



# Culturally-Relevant Online Education Improves Health Workers' Capacity and Intent to Address Cancer

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## Abstract

To address a desire for timely, medically-accurate cancer education in rural Alaska, ten culturally-relevant online learning modules were developed, implemented, and evaluated with, and for, Alaska's Community Health Aides/Practitioners (CHA/Ps). The project was guided by the framework of Community-Based Participatory Action Research, honored Indigenous Ways of Knowing, and was informed by Empowerment Theory. Each learner was invited to complete an end-of-module evaluation survey. The survey asked about changes in intent to share cancer information with patients as a result of the module. In 1 year, August 1, 2016–July 31, 2017, 459 surveys were completed by 79 CHA/Ps. CHA/Ps reported that, because of the modules, they felt more knowledgeable about cancer, and more comfortable, confident, and prepared to talk about cancer with their patients, families, and communities. All learners shared that because of the modules, they intended to talk with their patients more often about cancer screenings, tobacco cessation, physical activity, or nutrition. These findings suggest that the application of this collaboratively developed, culturally-relevant, health promotion intervention has supported increased CHA/P capacity and intent to interact with patients about cancer. In the words of a learner: "Doing all these courses makes me a ton times more comfortable in talking about cancer with anyone. I didn't know too much about it at first but now I know a whole lot. Thank you".

**Keywords** Community health workers · Online learning · Culture · Alaska Native · Health promotion · Community based participatory action research

## Background

Cancer is the leading cause of death among Alaska Native people, who are disproportionately impacted by cancer and cancer risk factors [1]. To address this inequity, this research project developed and implemented culturally-relevant online cancer education modules, and evaluated their impact on tribal health workers' capacity and intent to share cancer information and address cancer risk factors.

Between 2009 and 2013, the cancer mortality rate for Alaska Native people was 40% higher than U.S. Whites [1]. The leading causes of cancer incidence among Alaska Native people (lung, colorectal, and breast cancer) all have modifiable risk factors, which presents an opportunity for health promotion efforts to support reduced cancer risk [2].

Cancer risk factors disproportionately impact Alaska Native people: in 2010–2014, 36.4% of Alaska Native adults reported current smoking (compared with 18.3% of Alaska White adults and 19.0% of U.S. White adults) [3], 35.2% of Alaska Native adults reported heights and weights categorized as obese (compared to 26.9% of Alaska White adults and 26.4% of U.S. White adults) [4]. In 2009–2013, only 9.0% of Alaska Native adults reported eating at least 3 servings of vegetables and 2 servings of fruits each day, which, while similar to the Alaska White rate of 12.2%, leaves ample room for improvement [5]. Health promotion efforts have the potential to influence modifiable cancer risk factors among Alaska Native people, as the disparities are not intractable. The proportion of Alaska Native

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adults receiving colorectal and breast cancer screenings has recently attained parity with rates for both Alaska White adults and U.S. White adults, while cervical cancer screening rates for Alaska Native people are now only slightly lower than Alaska White women [6–8].

Alaska's Community Health Aides/Practitioners (CHA/Ps) are vital to promoting reductions in modifiable cancer risk factors. Alaska's CHA/Ps are tribal primary care providers in rural Alaska. CHA/Ps are recruited from the communities they serve, and work under the supervision and standing orders of senior medical providers. In rural Alaska, education about tobacco, weight management, physical activity, cancer screenings, and nutrition, is provided by CHA/Ps, who are often the only health care providers in their communities.

The Alaska Community Health Aide Program (CHAP) was developed in the 1960s, and remains a core component of Alaska's healthcare delivery system [9]. Alaska's CHA/Ps are trained to practice according to the guidelines of the Alaska Community Health Aide Manual (CHAM), which details protocols to evaluate patients and provide basic and emergency medical care. To become a Community Health Practitioner, individuals engage in four 3–4 week basic training sessions, then complete a clinical skills preceptorship and examination [9]. Out of the 588.5 h of basic training, only 2 h (.3% of the total training) are dedicated to information about cancer [9].

