Improving Colorectal Cancer Screening Rates in an Urban Community Health Center

A thesis submitted to the University of Arizona College of Medicine – Phoenix in partial fulfillment of the requirements for the degree of Doctor of Medicine

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Abstract

Colorectal cancer (CRC) is a leading cause of cancer-related deaths. Although screening has been shown to significantly reduce mortality associated with the disease, CRC screening rates remain low, especially among many minority groups. The purpose of this study was to determine whether an organized screening regimen improves screening in a community clinic serving patients with low baseline CRC screening rates.

The study was conducted at the Wesley Health Center, a Federally Qualified Health Clinic (FQHC) that serves a predominantly uninsured patient population. Participants were patients aged 50 – 75 years who visited the clinic for routine primary care. A team of clinicians and support staff at the Wesley Health Center developed a systematic CRC screening protocol with interventions tailored for the clinic. Following the implementation of the screening regimen, screening rates among the targeted population were examined over a one-year period and compared to a recent one-year period previous to protocol implementation. The primary outcome was the change in CRC screening rates in the intervention group compared to screening rates prior to implementation of the protocol.

Results of the study showed CRC screening rates of 45.6% over the trial period, as compared to 13.7% prior to screening interventions, a statistically significant difference (p < 0.001). The investigation provides valuable information regarding the use of practical strategies to increase CRC screening in community health care settings.
# Table of Contents

- Introduction and Significance ......................................................................................................... 1
- Material and Methods .................................................................................................................... 4
- Results ............................................................................................................................................. 7
- Discussion ....................................................................................................................................... 9
- Limitations ...................................................................................................................................... 11
- Conclusion ..................................................................................................................................... 13
- References .................................................................................................................................... 14
Figures and Tables

Figure 1 Colorectal Cancer Screening Rates ................................................................. 3
Figure 2 Intervention Protocol for Improved Colorectal Cancer Screening ................. 6
Table 1 Colorectal Cancer Screening Rates Based on Trial Period ............................... 8
Introduction and Significance

Colorectal cancer (CRC) is the second leading cause of cancer-related deaths in men and women combined. Approximately one in 20 individuals will develop CRC in their lifetime.\textsuperscript{1,2} Because CRC grows slowly in a predictable manner, screening for the disease is ideal. The progression from precursor lesion to CRC is a multistep process that takes place over a period of 10 to 15 years. Screening reduces CRC incidence, thereby preventing the morbidity and mortality associated with the unscreened course of the disease.\textsuperscript{3} The USPSTF recommends screening for CRC using fecal occult blood testing (FOBT), sigmoidoscopy, or colonoscopy, in adults, beginning at age 50 years and continuing until age 75 years. There is convincing evidence that screening with any of the three recommended tests reduces colorectal cancer mortality in adults age 50 to years.\textsuperscript{1}

Unfortunately, current levels of CRC screening lag behind other effective cancer screening tests.\textsuperscript{4} Approximately one-third of adults eligible for CRC screening are not up to date with the established screening guidelines.\textsuperscript{5} Additionally, incidence and mortality of colorectal cancer show health disparities, with a disproportionate burden occurring in certain minority populations.\textsuperscript{6} The National Health Interview Survey is used to monitor progress towards Healthy People 2020 targets for cancer screening test use. The initiative has set a goal of 70.5% for CRC screening. Estimates from the survey indicate that only 42% of Hispanics have been screened as compared to 60% of Non-Hispanic whites.\textsuperscript{7} The NHIS data show even lower rates of 20.7% among the uninsured (Figure 1). Proposed barriers to CRC screening have included a lack of awareness about CRC screening among patients and the absence of recommendations to engage in CRC screening by physicians.\textsuperscript{8} Health care providers also report confusion about CRC screening guidelines, limited time, low patient compliance and inadequate organizational support as barriers to screening.\textsuperscript{9}

