Original Article

A Physician-Initiated Intervention to Increase Colorectal Cancer Screening in Chinese Patients

Angela Sun, PhD, MPH [1]; Janice Y. Tsoh, PhD[2]; Elisa K. Tong, MD, MA[3]; Joyce Cheng, MS[1]; Edward A. Chow, MD[4]; Susan L. Stewart, PhD [5]; and Tung T. Nguyen, MD[6]

BACKGROUND: Among Chinese American individuals, only approximately 42% of cases of colorectal cancer (CRC) are diagnosed at an early stage, possibly because these patients are less likely than non-Hispanic white individuals to undergo CRC screening. **METHODS:** Primary care physicians (PCPs) were recruited from a local independent practice association serving Chinese Americans and randomized into early-intervention and delayed-intervention groups. PCPs in the early-intervention group received continuing medical education (CME), and their patients received an intervention mailer, consisting of a letter with the PCP's recommendation, a bilingual educational booklet, and a fecal occult blood test (FOBT) kit in year 1. PCPs in the delayed-intervention group received no CME, and their patients received the mailers in year 2. **RESULTS:** A total of 20 PCPs were assigned to the early-intervention and 22 PCPs to the delayed-intervention group. A total of 3120 patients of these participating PCPs who had undergone CRC screening that was due during the study period were included. A total of 915 mailers were sent in year 1 and 830 mailers were sent in year 2. FOBT screening rates increased from 26.7% at baseline to 58.5% in year 1 in the early-intervention group versus 19.6% at baseline to 22.2% in year 1 in the delayed-intervention group ($P<.0001$). The overall effect size of the mailer intervention with or without CME was estimated as a difference of 26.6 percentage points (95% confidence interval, 22.0-31.2 percentage points) from baseline compared with usual care. The intervention was found to have no impact on rates of colonoscopy or sigmoidoscopy. **CONCLUSIONS:** The results of the current pilot study demonstrated that a mailer including educational materials and FOBT kits can increase CRC screening rates with or without CME for the PCPs. ***Cancer* 2018;124:1568-75**. *© 2018 American Cancer Society.*

KEYWORDS: Chinese, colorectal cancer screening, fecal occult blood test (FOBT)/fecal immunochemical test (FIT), physician network, provider initiated.

INTRODUCTION

Chinese Americans are the largest Asian ethnic group, contributing to >20% of the total Asian American population.[1] Cancer is the leading cause of death among Asian American individuals, with colorectal cancer (CRC) being one of the most common fatal malignancies.[2] CRC incidence rates among Chinese American men and women are reported to be 54.0 and 40.2 per 100,000 population, respectively.[3] Although the 5-year survival rate is >90% if CRC is diagnosed at a local stage,[4] only 42% of CRC cases among Chinese Americans are reported to be diagnosed at an early stage.[2]

The US Preventive Services Task Force recommends stool-based tests such as the fecal occult blood test (FOBT) and fecal immunochemical test, sigmoidoscopy, and colonoscopy as screening tests for CRC.[5] However, Asian American and Chinese American individuals are 30% to 50% less likely than non-Hispanic white individuals to participate in CRC screening.[6,7] Barriers associated with low rates of CRC screening among Chinese Americans include lower educational attainment, limited English proficiency, recent immigration and lower acculturation, lack of health insurance,[8] lack of physician recommendation,[9] fear of abnormal results, and lower perceived susceptibility.[10] Additional barriers to CRC screening among Asian Americans include lack of knowledge, language, transportation, time,[8] and patient-physician language discordance.[11]

Corresponding author: Angela Sun, PhD, MPH, Chinese Community Health Resource Center, 728 Pacific Ave, Ste 115, San Francisco, CA 94133; angelas@chasf.org

[1]Chinese Community Health Resource Center, San Francisco, California; [2]Department of Psychiatry, University of California at San Francisco, San Francisco, California; [3]Department of Internal Medicine, University of California at Davis, Sacramento, California; [4]Jade Health Care Medical Group, San Francisco, California; [5]Department of Public Health Sciences, University of California at Davis, Davis, California; [6]Division of General Internal Medicine, University of California at San Francisco, San Francisco, California

Special thanks to Stephen J. McPhee, MD, for his critical role in conceiving this pilot study and its design as well as overseeing implementation of the study.

