



Implementation and Outcomes of a Community-Based Educational Program for Colorectal Cancer Prevention in Hispanics

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Abstract

Objectives: Colorectal cancer (CRC) is the 2nd most diagnosed cancer and leading cause of cancer death in Puerto Rico. However, CRC screening rates remain low. The aim of this study was to test the effectiveness of a Train-the-Trainers' (TTT) program to develop trainers capable of educating others within their communities about CRC prevention.

Methods: The TTT program consisted of didactics and seminars to capacitate participants to become trainers in CRC prevention. This project was evaluated using three components: (1) training workshops; (2) community educational sessions; and (3) the participant's experience as a trainer. Pre- and post-tests on CRC screening knowledge were given to TTT participants. Program effectiveness was determined by the pre- and post-tests, number of workshop participants completing a community educational session within three months of training and the number of community members reached.

Results: Among the 115 total participants, 97 participants took the pre- and post-test. There was a significant difference in the scores for the pre-test (M = 10.56, SD = 2.57) and the post-test (M = 11.43, SD = 1.83) given; $t(96) = -4.68$, $p < 0.001$. A total of 955 community members were reached. Participants from the community educational sessions (n = 680) evaluated the program. 77.7% of those participants expressed intent to undergo colonoscopy screening in the future.

Conclusions: TTT was effective in preparing trainers in CRC prevention. Participants increased their knowledge about CRC prevention and successfully reached members of their community. Utilization of community trainers is an effective alternative to increase CRC education and awareness in Hispanic communities, which may positively impact CRC screening rates in this population.

Introduction

Colorectal cancer (CRC) affects about 5% of the population, with up to 136,830 new cases in the United States in 2014 [1]. In Puerto Rico (PR), CRC is the 2nd most frequently diagnosed cancer and the leading cause of cancer death among men and women [2]. CRC is a preventable and treatable disease. However, prognosis is very low when diagnosed at an advanced stage. Early detection and diagnosis increase treatment prospects and improves survival [3].

The screening tests recommended for CRC prevention include: Fecal Occult Blood Test (FOBT), sigmoidoscopy, or colonoscopy [3,4]. Despite the increasing incidence of CRC among PR Hispanics and the established benefits of screening, routine CRC screening rates continue to be low. Based on the Behavioral Risk Factors Surveillance System (BRFSS), in 2012 only 26.4% (95% CI: 24.7-28.1) of adults ≥ 50 years old (y/o) in PR had undergone stool-based CRC screening during the previous 2 years and 47.2% (95% CI: 45.3-49.2) of adults ≥ 50 y/o had undergone a colonoscopy/sigmoidoscopy at any point in their lives [5]. PR's current CRC screening rates are below the baseline established by Healthy People 2020, which is 59.2% of adults aged 50 to 75 years (age-adjusted), and its overall goal of 70.5%. The low screening rates reported among Puerto Ricans illustrate the need for increased outreach in this population [5].

There are multiple studies that show that racial and ethnic minority groups in the U.S. undergo fewer CRC screening tests and are less likely to be up-to-date with routine CRC screening [6-13]. The American Cancer Society reports that Hispanics > 50 y/o had an age-adjusted CRC screening rate of 47% compared to 62% for non-Hispanic Whites, 56% for Blacks, and 46% for Asians [14]. Some of the most common factors cited as barriers for CRC screening include: low income, being uninsured or underinsured, low education attainment, reduced routine doctor's visits, living in a rural area, low rate of physician recall for screening in individual clients, and a low awareness of screening and its benefits [4,15-17]. We believe some,

Indexing Terms

Colorectal cancer prevention, Train-the-trainers, Community-based education, Hispanics

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Table 1: Pre & post-test given to participants of the Train-The-Trainer Sessions. Statements were to be completed with “true” or “false”.