Interventions to increase screening use can help achieve national screening objectives and may reduce disparities in screening.\textsuperscript{10} Improving the knowledge and attitudes of clinical staff and physicians regarding CRC screening and promoting teamwork amongst health care providers and their patients are necessary steps towards reaching these screening goals.\textsuperscript{11,12}
Interventional strategies including one-on-one education, client reminders, reducing structural barriers, and provider assessment have been shown to effectively increase CRC screening when using FOBT.\textsuperscript{10} Evidence suggests that the adherence rate to CRC screening is generally more important than which screening test is used.\textsuperscript{13}

The Wesley Health Center in Phoenix, Arizona provides care to a predominately Hispanic and largely uninsured patient population in the area, serving approximately 7,000 individuals per year. The health center opened in 2003 and became a FQHC in 2009 through a grant from the American Recovery and Reinvestment Act (ARRA) and HRSA. The clinic offers FOBT/fecal immunochemical testing (FIT) for the majority of its patient population in the targeted age range, as well as colonoscopy referrals for patients with access to the procedure. Although current literature supports interventional strategies to improve CRC screening, there are limited studies that have addressed the effectiveness of these interventions on CRC screening in low-income communities. This study aimed to examine the impact of a CRC screening regimen among the targeted population in this urban community health center setting. We hoped to show an increase in screening rates for this largely preventable disease and looked to measure the results over a one-year period of time. We hope our findings will contribute towards the development of feasible approaches for improving CRC screening rates among regional and national community health centers and clinics. The results of the study will also facilitate future decisions regarding preventive services.
Figure 1 Colorectal cancer screening rates by race, ethnicity, and insurance based on the 2013 National Health Interview Survey (NHIS). Screen up-to-date is defined by USPSTF guidelines by having fecal occult blood test in the last year, sigmoidoscopy in the last 5 years, or colonoscopy in the last 10 years among respondents aged 50 - 75 year.
Material and Methods

Prior to initiating the study, approval to access records and data was obtained from the Wesley Health Center and the University of Arizona. The study was conducted in one Federally Qualified Health Center (FQHC) that serves a mostly minority population in Phoenix, AZ. The study population included patients aged 50 – 75 years over the course of the trial periods. Patients in this age range were selected based on the USPSTF recommendations for CRC screening for average-risk adults.¹

A multidisciplinary team of clinical providers and support staff at the Wesley Health Center was organized to develop a CRC screening protocol. Planning stages for the protocol considered resources, tools and support needed to facilitate successful screening.¹⁴ Several approaches for improving screening were considered, including: patient-flow redesign, patient and provider education; using electronic medical records (EMR) to identify and track patients who require CRC screening; and using prompts to aid physicians in discussing CRC screening with appropriate patients.¹⁵ Previous studies had shown improved results by increasing screening service delivery by providers, increasing community access to screening and increasing community demand for screening.¹⁰ Over a two-month period, the team evaluated interventional strategies along these focus areas and developed a screening regimen tailored for the clinic, including EMR modifications, educational tools for patients and training for providers. A complete detail of the screening interventions can be found in Figure 2.

The screening protocol was initiated with an all-staff presentation that included CRC education and the importance of screening. The presentation described the interventional strategies targeted by the team along with screening goals for the target population. The trial period was set for August 1, 2013 – July 31, 2014. Per the CRC screening protocol, eligible patients (ages 50 – 75 years, with no documented FOBT in the past year or colonoscopy in the past 10 years) were to be offered screening. Efforts to improve screening service delivery included updates to the EMR that produced automated prompts about CRC screening status in the provider template. The alert was designed to appear in the “cover sheet” that all providers view for each encounter along with the patient problem list and vital signs to draw attention more
readily. The study team also worked with the patient care team to standardize patient navigation and one-on-one patient education to improve compliance following screening orders, including distribution of culturally sensitive CRC screening brochures. Patient education and FOBT/FIT screening kit distribution were to take place in a designated area by select staff. The clinic transitioned to a “one sample” FOBT/FIT screening test prior to the interventional phase to support patient acceptability. Finally, prepaid postage for FOBT/FIT sample returns were to be distributed to patients who indicated difficulty with transportation. These strategies were assessed quarterly by the study team over the course of the trial period. Midway through the trial year, there was a follow-up staff presentation to discuss progress and possible modifications to the interventions.