The articles in this Supplement were presented at the National Center on Reducing Asian American Cancer Health Disparities (also known as the "Asian American Network for Cancer Awareness, Research, and Training–AANCART") meeting held in August 2017. The organizational entities that comprise AANCART included the University of California, Davis Comprehensive Cancer Center (Lead); University of California, San Francisco; University of California, Los Angeles; University of Hawaii; Chinese Community Health Organization; and Hmong Women's Heritage Association.

This supplement was funded in part through a cooperative agreement grant funded by the National Cancer Institute's Center to Reduce Cancer Health Disparities under grant 3U54 CA153499.

DOI: 10.1002/cncr.31287, **Received:** August 28, 2017, **Revised:** January 4, 2018; **Accepted:** January 25, 2018, **Published online** March 22, 2018 in Wiley Online Library (wileyonlinelibrary.com)

Continuing medical education (CME) has been used as an educational strategy to change physician performance in their patients' healthcare outcomes.[12] Studies have demonstrated that physician involvement in health promotion can influence patient health decision making and behavior.[13] CRC screening rates have been shown to increase when the physician's and patient's language is in concordance.[11] Many physicians who are in solo practice or work in small groups may join an individual practice association (IPA). Such networks can bring these physicians together to deliver quality population-based care.[14] The objective of the current pilot study was to assess the efficacy of an intervention initiated by a physician network that included CME and mailed CRC information and a FOBT kit to increase CRC screening rates among Chinese American individuals.

MATERIALS AND METHODS

Academic-Community-Clinical Partnership

The pilot study was designed and implemented by partners within the San Francisco site of the Asian American Network for Cancer Awareness, Research, and Training (AANCART). The clinical partner was the Chinese Community Health Care Association (CCHCA), a nonprofit IPA established in 1982 that provides San Francisco residents with culturally competent health care through its network of >200 physicians serving primarily Chinese patients. The partnership also included academic researchers from the University of California at San Francisco and a community organization, the Chinese Community Health Resource Center (CCHRC), a nonprofit community-based organization that works closely with the CCHCA to provide educational programs and services to their patients. The CCHCA and CCHRC are part of the Chinese Hospital Health System, which also includes a community-based hospital and the Chinese Community Health Plan, a health insurer. For the current study, the Chinese Hospital Health System clinical laboratory conducted the CRC screening test analysis.

Study Population, Eligibility Criteria, and Enrollment

Primary care physicians (PCPs) were recruited from the CCHCA to participate in the current study. The physicians were specialists in family practice, general practice, and internal medicine. Within the CCHCA, there were 61 PCPs, 54 of whom were eligible because they had at least 1 eligible patient who was due for CRC screening during the intervention period from October 2007 to December 2009. A trained research staff member from the CCHRC visited each eligible PCP to explain the logistics of study participation. Of the 54 eligible PCPs, 12 refused to participate, resulting in 42 participating PCPs (78% participation rate). In addition, the CCHRC obtained a list of potential eligible patients from the CCHCA and verified their eligibility with their enrolled PCPs. Eligibility criteria for patients were: current member of the Chinese Community Health Plan; aged 50 to 75 years; having an estimated life expectancy of ≥10 years; and not being up to date with CRC screening (no FOBT within 1 year, sigmoidoscopy within 5 years, or colonoscopy within 10 years) from September 2006 through December 2009, a study period during which CRC screening receipts were included in the analyses. The study protocols were approved by the institutional review board at the University of California at San Francisco.

Study Design

The randomized controlled pilot trial was conducted at the CCHCA with participating PCPs, and their eligible patients were randomized into 2 groups: the early-intervention and the delayed-intervention groups. In the early-intervention group, PCPs received 3 CME seminars (2005-2008) regarding CRC, and their eligible patients who were due to undergo CRC screening during year 1 received a mailer intervention packet in year 1 of the study (October 2007-October 2008). PCPs assigned to the delayed-intervention group did not receive CME regarding CRC but their patients who were due to undergo CRC screening in year 2 received the mailer packet in year 2 (December 2008-December 2009). In addition, all patients received usual care by their PCPs during the study period. During the time of the study, the CCHCA's usual care for CRC screening consisted of PCPs advising their patients aged >50 years to complete 1 of the recommended CRC screenings.

Sample Size Justification

The sample size estimation of the trial was based on the precision of the estimates. Conservatively assuming that the probability that a PCP's patients will receive a particular CRC screening test varies uniformly between 0 and 1, the standard error of the percentage of patients who receive the test in a group of 20 PCPs is approximately 0.07. We considered a sample size of 20 participating PCPs per treatment group to provide sufficiently precise estimates for the pilot trial.

