centering

Another core code identified was the importance of centering relationship and participants' relationship-seeking throughout the LC. Participants prioritized getting

to know one another, building affinity, and generating ideas together through mutual consensus. As in many Indigenous cultures across the globe (Groves et al., 2020; Smith, 2013; Wilson, 2008), relationship building, and relationality is a key aspect of life in rural Alaskan villages, and this was highly evident during LCs. Furthermore, the pedagogical design of LCs augments relationship building toward suicide prevention. Discussions flowed beyond the specific LC as participants connected to one another, freely engaging a wider range of topics while also developing cohesiveness as a community group.

Active relationship building throughout LC

We found that LC participants actively sought to build relationships with one another. Participants introduced themselves and consistently affirmed and validated others throughout their discussions. Additionally, participants prioritized group consensus when generating ideas, which is consistent with “avoidance of conflict” as an often-stated Inupiaq value (Wexler, 2011). This collective process served to strengthen the group and, in turn, gave the LC topic a more familiar footing to participants. It was clear that participants valued working together and pursuing shared goals. This is exemplified by one participant who shared, “I pray for <town> in a special way tonight that the leaders be able to come to one voice, one understanding, and so we'll be able to move.”

Centering relationship in communicating suicide prevention evidence

Participants continually centered relationships when developing plans for suicide prevention. One participant explained, “I first think of all talking amongst ourselves. Having talking circles. Like family meetings about safety and wellbeing. Having different topics to talk about. It is important to check on neighbors and relatives, especially our Elders too, or young kids.” Another participant similarly noted relationships and building intergenerational connections, sharing:

I think in this community, too, we need more interaction with our young people. They used to be so busy long time ago when there was no electricity and no water and sewer. Now they have a lot of free time on their hands with no resources...no teen centers, that type of stuff. We need to focus on our young people and once we get their attention they'll be busy enough to where they won't have to think as much.

Relationships were conceptualized as important mechanisms for sharing research information throughout the local community. Across this analysis, central actions proposed to implement presented evidence revolved around community gatherings such as potlucks, games, and activities for families and young people, including gatherings for traditional dancing or teaching traditional

skills, (e.g., sewing, carving, beading). Participants viewed relationship building as openings to communicate important information about suicide risk reduction beyond the LCs. As one participant stated:

...we go have activity games out there with the children. Watch a whole bunch of people will start coming. We could start talking about it [suicide prevention information] right there. That's how it would work...even though we are there for a game night, it could be a way of educating them too. While you are playing games you can talk about things. A lot of kids'll talk about stuff when they're playing games.

Facilitators building relationship

Facilitators modeled active relationship building throughout LCs and centered relationship as they shared suicide prevention evidence. Facilitators often repeated back participants' statements, affirmed their conclusions, and encouraged participation, building positive regard. For example, in response to a participant who expressed they hadn't done much to prevent suicide in their community, one facilitator responded, “Sure just thinking about doing something—I know you've done things, [participant's name]. You don't give yourself credit. Even thinking about doing something, that's cool.”

In the case of one shy participant who didn't speak even when asked direct questions, the facilitator went out of the way to validate her contribution to the group by saying: “I appreciate you. She's always really helpful at the meetings. She makes sure everyone is signed in and get their tickets. One thing I gotta say is [participant] is a very loyal person. She's straight up about what she likes and she's doing it. I appreciate you [participant].”

Facilitators also emphasized consensus building when engaging in group work or pair work. They encouraged participants to come up with “one thing that y'all can agree on” and reminded groups to focus on consensus, for example, asking them to discuss and identify as a group “one reaction [written] in big letters.”