Following implementation of the CRC screening protocol, screening rates among the targeted population were examined over a one-year period and compared to a recent one-year period previous to protocol implementation. The comparison period was established as January 1, 2012 – December 31, 2012. Data collection and analysis were conducted in 2015. An electronic chart review was completed to determine the number of unduplicated patients between the ages of 50 and 75 who visited the clinic for any reason over the study periods along with the number of CRC screening tests results. Chi-square distribution was used to compare CRC screening rates over the trial period to CRC screening rates prior to interventions.
Figure 2 Intervention protocol for improved CRC screening among patients aged 50 - 75 years within the Wesley Health Center.

- **Increasing Screening Service Delivery by Providers**
  - CRC screening education for providers
  - Automated EMR-based screening status prompts
  - Provider assessment and feedback

- **Increasing Community Access to Screening**
  - “One sample” FOBT/FIT screening
  - Prepaid postage for FOBT/FIT screening returns

- **Increasing Community Demand for Screening**
  - One-on-one patient education
  - Culturally sensitive CRC screening brochures
Results

Our chart review showed that 1,332 unduplicated patients between the ages of 50 and 75 utilized the services provided by the clinic between the dates of January 1, 2012 and December 31, 2012. Of these patients, 183 were screened for CRC by FOBT or colonoscopy for a screening rate of 13.7%. A review of the intervention period revealed that 1,239 unduplicated patients between the ages of 50 and 75 utilized the services of the clinic between the dates of August 1, 2013 and July 31, 2014. Of these patients, 566 were screened for CRC by FOBT or colonoscopy for a screening rate of 45.6%. The difference in screening rates was found to be statistically significant (P < 0.001) with an unadjusted odds ratio (OR) of 5.3 (Table 1).
Table 1  CRC screening based on trial period among targeted patients presenting to the Wesley Health Center for routine primary care.

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<tbody>
<tr>
<td>Total patients (50 – 75)</td>
<td>1,332</td>
<td>1,239</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total # of patients screened</td>
<td>183</td>
<td>566</td>
<td></td>
</tr>
<tr>
<td>CRC screening rate</td>
<td>13.7%</td>
<td>45.6%</td>
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$^1$P-Value calculated using $\chi^2$
Discussion

While CRC screening rates have improved in the United States in recent years, some subgroups of the population are falling far short of national screening targets. Specifically, underserved populations such as racial/ethnic minorities, the uninsured and recent immigrants have experienced large screening disparities. The Wesley Health Center has experienced even lower screening rates among its largely Hispanic and uninsured patient population in recent years. The results of our study show that a set of interventions for improved CRC screening rates can produce significant improvements in screening compliance among patients. The screening rate change from 14% to 46% was statistically significant and indicates that patients were five times more likely to be screened with the interventions than without those measures.

Findings from our project provide support to a growing set of studies examining strategies for improved CRC screening among underserved populations. The interventions implemented in our program were chosen based on financial and labor feasibility. Providing education about the importance of CRC screening to the entire patient care team at the onset of the trial addressed many of the provider-based barriers to screening in a cost-effective manner. Similarly, minor adjustments to the EMR allowed providers to identify and order screening more easily for unscreened individuals during patient encounters. Strategies, such as patient education, were designed to occur within the framework of typical patient navigation.