Theoretical Framework, Intervention Components, and Implementation

Theoretical framework

The intervention components affect different levels of the socioecological context, as reflected in the Health Behavior

Framework,[15] an integrative conceptual model. At the individual level, CRC screening knowledge and communication with the provider, in a culturally sensitive manner, were addressed through a bilingual letter from the PCP and a CRC booklet that was mailed directly to the patient. At the provider and health care system level, CRC screening structural factors were addressed by including an FOBT kit in the mailing, which could be sent directly back to the laboratory. Provider awareness was addressed in the CME seminars. The intervention design was guided by findings from a survey study of 51 PCPs in solo practices or who were affiliated with the Chinese Community Health Plan in 1995, which support these intervention strategies to help physicians overcome various barriers to increasing CRC screening among their patients.[16]

Intervention components

The intervention consisted of 1 component targeted to PCPs via CME seminars, and the other component targeted to patients in the form of a mailer packet.

Physician-targeted component: CME seminars. PCPs in the early-intervention group received a series of 3 CME seminars between 2005 and 2008. CME seminars for PCPs focused on the national recommendations regarding CRC screenings and treatments. Physicians from the CCHCA specializing in colorectal surgery, gastroenterology, and oncology served as speakers.

Patient-targeted component: mailer packet. The mailer included 6 elements. The first was a bilingual (Chinese and English) letter from the patient's PCP recommending CRC screening. The second element was a bilingual booklet with information regarding CRC, which was adapted from a booklet entitled "A Lay Health Worker Training Guide on Colon Cancer Prevention" published by the Vietnamese Community Health Promotion Project at the University of California at San Francisco and publications from the National Cancer Institute. The CRC booklet covered the following topics: 1) what is cancer; 2) what is CRC; 3) who develops CRC; 4) symptoms of CRC; 5) screening tests for CRC; 6) what happens if a CRC screening test is not normal; 7) treatment of CRC; 8) commonly asked questions and answers; 9) where to get more information; and 10) a summary of key points. The booklet first was developed in English by a CCHRC health educator and then reviewed by PCPs for clinical accuracy. Feedback then was incorporated into the English material and finalized. The final English material was translated into Chinese by an experienced translator. The Chinese translation was set at a sixth-grade reading level and then field tested with a focus group of 8 Chinese individuals from the target age group. The focus group provided feedback regarding the format, content, graphics, color scheme, literacy level, and cultural appropriateness. Their feedback was incorporated into the final Chinese material. A third element of the mailer was a bilingual FOBT specimen instruction sheet provided by the laboratory at the Chinese Hospital Health System to patients receiving an FOBT test kit for CRC screening. The fourth element of the mailer was a Beckman Coulter Hemoccult II SENSA FOBT triple-slide kit (Beckman Coulter Inc, Brea, California) that was prelabeled with the patient's name and date of birth. The fifth element was a completed laboratory order form and the sixth element of the mailer was a preaddressed and prepaid postage return envelope to the Chinese Hospital Health System laboratory, with instructions to return the completed FOBT kit to the laboratory. A copy of the FOBT laboratory result was sent to both the patient's PCP and the patient. Those patients with positive FOBT results were notified to follow up with their PCPs.

Intervention implementation

CME. Between 2005 and 2008, the CCHCA conducted 3 CME seminars regarding CRC screening and treatment in partnership with researchers at the University of California at San Francisco. The objective of the seminars was to raise physician awareness concerning the importance of CRC screening, with an emphasis on FOBT because it is low cost, noninvasive, and performed in the privacy of the patient's home without anesthesia. CME attendance was not mandatory.

Mailer. The CCHCA generated a monthly patient mailing list of those patients due to undergo CRC screening at the time when the list was generated for a randomly selected PCP from the corresponding treatment group (year 1 for the early-intervention group and year 2 for the delayed-intervention group). CCHRC staff obtained the patient list and verified it with enrolled PCPs to confirm patients' eligibility and whether patients could be mailed a mailer packet. The PCP could choose to exclude individual patients from the mailing due to medical or other reasons as deemed appropriate. The CCHRC sent out approximately 150 mailer packets per month to eligible patients from October 2007 through December 2009. During year 1 (October 2007-October 2008), the mailer packets were sent to patients of the PCPs assigned to the early-intervention group. During year 2 (December 2008-

December 2009), the packets were sent to patients of the PCPs assigned to the delayed-intervention group.

