



Durability of FIT Screening After Cessation of a Screening Outreach Intervention

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Abstract

Introduction Organized outreach to increase CRC screening using mailed FIT tests has been shown to be effective, but durable changes to screening behavior after cessation of screening is not known.

Methods In this study, after cessation of funding for an organized cancer screening outreach program, we evaluated whether adherence to screening remained elevated. Patients aged 50–75 years eligible for CRC screening from eight safety net clinics were randomly assigned to outreach intervention vs usual care alone in 2016 to 2018; the primary outcome analyzed was the difference in the cumulative proportion of completed FIT screening between study assignments 1 year after study cessation.

Results Despite higher rates of FIT screening for patients who were randomly assigned to the outreach intervention, FIT completion was not significantly different between the group that received the outreach services versus the usual care group (28.3% vs 29.8%, $p = 0.158$).

Conclusion Outreach campaigns and their activities must be sustained to maintain improved rates of screening participation.

Keywords Cancer prevention · Colorectal cancer screening · Durability of CRC screening · FIT testing for colorectal cancer screening · Randomized Control Trial

Introduction

Colorectal cancer (CRC) is the 3rd most common malignancy and the 2nd leading cause of cancer death among people in the USA [1]. Despite evidence that has shown that CRC screening is effective in reducing CRC mortality [2], CRC screening is underutilized by the general population and even more so among minority populations and in the safety net [3]. Fecal immunochemical testing (FIT) is increasingly used to support population-level screening [2], specifically organized outreach using mailed (FIT) has been demonstrated to be an effective screening strategy in resource-limited settings and has been increasingly used to improve colorectal cancer population-level screening rates [2–4].

We previously conducted and demonstrated the effectiveness of a multicomponent screening intervention [5]. The study randomly assigned patients to usual care or outreach. The goal of this study was to evaluate whether there are durable changes in adherence to FIT after the cessation of such campaigns.

Methods

This analysis used the data accumulated after the cessation of a larger randomized controlled trial of mailed FIT kits in the San Francisco Health Network (SFHN), a publicly funded safety net health system serving low-income populations [5]. In the original trial (NCT02613260), patients aged 50–75 years who were not up to date with CRC screening were assigned to receive multicomponent screening interventions that included the mailing of a FIT kit and were compared to usual care. Patients aged 50–75 years eligible for CRC screening from eight participating primary care safety net clinics were randomly assigned to outreach intervention vs usual care alone which began in 2016 and ceased in 2018. The intervention included a mailed postcard and

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call, followed by a mailed FIT kit and a reminder phone call if the FIT kit was not returned. Usual care was performed at the provider's discretion and may have included tailored educational materials and coaching.

For this secondary analysis, we identified patients active in the health system 1 year after cessation of the original trial intervention. The primary outcome was the difference in the cumulative proportion of completed FIT screening between study assignments 1 year after study cessation. Comparisons were made using chi-square tests with a p -value less than 0.05 considered statistically significant. This trial was approved by the University of California San Francisco Institutional Review Board (IRB, 14-14861).

Results

Between January 2016 and October 2017, 10,820 patients were enrolled from eight clinic sites; FIT screening was statistically significantly higher in the intervention group ($n = 5434$) than in the control group ($n = 5386$) (57.9% vs 37.4%, $p < 0.001$). The effect of the outreach intervention consistently increased screening participation across all clinical sites and all patient demographic subgroups. Most notably, patients who had previously completed a FIT were more likely to complete a FIT than those with no record of prior FIT completion (70.2% vs 34.8%; $p < 0.001$).

A total of 6,697 individuals (61.9%) remained active in the health system 1 year after cessation of the original study (October 2017–September 2018) of which 3,341 patients had been assigned to the usual care group and 3,356 assigned to outreach. A total of 1948 (29.08%) of these patients completed FIT testing within 1 year of study cessation; however, FIT completion was not significantly different between the group that received the outreach services versus the usual care group (28.3% vs 29.8%, $p = 0.158$). FIT completion was higher for patients who completed FIT during the study compared to those who had not (33.5% vs. 15.4%, $p < 0.001$). Among the patients who completed a FIT test during the study period, FIT completion 1 year after study cessation was lower in the outreach arm compared to the usual care arm (31.9% vs. 35.5%, $p < 0.01$).