The Coalition to Boost Screening among the Underserved in the United States is a diverse group of advocates for CRC control and prevention. The group promotes the message, “the best test is the one that gets done”, emphasizing the importance of CRC screening regardless of modality. They argue that single modality approaches such as promotion of colonoscopy alone for CRC screening may not be feasible on a national level with current capacity and may also ignore preferences of underserved populations. While we did not examine these larger issues in our study, we can agree that efforts are needed to identify unscreened individuals and to provide access to screening completion. Although resource-limited health centers may have difficulty developing robust outreach programs to improve CRC screening, efforts directed at patients presenting to the clinic for routine or acute care can be more feasible. Many of the
interventions in our trial were provider-dependent and our results illustrate the impact of simply discussing and ordering screening for eligible patients. Finding multiple approaches to consistently reach this group is critical. Along these lines of developing system-based interventions, one study achieved improved CRC screening rates by offering FOBT for eligible patients while discussing yearly influenza vaccinations. A combination of these strategies, that occur within the framework of routine care, are more likely to achieve sustainable results.
Limitations

Our study had several limitations. First, we implemented a number of different interventions over the trial period. As opposed to randomizing individual interventions to the patient population, all of the strategies were employed and available to the entire target population over the trial period. Based on this study design, we are unable to isolate the impact of individual interventions on screening rates. This format makes it difficult to discern which strategies may be most beneficial to continue or worth implementing in similar health care settings. Given these limitations, we aimed for cost and labor effective strategies that could be universally applied across many clinics. We also declined to randomize our screening regimen to patients over the same trial period. Many of our interventions were system modifications, such as changes to the EMR, that had to be applied universally. We also felt interventions would be applied more consistently if used universally with all eligible patients.

Our study also focused on so-called “in-reach” interventions that engage patients at the point of routine medical care as compared to outreach strategies to promote screening regardless of scheduled health-care visits. One would expect a more robust screening regimen by employing strategies from both modalities. Prior to initiating the trial period, we had developed a partnership with a community health navigator program that aimed to recruit and educate eligible patients about CRC screening. As part of the program, patients were to be directed to the clinic for screening and would receive patient navigation support to ensure completion. Unfortunately, the program was never launched over the trial period.

As part of the analysis process, we had hoped to examine patient compliance among the target population by comparing screening order rates by providers to the rates of screening completion. During the data collection process, results showed higher screening results by FOBT or colonoscopy than actual screening orders. The discrepancy appears to result from the number of different ways that CRC screening can be ordered making capturing all CRC screening orders challenging. Again the vast majority of patients at the Wesley Health Center are offered FOBT as the CRC screening modality, a test that requires considerable patient compliance for completion. As compared to cervical cancer screening tests, which are collected
and ordered by providers during patient encounters, FOBT-based CRC screening kits are completed independently at home. Examining patient compliance in this study would have allowed some insight into future interventional consideration. If tests were being ordered at a high rate among the target population, yet return rates were much lower, greater emphasis could be placed on interventions such as one-on-one education and patient reminders. Alternately, focus could be placed elsewhere if return rates had been high.

Finally, although the USPSTF recommends FOBT as one of the effective screening modalities for CRC, the test must be used yearly to be effective. While the screening rate improved significantly over the trial period, the patient population is often transient in nature and may not benefit from screening access in following years. Accordingly, a screening regimen that relies heavily on FOBT needs to consider strategies that promote routine participation among the target population, regardless of location. As part of this process, the clinic should consider educating underinsured, low-income adults about programs offering free and low-cost screening.
Conclusion

The study demonstrates that the implementation of a CRC screening protocol has produced significant improvements in screening among the target population served by the Wesley Health Center. Continued efforts are needed to reduce disparities locally and nationally to achieve the Healthy People 2020 cancer screening targets. CRC screening saves lives. We join a growing group of health care providers and patient advocates in our support towards closing the gaps in access to appropriate screening. We believe that continued focus on evidence-based interventions and health care system changes will improve CRC morbidity and mortality among underserved populations and the country as a whole.
References


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