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Effectiveness of a primary care practice intervention for increasing colorectal cancer screening in Appalachian Kentucky

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ABSTRACT

Objective. This report describes findings from a randomized controlled trial of an intervention to increase colorectal cancer (CRC) screening in primary care practices in Appalachian Kentucky.

Methods. Sixty-six primary care practices were randomized to early or delayed intervention groups. The intervention was provided at practices using academic detailing, a method of education where providers receive information on a specific topic through personal contact. Data were collected in cross-sectional surveys of medical records at baseline and six months post-intervention.

Results. A total of 3844 medical records were reviewed at baseline and 3751 at the six-month follow-up. At baselines, colonoscopy was recommended more frequently (43.4%) than any other screening modality, followed by fecal occult blood testing (18.0%), flexible sigmoidoscopy (0.4%), and double-contrast barium enema (0.3%). Rates of documented screening results were higher for all practices at the six-month follow-up for colonoscopy (31.8% vs 29.6%) and fecal occult blood testing (12.2% vs 11.2%). For early intervention practices that recommended screening, colonoscopy rates increased by 15.7% at six months compared to an increase of 2.4% in the delayed intervention practices ($p = .01$).

Conclusions. Using academic detailing to reach rural primary care providers with a CRC screening intervention was associated with an increase in colonoscopy.

Introduction

Appalachia has long been a region associated with significant health disparities (Lengerich et al., 2006). Fifty-four of the 120 counties in Kentucky are designated as Appalachian and the socioeconomic indicators for these counties are considerably lower than those for Kentucky as a whole, and the overall health outcomes are decidedly poorer (Friedell et al., 2010). Appalachian populations experience some of the highest cancer mortality rates in the nation, and lack of cancer screening has been identified as one of the most significant contributing factors (Shell and Tudiver, 2004). Research suggests that only 44% of rural Appalachians in Kentucky obtained colorectal cancer (CRC) screening as recommended by guidelines (Kelly et al., 2007). To reduce the burden of cancer in Appalachia, barriers to cancer screening must be identified and best practices to address such barriers must be developed (Scarinci et al., 2010). The purpose of this report is to describe findings from a randomized controlled trial designed to increase CRC screening by providing an intervention to primary health providers in Appalachian Kentucky.

While access to CRC screening in Appalachian Kentucky has increased over time, mortality rates have remained higher than the non-Appalachian areas of the state and screening rates remain low (Davis et al., 2006). Limited access to health care, limited financial resources, and lack of educational attainment are recognized barriers to obtaining healthcare overall and CRC screening in particular for Appalachian populations (Kelly et al., 2007; Lengerich et al., 2006; Scarinci et al., 2010). Personal barriers to colorectal screening include fear, embarrassment, financial issues, lack of ability to recognize need, and inadequate health literacy skills, among others (Curry et al., 2011; Davis et al., 2001; Kelly et al., 2007). One of the most important barriers that stands out from the personal barriers to CRC screening is lack of provider recommendation, a barrier which is not controlled by patients who are in need of the screening (Curry et al., 2011; Kelly et al., 2007). Receiving a recommendation for screening from a physician has been identified as a primary predictor of patient compliance with screening recommendations (Curry et al., 2011). Yet, even physicians and medical staff report that

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procedural issues are a barrier to recommending screening to patients (Kelly et al., 2007).

To improve CRC screening in this high risk population, an intervention focusing on primary health care providers was developed. The decision to focus on primary health care providers instead of patients or the general public arose from results of interactions with a wide array of partners including community members, representatives from worksites, school personnel, public health department workers, CRC survivors, and health care providers (Hatcher et al., 2011). The input from these partners strongly suggested that efforts to increase screening should begin with health care providers because their recommendation is one of the key reasons that patients would obtain screening (Brenes and Paskett, 2000; Klabunde et al., 2005; Wackerbarth et al., 2007; Wee et al., 2005). This project was reviewed and approved by the Institutional Review Board of the University of Kentucky and is registered with the National Cancer Institute # NCI-2013-00753.

Methods

The intervention for primary health care providers was developed for delivery by academic detailing. Academic detailing is a highly adaptable method of education where physicians are instructed through personal contact with an individual or group focused on a specific topic (Albert et al., 2004; Gorin et al., 2006; Soumerai and Avorn, 1990). This method was selected because of the rural locations of the primary health care providers and their limited time for continuing education. The intervention included four modules that addressed the following topics: screening efficacy, clinical performance measures, patient counseling, and creating a screening-friendly practice environment. The screening efficacy module covered the burden of CRC, risk factors, and the advantages of possible screening modalities (hs-FOBT, FS, DCBE, and colonoscopy). The clinical performance measures module presented information on methods used to collect performance data and why practices would choose to measure clinical performance. The patient counseling module discussed the relative effectiveness of different communication strategies on adherence to screening and strategies to overcome patient fears and perceived barriers to screening. The screening-friendly practice environment module presented tools to identify patients who need screening and how to encourage patients to follow-up with recommended screening. The modules were produced as powerpoint presentations and were pilot tested in 12 primary care practices in the study area prior to implementation of the study. Three individuals were recruited and trained in academic detailing to present the modules and answer questions. The modules were then presented in face-to-face visits at the practices. Individuals who knew the local community well and were familiar with primary care practices were selected to deliver the intervention.