Indigenous worldviews as key to evidence interpretation

LC participants often called for continuity with Indigenous or local approaches to suicide prevention and for focus on community wellbeing as a whole. Participants' suggestions prioritized family and household leaders' decision-making, connection with neighbors and community relatives, and generally holistic approaches to interpreting PC CARES information or putting it into action. One participant explained:

Parents are the first teachers. Everything should be taught by role models, grandparents,

aunts, uncles. What is important to me is having family meetings, talking about safety, health, wellbeing. It is always good to have close connection with your family because I think everything starts at home. From there, once things are good at home, you are ok and it will be ok outside your house. That is how I think and how I see. I think everything pretty much starts at home.

As participants took part in PC CARES, they engaged in a dynamic process of matching or contrasting Indigenous worldviews iteratively throughout each LC, inextricably linking Indigenous approaches with PC CARES's information, for example, one participant explained, "This question makes me think of saying: 'It takes a whole village to raise a child.' And they aren't only kids. We should be able to look out for our relatives and neighbors in a small community. To look out for each other."

When engaging in the process of integrating their own worldviews and presented research evidence, one participant shared:

My dad is real particular. He won't put his guns on the ground. Even butchering caribou, he won't put his knife on the ground. He will put it on a big rock or something. I guess it's how he try to take care of his things. It is a good way to think about those certain things you have in the house too. What you think is the best way to store them. Put them where they are not visible all the time, too.

These quotes demonstrate the ways in which participants link traditional community structures (family, community relations) and protocols (taking special care of your tools) directly to evidence-supported information, weaving them together into interpretations of recommendations that fit community approaches. This kind of meaning-making could be described as an indigenizing of the PC CARES information and exemplifies a vital crux of the theory on which the PC CARES approach is based.

We did not identify any direct or explicitly stated conflict between Indigenous worldviews and PC CARES research information in our thematic analysis. However, we did observe that participants sometimes put boundaries or qualifiers around *how* to carry out actions that use PC CARES information. For instance, in response to research evidence about lethal means restriction, one participant stated: "It is up to whoever is in charge of the guns in the household. A lot of them are hunters and want to teach their kids. It's pretty much up to each household when they think their kids are ready. They are the ones that need the hunters, but they have to wait until they are ready—the parents."

While this participant is not asserting that guns should *not* be put away according to PC CARES information, they are stating a cultural notion that parents are the

ultimate authority on when and how to handle guns—who should have access and who shouldn't—in their homes. At the same time, this assertion implies that it is parents' responsibility to thoughtfully balance suicide risk and usefulness of guns in their households in a way that teaches their children and prepares them to be hunters.

Although we did not find expressions of direct conflict between PC CARES information and traditional or Indigenous worldviews expressed, this does not mean that conflicts did not exist or were not perceived by PC CARES participants. It is possible that participants engaged in other mechanisms of navigation which were not observed or captured in audio recordings.

Integration of quantitative and qualitative results

The quantitative arm of this study homes in on five specific URE constructs important for diffusion of information (Rogers, 2003). Our findings reinforce existing research which establishes that these constructs can be important (Rogers, 2003), and expands upon this literature by highlighting that these five constructs are correlated with intentions to take action even when the information provided is not a specific behavioral directive (e.g., store all guns unloaded and in a safe), but instead a broader lesson on current research evidence (e.g., 10 min can save a life). Our quantitative findings highlight that these five established URE constructs are generalizable characteristics clearly important for a message to "land" with everyday people.

The qualitative arm of this study goes beyond the five Rogers' diffusion URE constructs to raise key issues specific to AN villagers, which directly influence utilization of information from the PC CARES intervention. For interventionists and implementation scientists, this depth of information about how participants grappled with presented research information, especially what information was considered important and prioritized by participants as they came to understand and make plans to use the information, is particularly useful. Our findings provide "real time" insights into community members' discussions that show how research is actively negotiated, the kinds of questions that emerge related to its authenticity and applicability, and its relevance to addressing issues and problems of concern in their community. Qualitative findings thus serve as a guide for interventionists and implementation scientists entering a new setting to inform the understanding of what priorities, protocols, and themes may come up as important during the implementation of programs in marginalized rural communities.

