Published in final edited form as:

Prev Med. 2005 June ; 40(6): 619–627. doi:10.1016/j.ypmed.2004.09.005.

Testing a culturally appropriate, theory-based intervention to improve colorectal cancer screening among native Hawaiians

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Abstract

Background—We tested an intervention based on social learning theory (SLT) to improve colorectal cancer (CRC) screening among Native Hawaiians, a group with low CRC screening rates.

Method—Sixteen Hawaiian civic clubs agreed to randomization. Eight control clubs received a culturally targeted presentation, a free Fecal Occult Blood Test (FOBT), and a reminder call. Eight experimental clubs also received culturally targeted education and free testing; but, in line with SLT, education was delivered by a Native Hawaiian physician and Native Hawaiian CRC survivor, and members received an FOBT demo, were challenged to involve a family member in screening, and were telephoned multiple times to address change-related emotions and barriers.

Results—One hundred twenty-one members age 50 and older from 16 clubs participated. At the club level. screening rates were modestly increased in four experimental clubs and six control clubs. Surprisingly, 64% of participants reported being up to date with CRC screening at baseline. Only 13 individuals (five in experimental arm and eight in the control arm) were screened for the first time through this intervention, increasing the percent screened from 59% to 67% in the experimental group and from 69% to 85% in the control group. Although individuals in the experimental arm were more likely to rate the intervention as culturally appropriate, both arms realized similar and significant gains in CRC knowledge, attitudes, intent, and self-efficacy.

Conclusions—For Native Hawaiian individuals belonging to a network or civic clubs, an intervention based on SLT delivered by a Native Hawaiian physician and CRC survivor was less effective at further increasing compliance than was a culturally targeted educational session delivered by a non-Hawaiian nurse. That CRC screening compliance was high prior to our intervention suggests that we targeted a very health conscious segment of the Native Hawaiian population. Future work should focus on underserved segments of this indigenous group.

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Keywords

Cultural diversity; Health services research; Mass screening; Pacific Islander Americans; Psychological theory

Introduction

In the state of Hawaii, colorectal cancer (CRC) is the second leading cause of cancer death for Native Hawaiian men and the fourth leading cause of cancer death for Native Hawaiian women [1]. Among Hawaii's five major ethnic groups (Caucasian, Chinese, Filipino, Japanese, and Native Hawaiian), Native Hawaiians have the highest CRC mortality rates in the state [2] and the lowest rates of regular CRC screening among adults 50 and older. For example, 2001 data from the Behavioral Risk Factor Surveillance System (BRFSS) suggested that 35% of Native Hawaiians had ever had a fecal occult blood test (FOBT) and 35% had ever had a sigmoidoscopy or colonoscopy, compared to 55% and 53% of Caucasians, respectively [3].

Despite these statistics, there are few structured interventions to increase CRC screening in Hawaii, and none are targeted to Native Hawaiians. In a review of U.S. mainland studies, adherence to FOBT completion was found to range from 10% to 30% in groups that received minimal or impersonal interventions. and increased to 50% in groups that received an FOBT kit and intensive follow-up from providers [4]. Of interventions explicitly based in theory, Weinrich et al. [5] found FOBT completion rates of 61% and 93% among participants in two interventions that incorporated constructs from social learning theory (SLT). This theory explains human behavior “in terms of a continuous reciprocal interaction between cognitive, behavioral, and environmental determinants” ([6] p. 22). Important concepts of SLT include: (a) expectations, or individual beliefs about likely results of actions; (b) observational learning, referring to an individual's beliefs based on observing respected others; (c) behavioral capability, which includes knowledge and skills needed to change behavior; (d) self-efficacy, or confidence in one's ability to take action; (e) reciprocal determinism, meaning that behavior change results from interactions between people and the environment; and (f) reinforcement and feedback from others [7]. For example, in Weinrich's study, low-income elders were trained to serve as role models to other low-income elders by making CRC presentations and helping participants overcome taboos, misinformation, and distrust [5].