Due to this lack of information, and the large burden of cancer in their communities, Alaska's CHA/Ps have requested additional cancer education [10], resulting in the CHAP cancer education project team developing and instructing in-person cancer and wellness courses starting in 2001 [11]. However, the recent statewide financial crises, coupled with Alaska's large distances, expensive airfare, remote communities, and harsh weather patterns, restrict CHA/Ps ability to receive in-person education. Fortunately, increased access to high-speed Internet in rural Alaska has provided an opportunity for CHA/Ps to engage in cancer education without the cost or burden of leaving their communities [12, 13]. In response, the CHAP cancer education project team has developed 10 stand-alone culturally relevant online cancer education modules: cancer basics, cancer and our genes, nutrition and physical activity, tobacco, cancer treatments, cancer pain, grief and loss, colorectal cancer, men's health, and women and cancer. Modules were published online as they were developed between March 2015 and November 2016. The modules were designed to inform CHA/Ps about specific cancer information, to support learners to engage in cancer risk reduction behaviors, and to improve learners' capacity and intent to share cancer information with their patients, families, friends, and communities. This manuscript describes learners' self-reported changes as a result of participating in the modules; in cancer

knowledge; comfort, capacity, and preparation to talk about cancer; and in intent to engage with patients about cancer.

CHA/Ps are uniquely suited to support individual and community-level health behavior change due to their centrality in each community's health and wellness network. Working with CHA/Ps is conceptualized as disseminating information and empowerment through existing social networks to promote health behavior change. Counseling by healthcare professionals, such as Alaska's CHA/Ps, is a significant determinant of patient behavior, and has been found to have impacts on modifiable cancer risk factors. In a study of over 8000 patients, receiving an adequate explanation of the need for colorectal cancer screening from a healthcare professional was significantly correlated with patients receiving the screening [14]. A meta-analysis found that receiving advice from a healthcare professional about tobacco cessation increased the rate of patients who quit tobacco [15]. Further, a systematic review found a positive correlation between patients' physical activity and provider counseling about exercise [16]. The aim of shifting patient behaviors by improving CHA/P-patient education is consistent with the literature, which has documented that counseling by healthcare professionals is a significant determinant of patient behavior.

## Methods

### Theoretical Framework

The principles of Community-Based Participatory Action Research (CBPAR) guided the project, and evaluation was conducted in alignment with Empowerment Theory. CBPAR emphasizes a collaborative partnership between community members and academics/researchers, with action research focused on issues relevant to the community that realize social change to reduce inequities [17]. This framework guided the collaboration of the project team, CHA/Ps, and CHA/P supervisors and instructors. Ways of knowing that resonate with CHA/Ps have been incorporated into CHA/P cancer education since its inception [18, 19], with learning methods tailored to CHA/Ps' understandings, many of which echo Indigenous Ways of Knowing that emphasize relationships and affective domains [20, 21].

Extensive formative work was undertaken to explore how to realize culturally relevant ways of learning and knowing in an online format, with findings including; collaborative development, contextualizing learning, creating opportunities for connection, and delivering content in ways that resonate with learners, such as through stories, local information, and visuals. These findings were incorporated into module development. For example, a CHA/P created digital story is embedded in the module on nutrition and physical activity to

ground diet and exercise recommendations within a personal story of hunting, fishing, and gathering food as a connection to the land and cultural traditions.

Modules were evaluated in alignment with Empowerment Theory. Empowerment is both a natural extension of the ongoing CBPAR to promote cancer risk reduction behaviors with Alaska's CHA/Ps, and a foundation of CBPAR. A theoretical grounding of the CBPAR framework stems from Paulo Friere's Popular Education, which advocates for empowering education that leads to social transformation—an idea identified as an effective health education strategy [22]. Further, CBPAR theorists advocate that work with Indigenous communities acknowledge historical trauma and its impacts, and focus on self-determination and empowerment [23]. Health promotion with Indigenous communities may be more appropriate and effective when grounded in empowering approaches. Traditional food systems and cultural practices have been disrupted for many Indigenous communities, with resulting lifestyle shifts and historical trauma linked by some researchers to contemporary cancer disparities [24]. These guidelines are actualized in this work by focusing on cultural relevancy, cultural strength, and supporting community capacity. Linked to self-determination, empowerment is a participatory process that advances social justice and redistributes power to increase control and promote wellness through participant/academic collaboration [25].

Empowerment Theory articulates both the empowering processes outlined above, as well as empowering outcomes used to guide project evaluation [26]. The authors of Empowerment Theory acknowledge that universal measures would be inappropriate to articulate due to the diversity of populations and contexts in which Empowerment Theory can be applied. Instead, the theory identifies three underlying constructs of empowerment outcomes: intrapersonal (changes in the way individuals think of themselves), interactional (changes in understanding about a given concern), and behavioral (actions taken to directly influence outcomes) [26]. Evaluation measures for this project were developed to measure each of these three domains.