DISCUSSION

Our analysis of PC CARES participants' intention to utilize research evidence to prevent suicide in their communities revealed useful quantitative and qualitative

findings with important implications for the implementation and dissemination of evidence-supported interventions in real-world settings. Significant correlations were observed between participant's overall URE scores and intention to use research evidence presented in three LCs (1, 2, and 6), as well as at the 3-month follow-up. Intention to act was significantly correlated with scores for each individual URE construct at LC1 and follow-up. Qualitative findings showed the process by which participants navigate discordant information, make sense of information, express skepticism, and add critical contextualization of PC CARES information, sometimes expanding the conversation to include urgent other problems. Augmenting with other topics can be seen as an outcome of holistically processing information whereby meaning making is deeply contextual with connectors that might not always make sense to "outside" researchers. Additionally, these shifts may well serve to strengthen bonds among community members, an underlying goal for suicide prevention activities. While navigating information from the LCs, participants prioritized building relationships and often conceptualized relationships as an important mechanism for taking action and utilizing the research evidence presented. Additionally, we found that participants oriented Indigenous and local worldviews as key to deciphering the best ways to act on presented research evidence.

Taken altogether, our findings contribute importantly to considerations for implementation, especially for community-based interventions implemented in dynamic, complex social contexts. Given that members of the PC CARES team have been engaged in community-based participatory research (CBPR) research in this community over two decades, we have developed foundational relationships which facilitate honest conversations and invite self-determined action for suicide prevention. Thus, our results particularly speak to two domains of the CFIR: (1) characteristics of individuals involved and (2) intervention characteristics, which are especially relevant domains for understanding and planning community-based implementation.

Intervention characteristics

Intervention source/evidence quality and strength

A central characteristic of PC CARES is training local people to actively assess the source, quality, and strength of research evidence and accordingly, take action in their own communities. This emphasis on local vetting of intervention quality is one of the key reasons local leaders and other stakeholders supported its implementation. Qualitative findings show that participants commonly questioned and wanted to know from whom and where the presented research evidence came. When information did not easily fit into their understandings, participants grappled with

whether the evidence was relevant to their community and identified discrepancies.

Relative advantage of the intervention

Quantitative findings suggest correlations between each URE construct and intention to use research information. This relationship varied across LC topics, and qualitative findings offer insight into the process by which research evidence topics are taken up. Additionally, we found significant correlations between self-reported relative advantage of PC CARES overall, and intention to use research information at follow-up (see Table 3).

Intervention adaptability

Qualitative findings suggest LC participants were able to use the research evidence and adapt it to the needs of their local community to identify recommendations for suicide prevention efforts. Qualitative codes of *relationship centering* and *Indigenous worldviews as key to evidence interpretation* begin to outline some ways in which participants adapted PC CARES information by linking it with local structures and practices, integrating these two sources of knowledge for evidence-informed recommendations that fit community approaches.

Intervention complexity

The sharp decline in LC attendance over time suggests that perhaps there are too many PC CARES sessions (duration). Further, our qualitative findings indicate that participants may have felt more dissonance with research evidence presented in LC6 (lethal means restriction) and LC8 (postvention: talking safely about suicide after an attempt), which suggests certain topics may be disruptive to participants. It may also indicate that some topics require more groundwork connecting with other LC participants before moving into direct content discussions.

Characteristics of individuals involved

Knowledge and beliefs about the Intervention

PC CARES centers participants' perceptions about the intervention process via calls for participants to express "what we think" about the evidence presented at each LC. Quantitative results show participants' receptivity to the intervention based on high ratings of URE constructs. Qualitative results demonstrate how receptivity to evidence hinges explicitly on the integration with participant knowledge and beliefs for community-driven action.