Other researchers build a strong case for the cultural targeting of interventions using five strategies: (a) peripheral strategies (making materials attractive to the culture); (b) evidential strategies (presenting evidence of the relevance of the problem to the ethnic group); (c) linguistic strategies (using words and phrases from the group's language); (d) constituent-involving strategies (drawing directly on the experience of members of the ethnic group), and (e) sociocultural strategies (recognizing and working from the group's cultural values, beliefs, behaviors, and context) [8]. These strategies have been shown to improve intervention effectiveness in tobacco cessation, diet change, and screening behaviors [8–13].

Several values, traditions, and experiences should be considered in targeting interventions to Native Hawaiians. For example, Native Hawaiians come from an oral tradition that values face-to-face interaction and trust building [14]. The *ohana* (extended family) is central, decision-making tends to be collective, and educational traditions emphasize story telling and role modeling [15,16]. Many Native Hawaiians have experienced dispossession and discrimination in the state of Hawaii, resulting in a generalized distrust for Western systems of health care. Some Hawaiians, espceially those without medical insurance, are fatalistic about cancer [17]. Health education interventions that incorporate cultural values have been found to be successful in increasing screening rates among Native Hawaiians [15,18].

To test CRC screening interventions for Native Hawaiians, we partnered with the Association of Hawaiian Civic Clubs (AHCC), a non-profit umbrella organization of 4000 members affiliated with 43 individual clubs: 39 in Hawaii, two in California and one each in Nevada and Idaho. The AHCC is dedicated to fostering leadership and increasing civic participation among Native Hawaiians. Membership is restricted to individuals whose ancestors inhabited Hawaii prior to western contact in 1778 and their spouses (regardless of ethnicity).

In 2001, we conducted a preliminary study with 56 Hawaii-based civic club members, using focus group and survey methodology to examine CRC knowledge, attitudes, and behaviors. Only 12% reported compliance with screening recommendations. Findings also indicated a lack of knowledge about CRC and multiple barriers to screening, including inconvenience, procrastination. embarrassment. and fear of finding cancer. When asked about their willingness to participate in CRC screening, 72% said that they would participate if the tests were offered at no cost, and 75% would participate if urged to by Native Hawaiian physicians and CRC survivors. In focus groups with 10 civic club members, participants called for educational materials that were pertinent to Native Hawaiian (e.g., featured Native Hawaiians faces and gave statistics ubout CRC in Native Hawaiians and opportunities to teach others about CRC). These findings suggested that a culturally targeted intervention for Native Hawaiians could be strengthened by incorporating concepts from SLT.

This paper reports on our study comparing outcomes of a culturally targeted intervention incorporating strategies from SLT against a control condition. Due to an expressed distaste among Native Hawaiians for no-treatment control conditions [19], control groups were provided with a CRC educational program that did not incorporate strategies from SLT. Hawaiian civic clubs agreed to be randomized into the two arms of the study to determine which intervention was more effective in improving knowledge, attitudes, intention, self-efficacy, and practices related to CRC screening.

The interventions

Control arm—A non-Hawaiian nurse delivered a targeted educational presentation that included information on CRC's impact on Native Hawaiians (evidential); addressed the cultural context of lower-than-average insurance coverage and delayed access to care (sociocultural); and featured Native Hawaiian artwork (peripheral), words (linguistic), and faces (constituent-involving) [8]. All participants received a brochure on CRC that featured Native Hawaiian faces and the phone numbers for local providers. They also received a free FOBT kit, and the non-Hawaiian nurse gave basic instructions about completing it at home and mailing it to a state-wide laboratory for analysis. The FOBT was selected because of cost-effectiveness and convenience [20–22]. Those who did not complete their FOBT within a month of the presentation received a single telephone reminder call. A replacement kit was mailed upon request.

Expcrimenlal arm

Based on SLT, additional strategies were incorporated to increase mastery of FOBT use, model desired behavior, increase self-efficacy, and provide reinforcement relatcd to CRC screening (Table 1) [6,7], Specifically, a Native Hawaiian physician delivered the targeted educational presentation. A Native Hawaiian CRC survivor told his personal story, addressing myths and feelings of embarrassment relnted to CRC screening and communicating positive feelings associated with self-care and survivorship. Native