Discussion

Although organized outreach significantly improved screening completion rates compared to usual care, the benefit of outreach was nullified after the cessation of the comprehensive FIT outreach program. Patients who received outreach services were no more likely than patients who did not receive FIT outreach to complete FIT screening 1 year after cessation of the outreach program. The outreach campaign

resulted in a larger proportion of patients completing FIT tests during the study period; however, this subgroup of patients with a prior record of FIT completion was less likely to complete the FIT test compared to their respective group in the usual care arm. Altogether, these findings suggest that changes in patient behavior as it pertains to CRC screening are not durably improved through the multicomponent outreach program. Similarly, a patient outreach intervention demonstrated a lack of long-term improvement in cervical cancer screening rates after the intervention had ceased. In this same population, however, a population health outreach program, staffed by trained healthcare staff to identify, and reach out to eligible patients within an outpatient clinical setting, led to durable screening rates [6].

In our study, patients who received FIT outreach services had nominally lower FIT completion after study cessation compared to patients who received usual care. This result suggests that a proportion of patients who were recruited by the outreach service to complete screening may have not otherwise participated in screening in their usual care setting. The heterogeneous group of patients that completed screening during the outreach program, composed of patients who naturally completed screening through their clinic and the subgroup of patients who screened because of the outreach program, became less likely to complete screening without outreach compared to its usual care counterpart. These findings were evident in the subset of patients who completed FIT testing during the study period; once the outreach campaign ceased, they were less likely to continue FIT screening compared to patients who completed FIT testing in the usual care arm.

There are several limitations. A percentage of patients were excluded from the study which limits the generalizability of the results (e.g., homeless, advanced stage cancer, comorbidities). Additionally, these results may not be completely generalizable in the current landscape of telehealth in midst of the COVID-19 pandemic. Currently, patients who are aware of healthcare deficiencies can more readily tap into the health system through patient health portals to identify care gaps and to communicate with their healthcare provider [7]. Moreover, screening programs will continue to evolve by incorporating text reminders and online communication portals [8–10]. Similarly, an outpatient-centered workflow that identifies patients in need of screening and education may be helpful in promoting durable cancer screening efforts, as seen with cervical cancer screening [6]. In conclusion, our results suggest that FIT outreach campaigns will need to be sustained or alternative screening strategies are needed to maintain rates of screening participation.

Author's contribution SB contributed to drafting of the manuscript, analysis, and interpretation of data and statistical analysis. MS

contributed to study conceptualization and design; acquisition of data; analysis and interpretation of data; revision of the manuscript; and study supervision. Writing assistance was provided by SB and MS.

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Data availability The datasets generated and/or analyzed during the current study are not publicly available due to the presence of Protected Health Information (PHI) but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declared that they have no conflict of interest.

Ethical approval Research involving human participants, human material, or human data must have been performed in accordance with the Declaration of Helsinki and was approved by the University of California San Francisco Institutional Review Board (IRB, 14–14861).

Consent for publication Informed consent to participate in the study was obtained from participants (or their parent or legal guardian in the case of children under 16).

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References

1. Siegel RL, Miller KD, Sauer AG et al. Colorectal cancer statistics, 2020. *CA Cancer J Clin*. 2020;70:145–164.
2. US Preventive Services Task Force, Davidson KW, Barry MJ et al. Screening for colorectal cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2021;325:1965–1977.
3. Bretthauer M, Løberg M, Wieszczy P et al. Effect of colonoscopy screening on risks of colorectal cancer and related death. *N Engl J Med*. 2022;387:1547–1556.
4. Issaka RB, Avila P, Whitaker E, Bent S, Somsouk M. Population health interventions to improve colorectal cancer screening by fecal immunochemical tests: a systematic review. *Prev Med*. 2019;118:113–121.
5. Somsouk M, Rachocki C, Mannalithara A et al. Effectiveness and cost of organized outreach for colorectal cancer screening: a randomized, controlled trial. *J Natl Cancer Inst*. 2019;112:305–313.
6. Heidemann DL, Adhami A, Nair A et al. Using a frontline staff intervention to improve cervical cancer screening in a large academic internal medicine clinic. *J Gen Intern Med*. 2021;36:2608–2614.
7. Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Trends in outpatient care delivery and telemedicine during the COVID-19 pandemic in the US. *JAMA Intern Med*. 2021;181:388–391.
8. Balzora S, Issaka RB, Anyane-Yeboah A, Gray DM II, May FP. Impact of COVID-19 on colorectal cancer disparities and the way forward. *Gastrointest Endosc* 2020;92:946–950.
9. Patel S, Issaka RB, Chen E, Somsouk M. Colorectal cancer screening and COVID-19. *Am J Gastroenterol*. 2021;116:433–434.
10. Gupta S, Coronado GD, Argenbright K et al. Mailed fecal immunochemical test outreach for colorectal cancer screening: summary of a Centers for Disease Control and Prevention-sponsored Summit. *CA Cancer J Clin* 2020;70:283–298.

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