Self-efficacy

In implementation science, self-efficacy is typically defined as an individual's belief in their own capabilities to execute specifically recommended actions (Damschroder et al., 2009). The pedagogy of PC CARES presents a unique opportunity to investigate what self-efficacy looks like as laypersons engage in an active process of incorporating research evidence to determine their own course of action. PC CARES shifts from an intervention model which prescribes specific actions to a model which facilitates participants' decisions of "what do we want to do" with research information, which transforms the role of self-efficacy from a question of "Can I do this action?" to one of "How can I use this information to take action?" Preliminary outcomes papers from PC CARES (Wexler et al., 2019) show that our approach seems to initiate and support additional prevention-oriented actions on the part of participants. The current study examines the processes by which participants consider and make practical sense of the research, including considerations of their own self-efficacy. Our qualitative findings deepened our understanding of how participants made decisions about using research information to take action without a prescriptive behavioral directive. Themes related to navigating discordant information and expanding to urgent "other" problems are particularly relevant to the concept of self-efficacy. For example, when presented with information that didn't match their local environment—such as information about installing railings on bridges in communities with no bridge—instead of determining a low ability to execute or use this information, participants were able to translate the information to similar hazards in their communities (open wilderness), and discussed relevant prevention actions which they did have self-efficacy to enact. Likewise, our qualitative findings related to participants augmenting with urgent "other" problems during LCs suggest that participants identified local issues or contextual factors which inhibited their ability to act on research evidence presented. For example, one urgent "other" problem brought up during LCs was the lack of community spaces to gather. This is an important contextual factor which may limit a participant's self-efficacy around suicide prevention actions that hinge on group gatherings and community events. Although this self-directed approach allows participants to generate ideas for which they feel high self-efficacy, the lack of prescribed outcomes can be difficult to measure and presents a challenge. Our quantitative findings highlight that Rogers' five URE constructs were positively correlated with participants' intentions to act, even though the information provided was not a specific behavioral directive. Collectively, these findings have high relevance for future intervention and implementation research which seeks to similarly transform participant considerations of self-efficacy.

Individual stage of change

While individual stages of change may increase variability in survey responses to URE constructs, where participants with higher levels of self-reported agreement with URE constructs have higher pre-existing readiness to take action, our qualitative findings demonstrate how participants who are all at different individual stages of change come together to make meaning of and decide together whether and how to use new information. Each LC participant's individual stage of change impacts how the group navigates the provided information as they make sense of it according to their own local knowledge, priorities, and worldviews.

Individual identification with organization

The importance of individual identification with organization or in this case, the intervention, is reflected through facilitator buy-in. As champions of the PC CARES intervention, facilitators recruit other community members to LCs and share research evidence from the PC CARES curriculum with a high level of fidelity and accuracy (80%). Further, qualitative findings demonstrate that facilitators emphasize and support relationship centering, building consensus, and validating participants' meaning making of evidence presented and its alignment with Indigenous worldviews.

Other personal attributes

Other personal attributes of LC participants that emerge from this analysis are their Indigenous worldviews and strong knowledge of, and identification with, local contexts. These worldviews and understandings allowed research evidence presented at LCs to be applied to local contexts in ways that are likely to result in feasible and acceptable suicide prevention efforts.

These two CFIR domains intersect throughout our analysis in important ways, supporting the integration of our quantitative and qualitative findings, as well as our understanding of strategies to promote URE in AN communities. In a 2012 systematic review of Knowledge Translation Strategies in Public Health, LaRocca et al. (2012) concluded that no singular implementation strategy has been shown to be effective in all contexts. Given this, it is impossible to draw conclusions about intervention and its implementation without considering the characteristics of both the intervention and of the participants, organizations, and settings involved, and how they intersect. Similarly, Palinkas et al. (2017) collected URE data from 151 directors and senior administrators of child welfare, mental health, and justice systems, finding that the vast majority of agencies stressed the importance of local and cultural contexts and that whether and how new

information gets utilized is contingent on local priorities, cultures and systems of meaning.