Hawaiians chosen to deliver these messages were individuals about whom civic club members voiced strong approval and respect, and a goal of their presentation was to raise group expectations about the need for, the right to, and the benefit of CRC screening. Following this, free FOBT kits were distributed, and the Native Hawaiian physician provided instructions on testing and demonstrated how to use the FOBT kit to collect stool samples using a child's potty and Play-Doh stools, a strategy that has proved effective in New York State [23]. Both speakers expressed confidence in participants' ability to follow-through with screening. Participants were challenged to share educational materials with a family member and invite him/her to call us for a free FOBT kit, which we hoped would reinforce learning, allow participants to demonstrate their knowledge and skills relative to the behavior, and increase expectations in the family about the benefits of CRC screening. Between 4 and 16 weeks post-presentation, multiple telephone calls were placed to those who did not complete their FOBT to address and help problem solve screening-related barriers (e.g., fear, logistics). Replacement kits were mailed upon request.

Both the experimental and control conditions were delivered at one of the civic clubs' regularly scheduled meetings. Because some clubs had more members than others and most welcome entire families to participate, anywhere between 5 and 50 individuals may have been present at the presentation, including between 3 and 20 individuals age 50 and older.

Methods

Sample

Following approval of study protocols by the University of Hawaii and Native Hawaiian Health Care Systems Institutional Review Boards in 2002, 16 of the 39 Hawaii-based clubs volunteered to participate. Among the 23 clubs that did not participate, 13 said they already had activities scheduled and 10 were not planning to hold meetings during the months when the intervention was to be delivered. Of the 16 participating clubs, eight were located in urban areas and eight were located in rural areas, and randomization was done for each stratum by coin toss. From these clubs, 131 members age 50 and older were enrolled in the study, and informed consent was obtained. Four participants were lost to follow-up—three died and one was found to have dementia—thereby reducing the sample to 127. Post-test data were collected from 121 (95%) of the 127, and analyses were limited to the 121 (69 in the experimental arm and 52 in the control arm). No statistically significant differences were found between the two groups on any of the demographic variables (Table 2). For the total sample, the mean age was 65.7 years. 72% were female, 90% were Native Hawaiian, 50% were married, 61% were retired, 61 % had attended at least some college, and 100% had health insurance.

Measures

Pre-intervention questionnaire—Each participant completed a demographic survey and a pre-intervention test of knowledge, attitudes. and behaviors related to CRC screening at the club meeting prior to the presentation. Demographic variables included age, gender, ethnicity, marital status, employment, education, and primary medical insurance. Participants were asked if they had completed an FOBT in past year, a sigmoidoscopy (in past 5 years), and/or a colonoscopy (in past 10 years) [24].

Knowledge was lested with 10 true–false questions; possible knowledge scores ranged from 0 = no correct answers to 10 = all correct answers (reliilbility alpha = .63). Respondents were asked to rate 10 attitudinal statements using a 4-point scale (1 = strongly disagree to 4 = strongly agree). One item—"CRC screening involves giving something from my body; this may reduce my *mana*,"—was included because of the traditional belief that one's *mana* (spirit or power) resided in all body pans. In traditional society, placentas were buried under a bush or tree, finger nail and hair clippings were hidden, and bones of the deceased were interred in secret places so that they could not be used by evil-doers to cast spells or otherwise harm the individual or family [25]. Negative items were reverse-scored before computing an attitude scale with possible total scores from 4 = negative view on all items to 40 = positive views on all items (alpha = 0.91). The 4-point scale (1 = strongly disagree to 4 = strongly agree) also was used to rate three items measuring intent to get screened and to talk to others about screening (alpha = 0.91) and three items measuring self-efficacy (alpha = 0.94). The knowledge, attitudinal, intenl, and self-efficacy items were developed by the investigators and are shown in Table 5.

FOBT results—FOBT results were mailed by the laboratory to the researchers, who forwarded them to participants and their physicians. A single reminder call was made 4 weeks after the presentation to those individuals in the control clubs who had not completed their FOBT. Reminder calls (which included efforts to address personal emotions and barriers) were made to members of experimental clubs starting at 4 weeks post-presentation and ending 16 weeks post-presentation. Notes were kept on club member comments. No completed FOBT kits were returned from either group after 16 weeks post-presentation.