Data Source for CRC Screening Rates

The CCHCA provided aggregated data from the PCPs from the electronic medical records. From each PCP, the number of eligible patients due for CRC screening and the number of these eligible patients who had undergone FOBT, colonoscopy, or sigmoidoscopy during each of the 3 study periods were used in the analyses. The 3 study periods were: 1) baseline (September 2006-September 2007); 2) year 1 (October 2007-October 2008); and 3) year 2 (December 2008-December 2009).

Two primary outcome measures, computed at each study period (baseline, year 1, and year 2), were: 1) the percentage of patients receiving FOBT screening among those who were due to undergo CRC screening during the corresponding study period; and 2) the percentage of patients receiving colonoscopy or sigmoidoscopy screening (COLSIG), excluding those patients who underwent FOBT within the same year to avoid counting follow-up tests for a positive FOBT as screening. Because of the small number of sigmoidoscopies performed during the study periods (1 to 2 each study period among all PCPs combined), the screening rate of sigmoidoscopy was combined with colonoscopy.

TABLE 1. CRC Screening Rates of FOBT and COLSIG by Intervention Condition and Study Period

	FOBT	
Study Period	Early Intervention, % (95% CI)	Delayed Intervention, % (95% CI)
Baseline	26.7% (20.1%, 33.3%) Range: 0%-100%	19.6% (12.4%, 26.9%) Range: 0%-44.4%
Year 1[a]	58.5% (49.5%, 67.6%) Range: 0%-92.9%	22.2% (17.9%, 26.6%) Range: 0%-50.0%
Year 2[b]	19.2% (12.3%, 26.2%) Range: 0%-41.2%	36.0% (29.8%, 42.3%) Range: 0%-58.3%
	COLSIG	
Study Period	Early Intervention, % (95% CI)	Delayed Intervention, % (95% CI)
Baseline	10.5% (7.3%, 13.8%) Range: 0%-20.0%	6.0% (2.3%, 9.8%) Range: 0%-15.2%
Year 1[a]	13.2% (10.8%, 15.8%) Range: 0%-35.1%	9.5% (6.5%, 12.5%) Range: 0%-22.5%
Year 2[b]	6.1% (4.4%, 7.9%) Range: 0%-11.1%	3.1% (2.1%, 4.2%) Range: 0%-25.0%

Abbreviations: 95% CI, 95% confidence interval; COLSIG, colonoscopy or sigmoidoscopy; CRC, colorectal cancer; FOBT, fecal occult blood test.
[a] In year 1, the early-intervention group received CRC mailers whereas the delayed-intervention group received usual care.
[b] In year 2, the delayed-intervention group received CRC mailers whereas the early-intervention group received usual care.

Data Analysis

We created generalized linear marginal models using generalized estimating equations with an independent correlation matrix to account for within-PCP correlation of patient responses separately for each of the 2 screening outcomes: 1) receipt of FOBT and 2) receipt of COLSIG.

For each generalized estimating equations model, a binomial distribution of the binary response outcome (test receipt) with an identity link function was used so that the probability of receiving the test was a linear function of treatment group assignment (early-intervention vs delayed-intervention), study period (baseline, year 1, and year 2), and an interaction of treatment group by study period. First, the models were used to estimate the percentage of eligible patients who received FOBT and the percentage who received COLSIG along with their respective 95% confidence intervals in each study period for both treatment groups. These values are reported in Table 1, as well as the minimum and maximum percentage screened per PCP.

We then tested interaction terms to answer our primary and secondary research questions: 1) was CME plus the mailer more efficacious than usual care alone?; and 2) did the mailer-only (without providing CME to PCPs) improve CRC screening when compared with usual care? To answer the first question, we compared the treatment groups with respect to change from baseline to year 1 in FOBT and COLSIG screening rates. To estimate the impact on screening rates with the mailer alone, we compared the delayed-intervention group with the early-intervention group with respect to the difference in screening rates between year 2 and baseline. We then compared the effect sizes of the 2 mailer interventions, and estimated the overall effect size of the mailer intervention with and without CME by averaging the effect sizes of the year 1 and year 2 mailer interventions. If the interaction terms were not statistically significant, we tested the main effects of study period and treatment group. Data were analyzed using the SAS statistical software package (version 9.3; SAS Institute Inc, Cary, North Carolina). Statistical significance was assessed at the .05 level (2-sided).