## Learners

The developed online cancer education was created with, and for, Alaska's CHA/Ps. However, no master contact email list for CHA/Ps currently exists, as each tribal health organization maintains and protects their CHA/Ps' information. Consequently, the project team reached out to CHA/Ps through known emails, previous in-person course participants, the CHAP Newsletter, the CHAP website, CHAP Directors, CHAP Training Center Coordinators, the CHAP Academic Liaison, and the Community Health Aide

Association President. All recipients were invited to share the information widely to reach additional learners.

## Curriculum

All ten modules were approved for continuing education and are available for free online. Each 2 h learning experience was designed to support CHA/Ps in their capacity as health-care providers and community members. To create each module, a project team member first drafted a storyboard in Microsoft Word that outlined content and indicated where visuals, storytelling, and interactivity should be included. Content experts, CHA/P collaborators, and members of the CHA/P community then reviewed the storyboard and offered suggestions. After incorporating suggestions, a project team member translated the storyboard into an online module using the software "Articulate Storyline." CHA/Ps, CHA/P instructors and directors, content experts, and the project team, then reviewed the drafted online module, and offered suggestions on module design, format, and content. Then the module was published online.

Each module was approved as Continuing Education (CE) by the CHAP certification board. CHA/Ps are required to complete CE to maintain their certification. CE includes any medically approved continuing education applicable to CHA/Ps' scope of work. Sixteen additional online learning options are available on the Alaska Native Tribal Health Consortium (ANTHC) Distance Learning Network, but do not include other units focused on cancer. The cancer education modules are hosted at <https://anthc.remote-learner.net> on the ANTHC Distance Learning Network. Consistent with the CBPAR principles of co-learning and collaborative work [27], learners were asked for continued input on end-of-module evaluations, with iterative adjustments made to the modules in response to learner comments.

## Measures

Learners completed end-of-module evaluation surveys that included questions on changes in learners' capacity and intent to both share information about cancer, and reduce cancer risk factors. Prospective learners were required to create an account on the ANTHC Distance Learning Network before accessing the online education. This process assigned a user ID to each learner, which enabled the project team to identify unique learners. After completing each module, learners were required to pass a knowledge-based quiz and submit an end-of-module evaluation survey before receiving Continuing Education. The survey was developed collaboratively by CHA/Ps and the project team to better understand learners, their perceptions of the modules, and to measure empowerment outcome constructs. Prompts included questions on demographic information,

respondents' likes, critiques, and suggestions, changes in capacity to engage with patients on cancer as a result of the modules, and learners' intent to reduce their own cancer risk. Outcomes measure the Empowerment Theory constructs of "intrapersonal" (through asking about self-reported changes in the ways learners think of their own comfort, confidence, and preparation to engage with others about cancer), "interactional" (through questions about learners' shifts in knowledge about cancer), and "behavioral" (through prompts on learners' intent to take action to influence modifiable cancer risk behaviors among themselves and their patients). End-of-module evaluation surveys were downloaded from the network then cleaned and summarized in Microsoft Excel 2016. Qualitative responses were open coded in Microsoft Excel, with common themes identified by frequency of occurrence. A summary of these themes was then shared with the project team and partners for review and interpretation.

## Results

### Learners

The Director of CHAP Rural Health Services identified 379 CHA/Ps practicing in Alaska as of May 2016 (personal communication). Despite the lack of a master CHA/P contact list, demographic information on Alaska's CHA/Ps is maintained. While the actual demographics of CHA/Ps may have shifted over the timeframe of this study, these numbers allow us to estimate the demographics of the CHA/P population.

A total of 79 unique CHA/Ps completed at least one evaluation survey between August 1, 2016 and July 31, 2017, an estimated 21% of all practicing CHA/Ps. A total of 513 evaluation surveys were completed in this time-period, with 89% completed by CHA/Ps (459 surveys), and 11% completed by other community health workers, healthcare professionals, and community members. The number of learners engaging in the modules continues to rise, with 6.5 average additional new learners each month. About a quarter (24%) of CHA/Ps who submit an evaluation completed one module, while about a third (38%) completed all ten. CHA/P learner demographics, as compared with the CHA/P population as of May 2016, and education information is from a previously conducted survey of 402 CHA/Ps [18], are summarized in Table 1.