1. Colorectal Cancer affects mainly males.
2. Colorectal Cancer is preventable.
3. Cancer of the colon and rectum is a tumor that affects the large intestine.
4. Colorectal Cancer screening should be done once a person turns 50 years old.
5. Cancer of the colon and rectum only affects people with family history of rectal cancer.
6. Everyone that has Colorectal Cancer presents symptoms.
7. Colonoscopy is one of the methods of prevention for Colorectal Cancer.
8. The majority of colon and rectal cancer begins from a polyp.
9. Smoking, drinking alcohol, and a diet high in fat decreases your risk of colorectal cancer.
10. Fecal occult blood is one of the screening methods for colon and rectal cancer.
11. A colonoscopy done by a certified professional (gastroenterologist or colorectal surgeon) is a safe process.
12. There is a greater change that you have colorectal cancer than the risks that comes from the screening test.
13. 1 in 25 Puerto Ricans will have colorectal cancer.

if not all, of these factors play a role in the non-ideal CRC screening figures reported in Puerto Rico.

Educational programs to increase CRC screening and prevention awareness have been developed by nationwide, community-based voluntary health organizations and federal agencies such as the American Cancer Society and the U.S. Centers for Disease Control and Prevention. The Puerto Rico Colorectal Cancer Coalition (PRCCC; www.cancercolonpr.org), a non-profit foundation based in PR with a mission to increase education on CRC prevention, developed and validated an educational program in the Spanish to increase awareness and promote CRC prevention. We hypothesized that developing community-trainers using a “Train-the-Trainers” (TTT) format would be an effective way to increase CRC screening and prevention awareness. With this TTT format, a community-trainer could be empowered to provide guidance within their respective communities resulting in a multiplicative effect. The aim of this study was to test the effectiveness of a TTT CRC educational program in developing community-trainers capable of educating others within their communities.

Methods

Development of the educational material

Ethics approval was obtained from the University of Puerto Rico (IRB-A2210211). The TTT educational program was adapted from patient educational materials focusing on healthy lifestyles and CRC prevention provided by the American Cancer Society and the Centers for Disease Control and Prevention (http://www.cdc.gov/cancer/colorectal/basic_info/screening) during 2010-2011. The PRCCC (www.cancercolonpr.org) reviewed, adapted, and translated the educational content used for the training sessions to Spanish. The final educational material was validated with several focus groups for content validity. Level of comprehension was standardized at an 8th grade reading level. The CRC Prevention Toolkit materials are available in an online appendix.

Educational program phases: The educational program had three components: (1) Phase 1-TTT educational workshops delivered in person, (2) Phase 2- community educational sessions delivered by the trained TTT participants, and (3) Phase 3-evaluation of the TTT participants experience when delivering the training intervention. Both qualitative and quantitative methods were used to collect data.

Two TTT workshops (Phase 1) were delivered in half-day sessions in two towns in PR: one in San Juan (metropolitan area) and the other in Guánica (southern area of the island). The workshops consisted of a *didactic* component (provided through lectures by an expert facilitator) and a *practice*, hands-on session where participants performed role-playing sessions as “Trainers” with the supervision of a facilitator. The four facilitators who conducted the workshops were members of the American College of Gastroenterology and the

PR Gastroenterology Association. They all had a health background and were also members of the PRCCC. The trainees were invited to participate in the workshops voluntarily and no stipends were given. Participants were invited from professional associations, private health insurances, hospitals and/or clinics, private medical offices, academic institutions, UPRCCC and churches. TTT workshop participants were provided with a CRC Prevention Toolkit that included: didactic presentations (in several formats including a Power Point presentation, flipcharts, and brochures), evaluation forms, and a TTT instruction manual (containing information on the process of conducting community training sessions). During workshops, participants were asked to complete a pre- and post-test knowledge questionnaire (Table 1), which was delivered using an automatic response system for immediate feedback. The automatic response system allows participants in the training to respond to questions projected on a screen and see everyone’s results in real time, allowing for immediate feedback on their answers.

Both qualitative and quantitative methods were used to collect data. Participants’ characteristics were described using frequency distributions for categorical variables. Pre-and post-tests results were assessed using paired t-test and McNemar. Statistical analyses were performed using SPSS version 17 (SPSS Inc.) and STATA version (Texas).