RESULTS

Participating PCPs, Eligible Patients, and Intervention Delivery

Of the 42 participating PCPs, 20 were assigned to the early-intervention group and 22 to the delayed-intervention group. Of the 20 PCPs in the early-

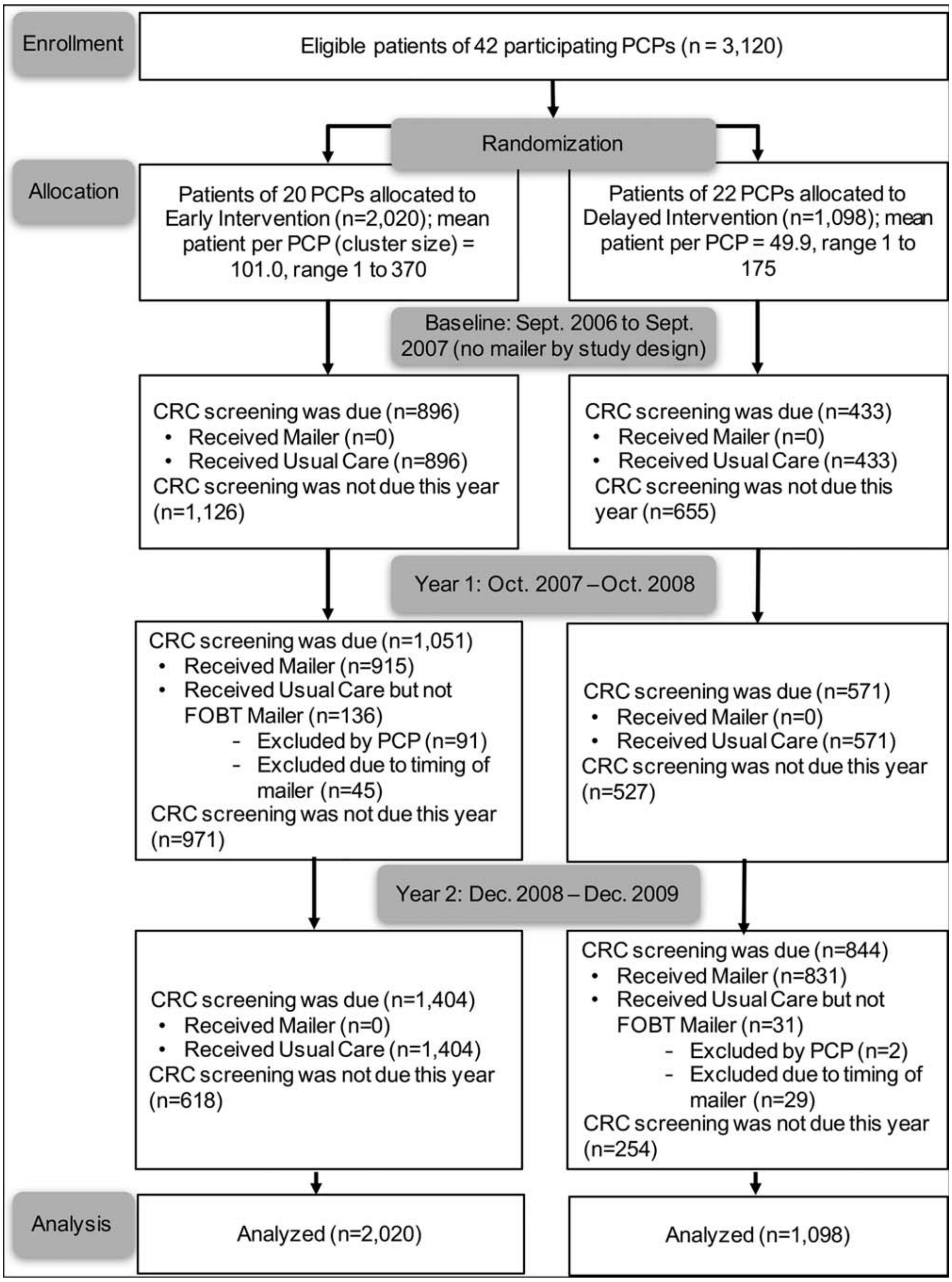

Figure 1. Consolidated Standards Of Reporting Trials (CONSORT) diagram of Chinese American patients in a physician-initiated early intervention and delayed intervention to increase colorectal cancer (CRC) screening. FOBT indicates fecal occult blood test; PCP, primary care physician.