Post-intervention questionnaire—Eight to 10 weeks after the initial meeting, subjects were mailed post-intervention questionnaires to reassess CRC knowledge, attitudes, intent, and self-efficacy. They also were asked to rane their level of agreement (1 = strongly disagree to 4 = strongly agree) with seven statements about the intervention (e.g., “I enjoyed the presentation on CRC screening.” and “The project was culturally appropriate.”). Three open-ended questions asked what they liked best and least about the project and, if they had not completed the FOBT. why not.

Because only 30% of participants returned their post-intervention questionnaires in response to the initial mailing, two additional mailings were done, one in January 2003 and another in February 2003, which raised the response rate to 50%. The remaining non-respondents were asked to complete the post-test when we revisited their club between March and May 2003 or were telephoned in June 2003 to complete the post-test. Through these efforts, we obtained a 95% data-completion rate. Additionally, resenrchers telephoned the 13 individuals who, through this project, completed CRC screening for the first time to ask why they had not been screened before and what made them decide to complete the FOBT at this time.

Analysis

Pre- and post-intervention scores on the knowledge test and the attitudinal, intent, and self-efficacy items were compared using paired-sample *t* tests. FOBT completion rates were compared using the chi-square test. Close-ended items soliciting feedback on the intervention were compared between groups using unpaired *t* tests. Responses to open-ended questions from the post-test, follow-up telephone calls, and club visits were transcribed, categories developed, answers subsequently coded, and categories counted. Because clubs, rather than individuals, were our sampling unit, we used complex sample design analysis to account for the sample design and its associated standard errors when testing between-condition differences in post-intervention measures of knowledge, attitudes, intent, self-efficacy, and CRC screening [26].

Results

Looking at the club level, four of the experimental clubs and six of the control clubs showed modest improvement (1–2 people) in members screened (not shown in table). Surprisingly, 64% of participants reported being up to date with CRC screening at baseline, 59% in experimental clubs and 69% in control clubs (NS; Table 3). Although 23 (33%) individuals in the experimental arm and 21 (40%) in control ann completed the free FOBT, this included 31 individuals who were already up-to-date with CRC screening. Only 13 individuals (11%) were screened for the first time through our program—5 in the experimental arm and 8 in the control arm. First-timers reported that they had not been screened previously because they did not know about CRC and CRC screening recommendations ($n = 7$) or had not been told by their physician to get screened ($n = 6$). First-timers gave multiple reasons why they chose to get screened at this time: 8 because the activity was sponsored by the civic clubs, 6 said the presenter made the FOBT look easy, 4 were impressed that we made a special effort to come to the community, and 4 were motivated by the recent CRC death of someone they knew (not shown in table). Three participants had a positive finding; all three received appropriate follow-up tests and none were found to have CRC. Still, 31 participants (26%) remained unscreened at the end of the intervention. Complex sample design analysis suggests that members of the experimental condition were significantly less likely to be screened post-intervention than members of the control condition (OR = .364, 95% confidence intervals = 0.14, 0.97).

Both groups realized significant improvements in CRC knowledge (Table 4). Significant increases were seen for both groups in percent agreeing that people with colon polyps are at greater risk of CRC and in the percent disagreeing that CRC causes symptoms and that only people with symptoms need CRC screening (not shown in table). Significant increases were seen in attitudes toward CRC screening as well. Looking at the item about *mana*, 15% of participants (9 in each group) agreed upon pretest that CRC screening would reduce their *mana* (power), but only 3% (2 in each group) agreed with that statement upon posttest. Both arms significantly increased their scores on the intent and self-efficacy measures as well. Despite the long period of time over which post-intervention questionnaires were completed, no associations were seen between time-to-completion and knowledge, attitude, intent, and self-ellicaey scores. Also. complex sampling analysis suggested no significant differences between groups on any of these measures either pre-intervention or post-intervention.

Participants in the experimental and control arms were similarly positive in their appreciation of the free FOBT kit and reminder calls (Table 5). Participants in the experimental arm were significantly more likely to agree that the speaker's ethnicity motivated them to participate and that they enjoyed the presentation, learned something new from it, found the brochure easy to understand and felt the project was culturally appropriate ($P < 0.05$ for all).