Participant community educational sessions: TT participants were asked to use the CRC Prevention Toolkit to provide community educational sessions, which could be held at community centers, churches, worksites, with family, etc. Participants were free to use any of the educational materials provided according to the needs of their audience. They were asked to train at least 10 community members and to complete an evaluation form that assessed reach, satisfaction, and community participant background information.

To be included in the effectiveness analysis, community sessions had to be completed within three months after the TTT workshop. Effectiveness of the TTT Program in developing community-trainers was determined by the number of participants in the TTT workshops who completed a community educational session and submitted the evaluation forms within three months of the training. No further follow up was done to the participants of TTT and the community participants.

Participants experience when delivering training interventions: In the third and final part of the evaluation component, interviews were conducted on 10 participants. These TTT participants were classified in two distinct profiles: Profile A, the-Completers - those who *did* conduct community sessions and Profile B, the Non-Completers - those who *did not* conduct the community sessions. Evaluation of baseline demographic characteristics and qualitative interviews were recorded.

Results

The TTT workshops hosted a total of 115 participants; 62 were from San Juan (metropolitan area) and 53 from Guánica (southern area of the island) (Table 2). Participants consisted of nurses, health care providers, members from faith-based communities, and members from community organizations. Of the 115 participants, 109 filled out evaluation forms. 80.7% (n = 88) were females (ranging from 18 to 68 years old). More than half of the participants (57%, n = 61) reported having at least a bachelor’s degree and 29.9% (n = 32) informed to have graduate studies. The majority of the participants (65.7%, n = 71) expressed that their principal motivation to be part of this study was to increase their knowledge.

Train-the-trainer session knowledge test

TTT participants were asked about their previous knowledge on CRC and CRC prevention. Twenty-seven percent (27.5%, n = 30) responded they had “No” previous knowledge on CRC, 50.5% (n = 55) had “Some” previous knowledge, and 22.0% (n = 24) had “A Lot” previous knowledge. To assess immediate impact of the TTT session

Table 2: Colorectal cancer education train-the-trainer participants.

	TTT Workshops Participants	Community members*
Number of Participants	n = 115	n = 680
Location of Participants	San Juan (53.9%) Guánica (46.1%)	- -
Gender of Participants	Female (80.7%) Male (19.3%)	Female (71.9%) Male (28.1%)
Education Level	Bachelor's Degree (56.5%) Master/doctoral level (9.6%) Not reported (48.9%)	Bachelor's Degree (33.8%) High School (27.5%) Not reported (38.7%)
Age Range (years)	18-68	22-80
Principal Motivation	65.7% to increase CRC knowledge	To gain more knowledge/information

*Data provided only for those participants in the community sessions who completed the evaluation form.

Table 3: Colorectal cancer screening in community members ≥ 50 years who intend to have a colon cancer-screening test in the future (n = 301).

Type of Screening Test	Frequency	Percentage (%)
Colonoscopy	234	77.7
Enema double contrast barium	112	37.2
Fecal Occult Blood Test	54	17.9
Sigmoidoscopy	53	17.6
None	18	6.0

Note: Table 3 participants could check more than one answer, thus leading to a total percentage greater than 100.

with regards to basic CRC concepts, a 13-item questionnaire (Table 1) was administered to all participants before and after the educational sessions. A significant increase in knowledge after attending the TTT session was observed (pre-test M = 10.56, SD = 2.57; post-test M = 11.43, SD = 1.83; $t(96) = -4.68, p < 0.001$).