Learner demographics are similar to the CHA/P population, although a higher percentage of learners were Community Health Practitioners (CHPs). CHPs have completed CHAP Basic Training and are more advanced than Community Health Aides, and may also potentially have more time and need for Continuing Education. In addition, the module evaluations allowed learners to check multiple races/ethnicities, while the population estimate limited CHA/Ps to one

**Table 1** Demographic Characteristics of Unique CHA/P Learners and Estimated CHA/P Population

	Unique CHA/P learners N (%)	Total CHA/P population in May 2016 N (%)
Total	79 (100%)	379 (100%)
Gender		
Female	67 (85%)	324 (85%)
Male	12 (15%)	55 (15%)
Ethnicity		
Alaska Native	67 (85%)	303 (80%)
Caucasian	10 (13%)	30 (8%)
Other	<sup>a</sup>	46 (12%)
Age		
20–29	21 (27%)	101 (27%)
30–39	23 (29%)	116 (31%)
40–49	15 (19%)	71 (19%)
50–59	13 (16%)	68 (18%)
60+	6 (8%)	23 (6%)
Education		
Some high school	<sup>a</sup>	24/402 (6%)
High school/GED	34 (43%)	187/402 (47%)
Some college	38 (48%)	146/402 (36%)
Associate degree	6 (8%)	30/402 (7%)
Bachelor's degree	<sup>a</sup>	12/402 (3%)
Employment		
Community health aide	32 (41%)	194 (51%)
Community health practitioner	47 (59%)	185 (49%)

<sup>a</sup>Number of respondents smaller than 5. Actual number redacted to protect the identity of respondents

race/ethnicity. This may contribute to the higher percentage of learners identifying as (also) Caucasian or Alaska Native.

### CHA/Ps Report Increased Capacity to Share Information on Cancer

On end-of-module surveys, learners were asked if, as a result of completing a cancer education module, their perceptions of comfort, confidence, preparation, and knowledge about cancer had changed. Responses are summarized in Table 2.

A total of 86% of unique CHA/P learners reported feeling more or much more capable on at least one of these items. Learners reported on about 80% of surveys that they felt more or much more knowledgeable about cancer, or more or much more comfortable, confident, or prepared to talk about cancer with their patients, friends, family, and in their communities. Learners also wrote in comments on approximately 215 surveys. The most common themes from these comments are included below:

**Table 2** CHA/P learners' reported changes in capacity to share cancer information

Question ending	As a result of completing this online learning module, I feel...					Average	Total survey responses
	Much less N (%)	Less N (%)	About the same N (%)	More N (%)	Much more N (%)		
Comfortable talking about cancer with my patients, family, friends, and in my community	6 (1%)	1 (0%)	86 (19%)	195 (44%)	159 (36%)	4.12	447
Confident talking about cancer with my patients, family, friends, and in my community	7 (2%)	1 (0%)	92 (21%)	189 (42%)	159 (35%)	4.10	448
Prepared to talk about cancer with my patients, family, friends, and in my community	6 (1%)	3 (1%)	92 (21%)	191 (43%)	155 (35%)	4.09	447
Knowledgeable about cancer	7 (2%)	3 (1%)	85 (19%)	210 (47%)	142 (32%)	4.07	447

- Modules were enjoyable and appreciated (60 comments): "I so greatly enjoyed this module, had a lot of information for my patients, family members I can pass on and for myself. Thank you"
- Modules were informative (48 comments): "in the beginning I didn't know much of cancer and now I know a whole lot about it and how to prevent it!" "its good information on many fronts and valuable out here in the rural areas"
- Planning to share information (42 comments): "will be able to talk to patients about screenings and preventions" "happy to help our native people to understand more"
- Feelings about cancer had shifted (21 comments): "With the given information I feel like I will be able to talk about this subject with less apprehension"

As a result of completing the online learning modules, all CHA/P learners reported that they planned to talk with their patients more often about cancer risk reduction behaviors, including talking with their patients more often about cancer screenings (90%), increasing physical activity (87%), cutting down on tobacco use and tobacco cessation (84%), and eating healthy (82%). Several learners wrote in ways that they planned to share cancer information with their patients, including "try to give my patients options on how and when to get checked or seen" and "If they smoke or chew, give them flyers or advice for them to quit or let them know that I will be here once they are ready to quit." Learners also shared that the modules were "new motivation to still give good patient education" and inspired them to "be more open about it to my patients and myself along with family members."

### Learners Plan to Talk with Patients More Often About Cancer Risk Reduction Behaviors

In response to a prompt about plans to talk with their patients, learners reported that they planned to talk with their patients more often about screenings, tobacco cessation, physical activity, and eating healthy. Survey responses are summarized in Table 3.