A summary of responses to open-ended questions also is provided in Table 5. When asked whal they liked best, a larger proportion of the experimental arm content (68% vs. 40%) and delivery (57% vs. 29%), and a greater proportion of the control arm cited the free FOBT (25% vs. 15%). (Nole: 23 participants in the experimental arm gave more than one response to this item), Although only one person wrote that the intervention was “culturally appropriate,” the comments pertaining to delivery suggest that attempts to be culturally appropriate were appreciated, Specifically, participants in both arms liked that the project was brought to their communities, that results were shared. that presenters were respectful of Native Hawaiians. and that presenters showed that they cared about Native Hawaiians and individual club members. Other words used to describe both the Hawaiian and non-Hawaiian presenters were humble, non-judgmental, kind, helpful, friendly, personal, sweet, nice, and enthusiastic. For the 26 individuals who responded to this item, the least-liked element of the intervention was the FOBT itself, for example, having to touch the stool, keeping samples over a few days, and restrictions on food and drug intake (*n* = 22). Only four wrote about personal barriers, including fear and embarrassment.

Looking specifically at the SLT-inspired components, only 20 participants in the experimental arm (29%) tried to engage family members in screening, and only four family members completed a free FOBT (Table 3). Despite our efforts to provide unscreened individuals in the experimental arm with multiple reminder telephone calls to help address personal fears and perceived barriers, we averaged only two connecting calls to each (participants were rarely home or did not answer their phones), and no one admitted to barriers to screening over the telephone. Rather, individuals claimed that they intended to complete the FOBT at some future time. None reported that they had meanwhile completed a CRC screening endoscopy.

We successfully revisited 13 of the 16 clubs to share findings from the project. (The other three were too busy to host us.) Specific to the club, we presented the number of participants, the number up to date with screening prior to the intervention, the number that completed the free FOBT, and the number that had never been screened. In soliciting additional feedback, we asked members to speculate why we found a baseline CRC screening rate of 64% in 2002 (when BRFSS data and our 2001 study suggested much lower rates) and why outcomes in the two study arms were so similar. In response, participants suggested that members had been affected by increased attention to CRC nationally (e.g., the CRC campaign of Katie Courie, co-anchor of the television show “Today”) and locally, recalling the CRC death of Loyal Garner, a well-known Native Hawaiian entertainer, and the survival of the AHCC's president, diagnosed in November 2001. They suggested that greater benefits of interventions such as this may realized by Native Hawaiians who are not “joiners” and/or have lower rates of employment and insurance coverage. When we asked why some members were still unscreened, they pointed to the burdensomeness of current CRC screening methods and asked about the potential development of new, less onerous methods.

Discussion

Although members in the experimental arm were more likely to rate the intervention as culturally appropriate, both arms realized similar gains in CRC knowledge, attitudes, intent, and self-efficacy and, at the end of the study, control clubs had fewer unscreened members than experimental clubs. Thus, we conclude that for Native Hawaiian individuals belonging to a network of civic clubs, the SLT-based intervention was less effective than the culturally targeted education delivered by a knowledgeable and caring non-Hawaiian nurse.

In discussing these findings, several limitations of this study must be acknowledged. First, 64% of participants were up to date with screening prior to their participation in the study, which reduced our ability to test the difference between the experimental and control conditions and, in fact, called into question the need for a CRC screening intervention for this segment of the Native Hawaiian community. Second, we lacked a no-treatment control group. Finally, we had difficulties getting participants to complete the follow-up knowledge and attitude questionnaire by mail, lengthening the time it took to complete data collection.

Participants attributed the fact that 64% of participants were up to date with CRC screening to celebrity attention to the issue (e.g., Katie Courie and Loyal Gamer) and the CRC experience of the civic club president. Both interventions perhaps reinforced the behavior of the majority of participants, motivating 31 individuals to get re-screened and 13 to get screened for the first time. We certainly helped increase knowledge about CRC, and perhaps participants were receptive to new knowledge about CRC given their pre-intervention exposure to CRC. However, findings also suggest that we were working with a very health conscious subgroup of Native Hawaiians. Civic club members appeared to be vely active people and proud of their broad interests and involvement. All 121 participants had health insurance, and many had worked in jobs requiring annual physicals. Perhaps, greater benefits would realized by Native Hawaiians who are not members of civic clubs and/or have lower rates of employment and insurance coverage [10,27].