Community educational sessions

Ninety-seven of the 115 (84.3%) TTT participants were contacted by phone or email within three months after completion of the TTT workshop and 40 (41.2%) said they had the intention to schedule workshops in the community. Only 23 (23.7%) of the 97 participants organized community sessions using the Tool Kit provided and submitted evaluations from the community participants within three months after the workshop. A total of 955 community members were reached and 680 evaluations were received. Baseline characteristics of the community participants are shown in table 3. The 680 community members reached ranged in age from 22 to 88 years; 71.9% (n = 489) were female. About one-third (33.8%, n = 200) reported having a bachelor's degree, 27.5% (n = 163) had a high school education and 13% (n = 88) did not report their educational status. Most community participants (75.4%, n = 421) expressed that their principal motivation to participate in the educational sessions was to gain knowledge and information. In contrast to the TTT participants, most of the community-based participants reported "None" or "Little" knowledge on CRC (60.4%, n = 411) and CRC prevention (59.7%, n = 406). Among the community members who participated in the educational sessions and were ≥ 50 years old (n = 301), only 55.4% reported having had any type of CRC screening. The most prevalent reason for not undergoing CRC screening was lack of knowledge about CRC screening or that they never thought to ask their doctor about it. After participating in this program, the vast majority (94%, n = 301) of community participants at the screening age stated that they would undergo CRC screening (Table 3).

Train-the-trainer participant experiences

A total of ten participants were selected to participate in a short interview about their experiences delivering the training intervention following the Success Case Method. Interviews were conducted with five participants that gave community sessions and five that did not give community sessions. TTT participants were interviewed and divided in profiles according to whether or not community sessions were completed: Completers (those who gave the community sessions) and Non-Completers (those who did not give the community sessions). Nurses, nutritionists, and representatives of the community made

up the completer group. This group had high levels of educational attainment ranging from Ph.D. (1), Master's (3), and Bachelor's (1) degrees. Participants in the Completer group, when asked what they thought of the design of the TTT program, offered these quotes: 1) "I would like to count on help so that I could offer it to the participants because they had many questions that only doctors could answer. Also, it would have been very useful to have a large poster of a polyp to demonstrate"; 2) "The training is very complete, but it needs to be adapted to focus on the main topics since it is really extensive in material". In the Non-Completer group, the professions included were nurses, nutritionists, and social workers. Their educational backgrounds were at the Bachelor's (4) and Master's (1) degree level. This group indicated that lack of time was the barrier that prevented them from conducting the workshops. Some key quotes from this group's participants were: 1) "I believe that the topic requires one to answer questions and I am not that familiar with the topic", 2) "In choosing professionals, time commitment becomes a limitation because we have to do the workshop outside of our work hours and it's difficult for us to do".

Conclusions

The primary aim of this study was to test the effectiveness of a "Train-The-Trainer" program to empower community participants to become community trainers on CRC screening and prevention. Twenty percent of TTT participants (23.7%, n = 23 out of the 97 contacted participants) submitted evidence of completing their community-based sessions within three months after completion of the training. Although only 20% of the TTT participants completed the community educational sessions, they impacted 955 community members through their workshops, thus creating a ratio of 41.5 people reached per trained participant. Since lack of information or knowledge about CRC and cancer prevention was a prominent reason cited for a lack of CRC screening, the multiplier effect observed among the participants of the TTT workshops and the community members reached was an important outcome.

The TTT model has been previously used to promote community health education. In a study designed to develop and sustain a national level of nurse educators capable of training future nurses on HIV-related subjects in Vietnam [18], 87 nurse educators trained using the TTT model were able to each train an average of 770 healthcare workers over a 6 years period [18]. Similarly, in a study designed to improve the patient resuscitation skills of isolated doctors, 8 rural, non-hospitalist physicians trained 57 doctors within a 6- and 12-week follow-up period [19]. This indicates a ratio of 7 physicians trained per every doctor trained using the TTT strategy. Both of these studies only used health care workers as the participants trained, resulting in a training pool of healthcare professionals who had significant baseline of knowledge on the subject matter being taught. Participants of the TTT Colorectal Cancer and Prevention workshops were *not required* to have a health background, perhaps contributing to the observed low adherence rate in conducting community sessions.