Evaluation design

A repeated cross-sectional group-randomized or 'cluster-randomized' design was adopted, where the units of randomization were the primary care practices, and the units of analysis, which were nested within the practices, were the medical records that were to be abstracted by our trained reviewers. A total of 66 practices were enrolled and 33 were assigned at random to an 'early' intervention group. The remaining 33 practices were assigned to a 'delayed' intervention group. Baseline medical record review was completed for all practices prior to randomization and then the 'early' group received the academic detailing intervention. The 'delayed' group received no treatment. Six months after the intervention was delivered, medical record reviews were repeated at each practice. Shortly after the six-month record review, the 'delayed' group practices were offered the academic detailing intervention.

Practice recruitment and enrollment

Primary care practices including general practice, family practice, and general internal medicine were eligible to participate in the project. Potential practices were identified in collaboration with the regional Area Health Education Centers (AHECs) serving the study area. The AHECs provide continuing medical education and student placement services and have up-to-date information on medical practices in their catchment areas. Eligible practices had to have been in operation for at least one year, been seeing patients on a regular basis, and not planning on moving or closing for at least two years. All of the practices on the lists were then contacted by telephone, eligibility criteria were confirmed, the project was described and enrollment was offered. Practices who agreed to consider participation were visited by AHEC staff where additional information about the project was provided, informed consent was obtained, and a survey of the practice was conducted.

Measurement and data collection

Medical record reviewers, who were trained abstractors from the academic institution conducting the project, visited the practices and collected data by abstracting medical records for patients age 50 and older without a previous diagnosis of CRC or Irritable Bowel Syndrome and who had been seen in the practice in the previous 60 days for a non-acute reason. Patients presenting with rectal bleeding were excluded. Documentation of physician recommendations for patients to obtain screening, as well as documentation of results, was obtained for FOBT, FS, DCBE, and colonoscopy. Records were selected for review using sequential lists of patients seen in the practice and continued until reviews of 60 records at each practice were completed.

Research design

This repeated cross-sectional group-randomized intervention project was designed to provide at least 80% power to detect absolute differences in screening recommendations (having at least one of the four screening modalities recommended in the medical record) at the six-month interval of 10–15%. To achieve this design objective, 66 practices were to be enrolled, and no less than 60 patient medical records were to be reviewed from each practice at three points in time; baseline (upon randomization), six months after the intervention, and 18 months after the intervention. The 'intervention' effect comparison was conducted based on record review results collected six months after the intervention was delivered. Given that this was a group-randomized design where the practice represents the cluster and each record nested within time period represents the cluster elements (and unit of analysis), intra-class correlations become relevant and were accounted for both in the design (ICC values that ranged from 0.10 to 0.15 were assumed and used in the power calculations) and the statistical analysis ultimately performed (in this case, the ICC values were estimated using each outcome).

Statistical methods

Estimates of the effects of the intervention were constructed from a statistical model employing logistic regression for repeated cross-sectional binary outcomes and using generalized estimating equations (GEEs) to obtain estimated intervention effect p-values (Ukoumunne and Thompson, 2001). An exchangeable correlation was modeled between the response at baseline and the six month follow-up. The underlying model that was estimated for each outcome is given by

$$\log it\left(\pi_{jkt}\right) = \mu + \alpha G_k + \gamma X_t + \delta(GX)_{kt} + \beta_1 R_0 + \beta_2 R_1 \quad (1)$$

where π_{jkt} is the probability of observing any of the screening tests recommended or test result documented, $(Y_{ijkt} = 1)$, on a medical record (most generally the ith record in the jth practice belonging to the kth intervention group ($k = 1$ for delayed, $k = 2$ for early intervention) at time x_t ($=0$ at baseline, $=1$ at 6 months). G_k is an indicator for whether the ith record reviewed in the jth practice was an early ($=0$) or delayed ($=1$) intervention practice. R_0 is an indicator for whether the ith record in practice j was reviewed at a practice in the Northeast AHEC region ($=1$) or not, and R_1 is defined similarly for Southeastern AHEC region ($=1$). This notation implies that a record was reviewed at a practice in the Southern AHEC region when $R_0 = R_1 = 0$. The intervention effect in Eq. (1) corresponds to the group by time interaction term. This effectively translates into assessing whether the change from baseline to six months differs between the two intervention groups. The associated resultant p-value of the estimate for this term provides the strength of any intervention effect. An analysis of variance method was used to estimate intra-class correlations induced by the next of records at varying time points within a practice (Hade et al., 2010). An a-priori two-sided significance level was set to 5% for all statistical hypotheses conducted.