intervention group, 1 PCP did not attend any of the CME seminars. Figure 1 shows the patient flow of the number of eligible patients and the PCPs involved by treatment group at each study period. The total number of eligible, nonduplicate patients who underwent CRC screening that was due during ≥1 of the study periods (baseline, year 1, and year 2) from the 42 participating PCPs was 3120. Among the 20 PCPs assigned to the early-intervention group, the numbers of patients due to undergo CRC screening at baseline, year 1, and year 2 were 896, 1051, and 1404, respectively. Mailer intervention packets were sent to 915 patients of PCPs in the early-intervention group in year 1. Among the 22 PCPs in the delayed-intervention group, the numbers of

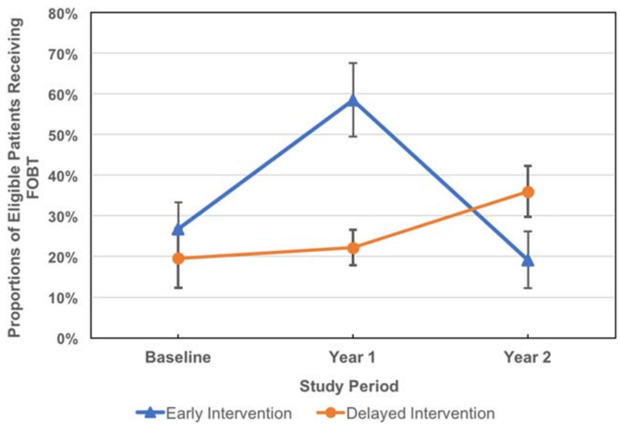

Figure 2. Fecal occult blood test (FOBT) screening rates with 95% confidence intervals shown by treatment groups and study periods.

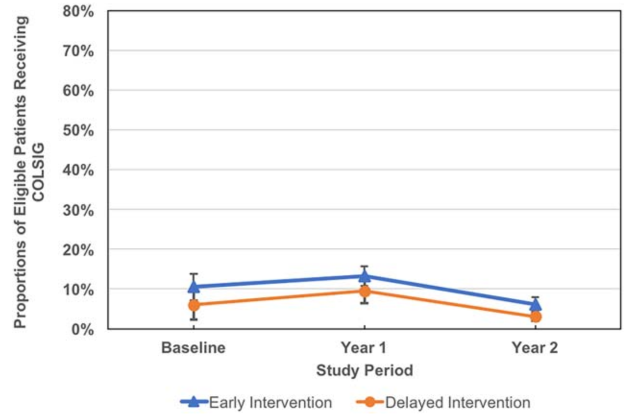

Figure 3. Colonoscopy or sigmoidoscopy (COLSIG) screening rates with 95% confidence intervals shown by treatment groups and study periods.

patients due for CRC screening at baseline, year 1, and year 2 were 433, 471, and 844, respectively. Mailer packets were sent to 830 patients of the PCPs in the delayed-intervention group in year 2. The reasons why some patients who were due for CRC screening did not receive the mailer packet for their corresponding treatment group assignment (year 1 for patients in the early-intervention and year 2 for patients in the delayed-intervention group) were either because their PCP had excluded them from the mailing list due to individual medical situations or other causes, or due to the timing when the mailing list was generated. Some patients who were due for CRC screening already had undergone screening right before the generation of the mailing list or their CRC screening was not due at the time the mailing list was generated (a new patient or an existing patient who became due for screening after generation of the mailing list during the same study year). Therefore, these patients were not sent the mailer.

FOBT Screening

Screening rates for FOBT in each intervention group for each study period are shown in Figure 2 and Table 1. There was substantial variation noted in the screening rates per PCP, ranging from 0% to 100% (Table 1). The change in screening rates from baseline to year 1 was significantly greater in the early-intervention group (increase of 31.8 percentage points) compared with the delayed-intervention group (increase of 2.6 percentage points), a difference of 29.2 percentage points (chi-square, 35.3; $P<.0001$), thereby providing evidence of the efficacy of the CME plus mailer intervention.

The difference in FOBT screening rates between year 2 and baseline was significantly greater in the delayed-intervention group (increase of 16.4 percentage points) compared with the early-intervention group (increase of 7.5 percentage points) at a difference of 23.9 percentage points (chi-square, 23.8; $P<.0001$), thereby providing preliminary evidence that the patient-targeted mailer-only intervention improved CRC screening rates.