Because we relied on self-report to determine prior screening rates, we wondered if the 64% figure was accurate. Research on the level of agreement between self-reported screening and medical records suggests fairly high sensitivity (> 0.90) but low specificity (between 0.50 and 0.60), with individuals tending to underestimate the time since last screening [28,29]. Working with a local Health Maintenance Organization (HMO), we obtained an aggregated summary of CRC screening rates for the 54 members in our sample who were also HMO members, which suggested that about one third of those who reported being up to date with CRC screening really were not. Future projects should determine the accuracy of self-reponed CRC screening and/or get permission from participants to verify screening participation through medical record review.

Another challenge to our study was the lack of a no-treatment control. So, although both the experimental and the control arms produced a modest improvement in screening, we cannot say for certain that either condition was better than no treatment. It is conceivable that secular trends may be working to increase screening rates among all Native Hawaiians, although per BRFSS, the 2002 rates of ever completing an FOBT or endoscopic CRC screening procedure were similar to the 2001 rates (39% vs. 35% for FOBT, and 34% vs. 35% for screening endoscopy, respectively). We chose against a no-treatment control because of expressions in the Native Hawaiian community of a distrust of research and researchers [16]. Native Hawaiians have voiced concerns ubout huving little or no input into research ideas, design, dissemination, or interpretation of research findings, and those who have participated in research fell they were “used as guinea pigs” and exploited to advance the researcher's career [19]. Additionally. rescarch has been criticized because it has not addressed the concerns of the group. has been conducted in culturally inappropriate ways, and in some cases has caused harm by perpetuating stereotypes of Hawaiians as unhealthy [19]. Thus, the Native Hawaiian investigators on this project (MEK and MLK) proposed the current design, which was well received by the AHCC und likely contributed to the civic clubs’ willingness to panicipate in this study.

Third, we had difficulty obtaining adequate completion rates when post-tests were mailed to participants. Best response was obtained through in-person contact (i.e., having members complete questionnaires at club meetings) and secondarily by telephone (although it took several calls before finding the participant at home). Given the preference of Native Hawaiians and other Pacific peoples for personal contact and oral communication [14,17], we recommend that future studies collect data through personal interviews, meetings, or telephone rather than by mail.

Why did the SLT-inspired intervention not produce better results? It appears that the culturally targeted presentation, regardless of who presented it, worked well in both arms. This presentation included a slide show and brochure fealuring Native Hawaiian facts and faces. The speakers, regardless of ethnicity, were perceived as respectful and caring toward Native Hawaiians and individual club members. FOST kits were free, and study results were shared at a club meeting. It was not costly to develop a culturally targeted slide show and brochure, and it is gratifying to know that etlective delivery of a culturally targeted message is not dependent on having multiple presenters or featuring Native Hawaiians physicians and survivors.

The SLT-inspired components—having information presented by a Native Hawaiian physician and survivor, demonstrating how to use the FOBT, challenging participants to encourage a family member to take part in free FOBT screening, and making multiple telephone calls to address fears and barriers—did not result in better results for the experimental group. The latter two components were not even successful, in that few experimental arm participants took materials for family members, even fewer engaged family members in free screening, and participants did not admit to having fears about screening and did not identify barriers other than lack of time. The finding of fewer unscreened participants in control clubs (15%) compared to experimental clubs (33%) at the end of the intervention is especially provocative. Perhaps, the SLT-inspired components of the family-member challenge and the multiple reminder phone calls made the experimental arm too invasive and burdensome, leading some to passively resist calls for screening participation. It also is possible that there were differences across clubs that we did not anticipate and control for. Future work is needed to understand more about people who do and do not change their patterns of screening behavior.

In conclusion, Native Hawaiians belonging to civic clubs had higher rates of CRC screening than the general Native Hawaiian population, and an intervention based on SLT was less effective at further increasing compliance than was a targeted educational session. Still, BRFSS data suggest that CRC screening rales among Native Hawaiians lag behind those of other ethnic groups in Hawaii. The project may have had better success with an underserved segment of the Native Hawaiian community.