### Conclusions

The culturally-relevant online cancer education modules have increased CHA/P learners' self-reported capacity to share information about cancer with their patients, families, friends, and communities. The modules supported learners to plan to share information about cancer risk reduction

**Table 3** CHA/P learners plan to talk with their patients more often about cancer risk reduction behaviors

As a result of completing this online learning module, I plan to...	Respondents N (%)
Talk with my patients about cancer screening more often	71 (90%)
Talk with my patients about physical activity more often	69 (87%)
Talk with my patients about cutting down/quitting tobacco more often	66 (84%)
Talk with my patients about eating healthy more often	65 (82%)
Change something else about how I interact with patients	29 (37%)
Not change the way I interact with patients	0 (0%)
Total CHA/P learners	79 (100%)

behaviors with their patients. Given that healthcare provider counseling and recommendations on modifiable cancer risk factors are a significant determinant of patient behavior, learners' increased capacity and intent to engage with their patients about cancer is a promising indicator of future shifts in patient behaviors. However, further research would be needed to determine the extent of subsequent changes in patient behaviors.

The learning modules were developed to address Alaska's rural primary care providers' need for online access to timely, accurate, and relevant information about cancer. Online education relies on internet access, which all CHA/Ps have available in their clinics. However, many CHA/Ps do not have access to Internet at home, with only 52% of respondents to a 2015 online survey reporting daily access to internet at home [20]. Consequently, CHA/P participation in this educational opportunity relies on employer support of CHA/Ps engaging in the modules while at work. As of July 31, 2017, a total of 127 unique CHA/Ps had completed an end-of-module evaluation survey, representing over a third (34%) of all CHA/Ps. While this suggests that information about the modules has reached a large proportion of Alaska's CHA/Ps, the lack of a master contact list makes it unclear what percentage of CHA/Ps are aware of the modules. A master contact list of all CHA/P emails could have increased the reach of the modules and been an effective strategy to increase engagement. However, CHA/P learner demographics are very similar to the estimated CHA/P population, which suggests that the learners are representative. Despite this, it is possible that individuals engaged in the modules are systematically different than CHA/Ps that have not participated in the learning.

This article summarizes findings from completed cancer education evaluation surveys that assess learners' backgrounds, likes, critiques, suggestions, changes in capacity to share cancer information, and intent to talk with patients about cancer. Additional findings related to learners' intent to reduce their own cancer risk has been previously published in the *Journal of Cancer Education* [28]. The promising findings shared in this manuscript are self-reported changes in capacity and intent to change behavior. In theoretical models such as the Theory of Reasoned Action, the Theory of Planned Behavior, and the Integrated Behavioral Model, intention is seen as the most important determinant of behavior [27]. However, behavioral intention (such as intent to talk about cancer screenings with patients) may not necessarily be realized in lived behavior. A systematic review of healthcare professionals' intentions and behaviors found that intentions were a significant predictor of provider behavior in 50% of examined studies, while provider beliefs about their capabilities were a significant

predictor of behavior in 63% of examined studies [29]. These correlations were found despite the lack of a culturally relevant intervention to support either high levels of intent, increased beliefs in capabilities, or empowered intention of planned behavior. Additional research would be needed to assess the impact of the learning on realized provider changes in their interactions with patients and subsequent patient behavioral changes.

## Discussion

The developed online modules address a need for timely, medically-accurate cancer information for Alaska's rural primary care providers. Because of the modules, all CHA/P learners intended to improve the ways they talked with their patients about cancer, and 86% felt more/much more knowledgeable about cancer, or more/much more prepared, comfortable, or confident talking about cancer with their patients, family, friends, and community members. This culturally-relevant online cancer education may be adaptable to other contexts, including to other populations or content areas, particularly if the modified intervention was adapted with the learner population to contain relevant content delivery methods, such as local stories, visuals, and values. This culturally-relevant online learning has resulted in increased provider capacity, and intent, to share cancer information. In the words of learners:

I didn't know a whole lot about cancer before starting this whole cancer education course and now I feel a lot more comfortable in handing out information to patients and family.

By talking to our patients, we can save a life

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## Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest relevant to this article to disclose.

**Informed consent** In accordance with the procedure recommended and approved by the Alaska Area Institutional Review Board, the University of Alaska Anchorage Institutional Review Board, and the South-central Foundation (SCF) Executive Committee, the end of module evaluation surveys are research that involves the study of acceptable educational practices in a normal educational setting and are consequently not required to include informed consent.

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