The effect sizes of the year 1 and year 2 mailer interventions did not differ significantly (29.2 percentage points vs 23.9 percentage points; chi-square, 0.4 [$P=.54$]), and the overall effect size of the mailer intervention with or without CME was estimated at a difference of 26.6 percentage points (95% confidence interval, 22.0-31.2 percentage points) from baseline compared with usual care.

COLSIG Screening

Screening rates for receiving COLSIG among patients in each intervention group in each study period are shown in Figure 3 and Table 1. Again, there was a substantial variation in screening rates per PCP, ranging from 0% to 35.1% (Table 1). There was no impact of the CME plus mailer intervention (chi-square, 0.1; $P=.80$) or the mailer-only intervention (chi-square, 0.4; $P=.55$) noted on COLSIG screening rates. On average across the 3 study periods, patients in the early-intervention group had higher COLSIG screening rates compared with patients assigned to the delayed-intervention group (chi-square, 4.5; $P=.034$), and there were significant differences noted among the study periods (chi-square, 11.4; $P=.0034$).

DISCUSSION

The current pilot study illustrated a successful partnership among physician network and academic and community-based organizations to implement cancer educational outreach and prevention studies. The results from the first year of the study (year 1) indicated that the intervention, consisting of CME for PCPs combined with a mailer containing a physician letter, a bilingual educational booklet, and an FOBT kit for their patients, increased CRC screening rates compared with usual care among patients of physicians in a Chinese IPA. In the second year of the study (year 2), the delayed-intervention group received only the mailer but no CME. Nonetheless, that group had a larger difference observed with regard to CRC screening between year 2 and baseline compared with the original intervention group of CME plus a mailer, which received only usual care in year 2, suggesting that the mailer was effective even without CME.

One factor that contributed to the successful implementation of the current study was the building of a trusted partnership between academic, community, and clinical entities through the planning of the study. All partners became familiar with each other's operational styles and developed a clear understanding of each partner's responsibilities.

The partnership model not only enabled the research project to be executed but also is a prudent and practical way with which to approach health promotion in diverse communities. Because PCPs, particularly those in small private practices, have limited time and resources, they may not be able to send mailers to or be involved in health promotion activities for their patients. Involving a community-based organization such as the CCHRC in this effort can serve as an educational resource for PCPs. PCPs can leverage the cultural and linguistic expertise of a community-based organization in community outreach, and their capacity to provide health education to improve patients' clinical outcomes.

Another factor that may have led to increased rates of screening was the letter from each patient's PCP encouraging the patient to complete CRC screening. Physicians are held in high esteem in the Asian community and are influential in patients' health care decision making[13]; therefore, the PCP's recommendation and encouragement may have helped the patient to overcome other barriers. Mailing the FOBT kit also addressed logistical barriers by minimizing the time and effort between the time a patient decides to undergo CRC screening and the time when he or she can be screened.

In year 2, when the mailers stopped, the CRC screening rates for the early-intervention group dropped below baseline. However, there was a corresponding increase in screening rates in the delayed-intervention group, which received only the mailer and no PCP received CME, suggesting that the mailer was the more important component of the intervention, and that the mailing needs to be sustained to have a continued effect on CRC screening rates. To achieve the American Cancer Society's CRC screening goal for 2018 of 80% among those aged $\geq$50 years and who are at average risk, changes must be made within the health system along with the provision of education to empower patients. Based on the results from this pilot study, the CCHCA and Chinese Community Health Plan have created a system change to adopt the mailer program as part of an annual CRC screening protocol and preventive education program for their patients that currently is ongoing.

The results of the current pilot study illustrate the power of partnerships in conducting research and improving quality of care in diverse populations, as well as confirm the efficacy of mailing FOBT kits and in-language educational materials along with PCP recommendations for increasing CRC screening rates among Chinese American individuals. Future research could explore how partnerships between researchers, community organizations, and clinical entities can help to address health disparities.

Limitations

The current study did have limitations, including that the intervention was limited to only patients whose PCPs belonged to a physician network, data regarding patients' characteristics were limited, and we were unable to evaluate the efficacy of each component in the intervention mailer packet. We also were unable to quantify the differential effect between the CME and mailer components in the early-intervention group, although the results noted in the delayed-intervention group suggest that the mailer was effective without the CME. One of the strengths of the current study was that the CRC screening rates were validated by clinical service data, rather than self-reported data.

FUNDING SUPPORT

Supported in part by a cooperative agreement from the National Cancer Institute to the National Center for Reducing Asian American Cancer Health Disparities (U54CA153499) and funded in part by the Chinese Hospital Health System. The content of this article reflects the findings of the authors and does not necessarily represent the views of the National Institutes of Health.