Acknowledgments

The study, initiated and conducted by the authors, was funded by the National Cancer Institute, grant #CA86105. Acknowledgments are tendered to Kalani Brady, MD, Kyle Chong, Luis Cruz, Cynthia Harris, RN, Peter Holck, PhD, Jordan Lee, Monica Mau, Linda Mitchell, RN, Charles Rose, Tom Vagt, MD, Ryan Young, Diagnostic Laboratory Services, the Honolulu Black Nurses Association, and Hawaii's Cancer Information Service.

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Table 1

Conceptual frameworks guiding development of control and experimental conditions

Concepts	Application
Culturally targeted presentation (control condition)	
• Peripheral strategies. Making materials attractive to the culture.	• Materials featured Native Hawaiian artwork and scenery.
• Evidential strategies. Presenting evidence of the relevance of the problem to the ethnic group.	• Materials included information on CRC's impact on Native Hawaiians.
• Linguistic strategies. Including words and phrases from the group's language.	• Materials featured Native Hawaiian words and phrases.
• Constituent-involving strategies. Drawing directly on the experience of members of the ethnic group.	• Materials featured Native Hawaiian faces and were delivered at regularly scheduled civic club meetings.
• Sociocultural strategies. Recognizing and working from the group's cultural values, beliefs, behaviors, and context.	• Materials addressed the cultural context of lower-than-average insurance coverage and delayed access to care among Native Hawaiians. In respect for the value of *ohana* (family), people of any age were welcome at presentations.
SLT-inspired components added to culturally targeted presentation (experimental condition)	
• Expectations. Individual believes that action will have desired results.	• The culturally targeted presentation was delivered by a Native Hawaiian physician and CRC survivor, who spoke to raise expectations about the need for, right to, and benefit of CRC screening.
• Observational learning. Individual's beliefs are based on observing respected others.	• Native Hawaiian physician and CRC survivor were respected role models. Survivor found cancer through screening and took immediate action.
• Behavioral capability. Individual has necessary knowledge and skills.	• Use of the FOBT kit to collect stool samples was demonstrated using a child's potty and Play-Doh stools.
• Self-efficacy. Individual has confidence in his/her ability to take action.	• Participants had opportunity for return FOBT demonstration. Both speakers expressed confidence in participants' ability to follow-through with screening. Participants were challenged to engage a family member in free FOBT screening.
• Reciprocal determinism. Behavior change results from interactions between people and the environment.	• Speakers raised group expectations about the need for, right to, and benefit of CRC screening. Participants received reminder calls. Participants were challenged to engage a family member in free FOBT screening.
• Reinforcement. Motivation to change can be increased by appropriate prompts and feedback.	• Participants received multiple telephone calls to encourage screening and to address barriers.

Table 2

Demographic characteristics of the intervention and control groups[a]

	Experimental (*n* = 69)	**Control (*n* = 52)**
Mean age (years)	65.68	65.77
Gender		
Female	48 (70)	39 (75)
Male	21 (30)	13 (25)
Ethnicity		
Hawaiian	62 (90)	47 (90)
Non-Hawaiian	7 (10)	5 (10)
Marital status		
Never married	4 (6)	4 (8)
Married	38 (55)	23 (44)
Disrupted	27 (39)	25 (48)
Employment		
Employed	30 (43)	17 (33)
Retired	39 (57)	35 (67)
Education		
Some high school	6 (9)	7 (13)
High school/GED	20 (29)	14 (27)
Some college/technical degree	19 (27)	12 (23)
College degree	13 (19)	11 (21)
Graduate courses or degree	11 (16)	8 (15)
Primary medical insurance		
Medicaid	2 (3)	3 (6)
Medicare	23 (33)	19 (36)
Private insurance	44 (64)	30 (58)

[a] None of the between-group differences was significant.

Table 3

CRC screening behaviors prior to and following intervention, by individuals

	Experimental ($n = 69$)		Control ($n = 52$)	
	Pre	**Post**	**Pre**	**Post**
Already up-to-date with CRC screening	41 (59)		36 (69)	
FOBT within past year	21 (30)		20 (39)	
Colonoscopy within past 10 years	30 (44)		22 (42)	
Completed free FOBT		23 (33)		21 (40)
Positive FOBT result[a]		3 (9)		0 (0)
Followed up on positive results[a]		3 (9)		na
First time screener[a]		5 (22)		8 (38)
Took FOBT kit for family member		20 (29)		na
Family member completed free FOBT[b]		4 (20)		na
Screened, either through intervention and/or on own[c]		46 (67)		44 (85)
Unscreened[*]		23 (33)		8 (15)

[a] Those that completed the free FOBT comprise the denominators for associated percentages.