Therefore, studies focused on implementing research evidence beyond clinical settings require new approaches that are evidence-informed, as well as culturally responsive, flexible, and feasible. This may mean shifting priorities from conventional concepts of rigor such as validity, reliability, and generalizability toward a more nuanced understanding of what catalyzes the use of research evidence in real-world, community-based settings (Gitomer et al., 2017; Greenhalgh & Papoutsi, 2018). Utilizing respectful, CBPR approaches that invite people to consider their own knowledge and experiences in relation to the research evidence is one strategy to facilitate new understandings, and personal and collective determinations about how best to put that learning into action (Ramanadhan et al., 2018; Stover et al., 2020). Our findings begin to unpack some ways that people grapple with the complexities of suicide prevention information and provide insight into what it may look like to build prevention approaches informed by their particular local knowledge of what, how, and who will work rather than installing a uniform, top-down, or expert-driven approach. These considerations may also be relevant for the implementation of interventions across clinical and community domains which focus on improving health equity for oppressed and marginalized groups (Baumann & Cabassa, 2020; Snell-Rood et al., 2021; Woodward et al., 2019).

Limitations

Our results should be considered with several limitations in mind. First, our quantitative analysis relies on correlations between the URE constructs and survey items about intentions to act. Intentions are not always consistent with later actions, (Ajzen et al., 2018). However, it was not feasible or practical to extend our pilot study period over months or years to assess participants' actions. Furthermore, self-report of actions over long periods is also susceptible to recall bias (Coughlin, 1990). Through the integration of our quantitative and qualitative data, we gain an increased understanding of our findings and identified specific expectations for what participants planned to do with the PC CARES research information. It is not our claim that high scores on the URE survey items are absolutely required for participant action to occur. Rather, URE constructs may provide a proxy measure for observing building blocks required for implementation efforts to spur participant-driven action. To reduce survey fatigue, not all URE constructs were measured after each LC, this may have contributed to inconsistencies in URE to action correlations across timepoints. Lastly, variation in the number of participants at each LC, with some LC follow-up surveys having a small sample size, may limit the power of our quantitative analysis.

CONCLUSIONS

This study examines how rural AN PC CARES participants made sense of and decided whether and how to use research evidence presented in the intervention. The PC CARES intervention intentionally facilitated and encouraged open discussion of participants' meaning-making process after presenting research evidence about suicide prevention. Leveraging this unique approach to URE, our analysis illuminates how these important, often-private community deliberations occur.

In our survey data analysis, we found significant correlations between all measured URE constructs (relative advantage, compatibility, trialability, understandability, and observability) and participants' intention to use suicide prevention information presented in the LCs. This finding affirms that factors of diffusion are important for the uptake of research information among community leaders and everyday people in rural and marginalized communities, and shows a promising approach to evaluation for future development of community-based, nondirective interventions where the explicit assessment of whether a specific recommended action was executed is not a good fit. In PC CARES LCs, participants navigated discordant information by making sense within and between others, expressing skepticism, and augmenting the conversation with locally important additional information; centered relationships throughout their meaning making of research evidence and their planning to make use of evidence in their communities; and held Indigenous and local knowledge and practices as central to understanding how research evidence about suicide prevention could be used in their own lives. Taken altogether, these results show how community members integrate personal and local knowledge to inform their use of research evidence. Importantly, communities and their priorities and considerations are not stagnant—certainly, PC CARES LCs conducted during and in the post-COVID era would have new and different themes in response to incredibly different community dynamics and priorities. While this study offers a case example of how people in community contexts make meaning of research evidence and arrive at decisions about how to use it, this process is dynamic and changes in tandem with community and social-environmental change. Thus, we first recommend intentionally integrating principles of CBPR (Collins et al., 2018), and prioritizing community-led action when utilizing implementation research methods and frameworks in less structured (e.g., nonclinical) community settings. Second, we recommend incorporating more implementation approaches which facilitate self-determination and locally driven action to reduce disparities in intervention uptake and acceptability, increase community URE, and ultimately advance health equity.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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