We found that the TTT program led to increased CRC screening knowledge. In a study conducted at University of North Carolina at Chapel Hill focusing on Latinos with limited English proficiency,

overall CRC knowledge was measured through a 6-question pre- and post-intervention test [11]. The investigators obtained a similar pre-intervention, baseline knowledge score (20%), which increased to 72% post-intervention [11]. The 20% CRC baseline knowledge score in this study was similar to our observed pre-intervention scores of 17.7% among the community participants (Data not shown). The increase in CRC knowledge after the TTT workshops provides strong evidence that the intervention improved the knowledge of the participants. The investigators described an increase in knowledge scores from 20% (pre-) to 72% (post-) for participants in a 14-minute multimedia decision aid that addressed CRC screening rationale, recommendations, and options [11]. This suggests that Latino communities have low baseline knowledge on CRC prevention that can be improved by community-based educational programs.

The Completers described the need for a more tailored intervention, which focused purely on CRC screening benefits with the training adapted for the community's baseline knowledge. These suggestions have been identified in other published studies, highlighting the need for community-specific interventions such as the use of telenovelas or giant inflatable colons to illustrate disease pathophysiology [20,21]. The Non-Completers described the short follow-up time (completion of community session within three months of the TTT workshop) as the main reason why they did not engage in community workshops. In summary, both the completers and non-completers cited complex educational material as a barrier to the delivery of the community sessions.

Several groups have examined simpler methods to improve community education on CRC prevention. In a study conducted in Alaska, a giant inflatable colon was used as an educational tool where participants were surveyed about their CRC knowledge after walking through the interactive model. This study reported that this interactive exhibit improved public knowledge and interest in CRC screening, which may lead to increased CRC screening rates [20]. Another creative tool that could be used to increase CRC knowledge is culturally sensitive and appropriate "telenovela" style movies to disseminate and increase CRC knowledge [21]. Telenovela viewing is common throughout PR and this strategy could ensure higher participation in the community-based training session and a better understanding of CRC.

A higher level of education among participants in the completers compared to the non-completers could be one possible explanation for why participants did not complete the community sessions. It could be that those with the highest levels of education have an advantage in terms of understanding health problems or were less apprehensive about answering questions at community educational sessions. However, a recent study showed that primary care physicians who received patient-centered communication training did not increase cancer screening referral patterns [22]. Therefore, a participant's education level may be a confounder of another independent factor such as previous experiences with the disease or personal reasons that motivate participants to become trainers and promote the message. Several of the TTT participants expressed concern about not being comfortable enough with their knowledge of the material to either create or assist in an educational community session. Possible support systems suggested by the Guide for Community Preventive Services [23] could include: keeping flexible hours for the workshops to ensure the most participation, working in more non-clinical settings that are places for community organization, securing transportation to training sites, or having patient navigators (PNs) present to provide support. A study by the American Cancer Society found that a PN program increased CRC screening rates in a community health center and improved uptake in vulnerable patients [24]. Many CRC screening programs begin by orientation of the vulnerable population resulting in drastic improvements in the participant's CRC screening rates [25-27].

This study was a pilot program examining the use of TTT workshops to increase education and awareness about CRC in a

Hispanic community. Although only 20% of the trainees were able to complete the community sessions, the program impacted close to 1,000 individuals. A possible limitation to consider is that this study relied on self-reports during a three-month follow-up period, introducing the possibility of recall bias. Hence, there could have been additional participants who completed the workshops and were not captured on the current analysis. In order to optimize the completion and impact of the TTT Colorectal Cancer Education Program, a three pronged strategy is proposed: 1) specialization in recruitment of TTT participants; 2) simplification of the educational presentation; and 3) creation of a trainer support group. Further studies examining alternative educational approaches, including use of "expert support groups", aimed at increasing community knowledge in CRC are warranted to reduce screening disparities among Hispanics. Another limitation of the study was that evaluation surveys were collected anonymously, so it not possible to specify the educational background of the Non-Completers. Eighty seven percent (n = 93) of the participants reported having at least a bachelor degree.

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