CONFLICT OF INTEREST DISCLOSURES

Angela Sun, Joyce Cheng, Edward A. Chow, and Tung T. Nguyen were supported by a grant from the Asian American Network for Cancer Awareness, Research, and Training (AANCART) for work performed as part of the current study. Elisa K. Tong was supported by a grant from the American Cancer Society (RSGT-10-114-01-CPPB) for work performed as part of the current study.

AUTHOR CONTRIBUTIONS

Angela Sun conceived and planned the project, drafted sections of the article, provided conceptual advice and feedback, and edited the article. **Janice Y. Tsoh** co-led data analyses, drafted sections of the article, provided feedback, and edited the article. **Elisa K. Tong** conceived and planned the project, provided feedback, and edited the article. **Joyce Cheng** drafted sections of the article and provided feedback. **Edward A. Chow** drafted sections of the article, provided feedback, and edited the article. **Susan L. Stewart** led and performed data analyses, provided feedback, and edited the article. **Tung T. Nguyen** conceived and planned the project, provided feedback, and edited the article.

REFERENCES

1. US Census Bureau. Facts for Features: Asian/Pacific American Heritage Month: May 2015. https://www.census.gov/newsroom/facts-for-features/2015/cb15-ff07.html. Accessed August 1, 2017.
2. American Cancer Society, California Department of Public Health, California Cancer Registry. California Cancer Facts & Figures 2017. Alameda, CA: American Cancer Society Inc, California Division; 2017. https://www.cancer.org/content/dam/cancer-org/online-documents/en/pdf/reports/california-facts-figures-2017.pdf. Accessed August 1, 2017.
3. Miller BA, Chu KC, Hankey BF, Ries LA. Cancer incidence and mortality patterns among specific Asian and Pacific Islander populations in the U.S. *Cancer Causes Control.* 2008;19:227-256.
4. Vernon SW. Participation in colorectal cancer screening: a review. *J Natl Cancer Inst.* 1997;89:1406-1422.
5. US Preventive Task Force. Final update summary: colorectal cancer screening. https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening2. Accessed August 1, 2017.
6. Liss DT, Baker DW. Understanding current racial/ethnic disparities in colorectal cancer screening in the United States: the contribution of socioeconomic status and access to care. *Am J Prev Med.* 2014;46:228-236.
7. Wong ST, Gildengorin G, Nguyen T, Mock J. Disparities in colorectal cancer screening rates among Asian Americans and non-Latino whites. *Cancer.* 2005;104(suppl 12):2940-2947.
8. Ma GX, Wang MQ, Toubbeh J, Tan Y, Shive S, Wu D. Factors associated with colorectal cancer screening among Cambodians, Vietnamese, Koreans and Chinese living in the United States. *N Am J Med Sci (Boston).* 2012;5:1-8.
9. Yip MP, Tu SP, Chun A, Yasui Y, Taylor VM. Participation in colorectal cancer screening among Chinese Americans. *Asian Pac J Cancer Prev.* 2006;7:645-650.
10. Sun WY, Basch CE, Wolf RL, Li XJ. Factors associated with colorectal cancer screening among Chinese-Americans. *Prev Med.* 2004;39:323-329.
11. Thompson CA, Gomez SL, Chan A, et al. Patient and provider characteristics associated with colorectal, breast, and cervical cancer screening among Asian Americans. *Cancer Epidemiol Biomarkers Prev.* 2014;23:2208-2217.
12. Davis DA, Thomson MA, Oxman AD, Haynes RB. Changing physician performance. A systematic review of the effect of continuing medical education strategies. *JAMA.* 1995;274:700-705.
13. Kreuter MW, Chheda SG, Bull FC. How does physician advice influence patient behavior? Evidence for a priming effect. *Arch Fam Med.* 2000;9:426-433.
14. Casalino LP, Chenven N. Independent practice associations: advantages and disadvantages of an alternative form of physician practice organization. *Healthc (Amst).* 2017;5:46-52.
15. Bastani R, Glenn BA, Taylor VM, et al. Integrating theory into community interventions to reduce liver cancer disparities: The Health Behavior Framework. *Prev Med.* 2010;50:63-67.
16. Lee MM, Lee F, Stewart S, McPhee S. Cancer screening practices among primary care physicians serving Chinese Americans in San Francisco. *West J Med.* 1999;170:148-155.