[b] Those that took an FOBT kit for family members comprise the denominator for the associated percentage.

[c] Of those completing a free FOBT, 20 individuals in the experimental group and 13 in the control group were already up to date with CRC screening.

[*] $P < 0.05$.

Table 4

Pre–post measures of knowledge, attitudes, intent, and self-efficacy[a]

	Experimental ($N = 69$)		**Control ($N = 52$)**	
	Pre	**Post**	**Pre**	**Post**
Knowledge[b]	5.14	8.12*	5.11	8.57*
Attitudes[c]	28.97	34.47*	29.08	33.13*
Intention[d]	8.61	10.71*	9.38	11.02*
Self-efficacy[e]	8.73	11.17*	9.74	11.54*

[a] There were no significant differences between groups on pre-intervention or post-intervention measures. However, significant within-group improvement was seen on all measures.

[b] 10 true–false knowledge items included: having family history of CRC increases risk; people with colon polyps are at higher risk; all colon polyps are cancerous; screening decreases death from CRC: office rectal exam is good CRC screening test; only people with CRC symptoms need screening; CRC always causes symptoms; CRC is most curable when caught early through screening; for most people, CRC screening should start at age 50; and people with family history of CRC or polyps should start screening at a younger age than others. Possible range of scores was 0 to 10; alpha = 0.63.

[c] Ten attitudinal statements included: I am interested in screening because someone close to me had cancer; I am interested in CRC screening; I am afraid that screening is painful; screening will reduce my *mana*; screening is embarrassing; CRC is not a problem for Hawaiians; I do not want to know if I have cancer; if I have cancer it will kill me, so there is no point in getting screened; I am not comfortable talking about CRC; and I am not comfortable touching my stool. Items were rated on a 4-point scale from 1 = strongly disagree to 4 = strongly agree. Possible range of scores was 4 to 40; alpha = 0.91.

[d] Three items about intention to talk to doctor about screening, participate in screening, and talk to family about screening were rated on a 4-point scale from 1 = strongly disagree to 4 = strongly agree. Possible range of scores was 3 to 12; alpha = 0.91.

[e] Three items about confidence in ability to complete FOBT, explain importance of CRC screening to family, and explain FOBT to family were rated on a 4-point scale from 1 = strongly disagree to 4 = strongly agree. Possible range of scores was 3 to 12; alpha = 0.94.

[*] $P < 0.001$.

Table 5

Perceptions of the project

	Experimental (n = 69)	**Control (n = 52)**
Perceptions of the project[a]		
I enjoyed the presentation on CRC screening.	3.92*	3.68
I learned something new from the presentation.	3.78*	3.51
The brochure was easy to read and understand.	3.47*	3.00
The project was culturally appropriate.	3.91*	3.73
The ethnicity of the speaker made me want to participate.	3.93*	3.67
I appreciated getting a free CRC screening test	3.94	3.82
I appreciated getting a reminder call about my CRC screening test.	3.83	3.83
What did you like best?[b]		
Content: The information provided was important, educational, clear, understandable, and timely.	46 (67)	21 (40)
Delivery: The project was brought to the community, and results were shared; the presenters were respectful of Native Hawaiians and showed that they cared.	39 (57)	15 (29)
The test was simple, quick, painless, and free, and our results were provided to us.	10 (14)	13 (25)
No response	0	3 (6)
What did you like least?		
Using the FOBT kit to collect stool samples and having to restrict intake of aspirin and certain foods.	10 (14)	12 (23)
Personal barriers, including fear, embarrassment, and resistance.	2 (23)	2 (4)
No response	56 (81)	38 (73)

[a] Number of percent who “strongly agreed” with this statement.

[b] Twenty-three participants in the experimental arm gave more than one response to this item.

* $P < 0.05$.