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Review Article

Have we increased our efforts to identify strategies which encourage colorectal cancer screening in primary care patients? A review of research outputs over time

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ABSTRACT

Globally, colorectal cancer (CRC) screening rates remain suboptimal. Primary care practitioners are supported by clinical practice guidelines which recommend they provide routine CRC screening advice. Published research can provide evidence to improve CRC screening in primary care, however this is dependent on the type and quality of evidence being produced. This review aimed to provide a snapshot of trends in the type and design quality of research reporting CRC screening among primary care patients across three time points: 1993–1995, 2003–2005 and 2013–2015.

Four databases were searched using MeSH headings and keywords. Publications in peer-reviewed journals which reported primary data on CRC screening uptake among primary care patients were eligible for inclusion. Studies meeting eligibility criteria were coded as observational or intervention. Intervention studies were further coded to indicate whether or not they met Effective Practice and Organisation of Care (EPOC) study design criteria.

A total of 102 publications were included. Of these, 65 reported intervention studies and 37 reported observational studies. The proportion of each study type did not change significantly over time. The majority of intervention studies met EPOC design criteria at each time point.

The majority of research in this field has focused on testing strategies to increase CRC screening in primary care patients, as compared to research describing rates of CRC screening in this population. Further research is needed to determine which effective interventions are most likely to be adopted into primary care.

1. Introduction

Globally, colorectal cancer (CRC) is the third most diagnosed cancer and the fourth most common cause of cancer death (Ferlay et al., 2013). CRC screening recommendations are reported in clinical practice guidelines in the developed world and include FOBT, sigmoidoscopy and colonoscopy (Australian Cancer Network Colorectal Cancer Guidelines Committee, 2005; European Commission, 2010; U.S. Preventive Services Task Force, 2008). Population-based CRC screening programs are recommended by the World Health Organisation (Wilson & Jungner, 1968) and several developed nations have implemented population-based screening (Benson et al., 2007). Reported CRC screening rates within these programs are suboptimal, ranging from 7% to 68% (Klabunde et al., 2015). This highlights the urgent need to find effective strategies to increase participation in CRC screening. There is increasing interest in the role of primary care providers (PCPs) to encourage participation in screening. Clinical practice guidelines suggest that PCPs provide risk-appropriate CRC screening advice (Australian Cancer Network Colorectal Cancer Guidelines Committee, 2005; European Commission, 2010; Sarfaty, 2008) and PCPs have a high-level of contact with those in the target age range for CRC screening (Britt et al., 2015).

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1.1. Research type and quality as an indicator of progression of the field

Published research can provide evidence to improve CRC screening in primary care, however this is dependent on the type and quality of evidence being produced. Observational research can provide prevalence data as well as factors associated with an outcome (Theise, 2014). Intervention research that has both internal and external validity can provide data to support causal inferences (Theise, 2014). Exploring the relative effort directed toward observational versus intervention research may help to inform future research directions. For example, if there is a dearth of research of any type, then the field may wish to focus on observational research in order to provide a base for subsequent intervention studies. If there is a predominance of observational research then it may be timely to consider whether efforts would better be focussed on intervention research.

The quality of intervention studies should also be considered. The quality of evidence generated by intervention studies is, in part, determined by the type of experimental design used. The Cochrane Effective Practice and Organisation of Care (EPOC) group specify four study designs which provide robust evidence of effectiveness for interventions: randomised control trials (RCTs), controlled clinical trials (CCTs), interrupted time series (ITS) and controlled before after studies (CBAs) (Cochrane Effective Practice and Organisation of Care Review Group, 2002). Results produced from studies using these designs are less likely to be susceptible to biases, including selection bias and confounding, than those produced from studies using other types of designs (Theise, 2014). While many criteria can be used to comprehensively assess methodological quality, research design provides an initial indicator of research quality.

Clinical practice guidelines report recommendations based on a hierarchy of evidence, with RCTs second only to meta-analyses and systematic reviews (Australian Cancer Network Colorectal Cancer Guidelines Committee, 2005; European Commission, 2010; Guyatt et al., 2015; Royal Australian College of Physicians, 2016). As such it might be expected that the scientific community has increased their research efforts over time from predominantly observational research to high-quality intervention research to inform evidence-based practice.

2. Aims

To examine across three time-points (1993–1995, 2003–2005 and 2013–2015), changes in:

- The proportion of observational and intervention research;
- The proportion of intervention studies that used an EPOC-accepted study design.

3. Methods

3.1. Literature search

Medline, Embase, The Cochrane Library and PSYCINFO databases were searched to identify studies reporting on CRC screening in primary care settings. A start point of 1993 was chosen for the following reasons: 1) Two landmark publications providing evidence that repeated screening with FOBT decreased mortality and that polypectomy via colonoscopy effectively prevented progression of polyps to CRC were published in 1993 (Mandel et al., 1993; Winawer et al., 1993); 2) the earliest mass CRC screening programs commenced in 1992–1993 (Benson et al., 2007). As the purpose of the review was to examine trends over time in the type of research, we examined all relevant publications for three time-points over the past twenty years: 1993–1995 (time point 1), 2003–2005 (time point 2) and 2013–2015 (time point 3).

The following search themes were combined: colorectal cancer, screening and primary care (for full search strategies for each database see Appendix 1). Reference lists of relevant articles were also manually searched to identify additional publications meeting inclusion criteria. The search was limited to include only English language publications and publications with an adult population.

3.2. Inclusion and exclusion criteria

All retrieved titles and abstracts were examined for relevance following removal of duplicates.

Publications were eligible for inclusion if they: 1) reported primary data on rates of CRC screening (any form) among primary care patients and used either; a) an observational study design, or; b) an intervention study design where CRC screening was a primary outcome; 2) were conducted either in the primary care setting or using primary care infrastructure/systems, such as electronic patient records; 3) included a sample aged ≥50; 4) were published in a peer-reviewed journal in the years 1993–1995, 2003–2005, 2013–2015; 5) were published in English; 6) had a full manuscript available. Publications that reported on mixed screening for a range of different conditions were included if results for CRC screening were reported separately. Publications that reported on a sample recruited from a variety of settings were included if the outcomes for the primary care sample were reported separately.

Publications were excluded if they: 1) involved participants who had a previous history of CRC, inflammatory bowel disease or those with hereditary disease such as Lynch syndrome or FAP, as people diagnosed with these diseases are at increased risk of CRC when compared to the general population and have differing CRC screening recommendations; 2) reported diagnostic procedures (symptomatic testing); 3) relied on PCP estimates of CRC screening rates; 4) were dissertations, commentaries, book reviews, reports, reviews, case studies, editorials, letters to the editor or conference proceedings.

3.3. Data coding

Publication titles and abstracts were initially assessed against the eligibility criteria by one author (ND) and excluded if the study did not meet inclusion criteria. A secondary screen of the abstracts by the same author led to additional publications being excluded. The full texts of the remaining publications were assessed for eligibility. A random subsample of 20% of full text publications were assessed against the inclusion criteria by another author (EM), with any discrepancies resolved via discussion.

All publications meeting the eligibility criteria were categorised according to whether they were: 1) observational studies which reported prevalence of CRC screening among primary care patients; or 2) intervention studies to assess the effectiveness of behavioural interventions to increase CRC screening among primary care patients. Intervention studies were further coded according to whether they met one of the four EPOC design criteria: RCTs, CCTs, CBAs, and ITS.

3.4. Analysis

The Kappa statistic was used to assess the level of inter-rater agreement between the authors who assessed the eligibility of full text articles.

To determine changes in proportions of study types over the three time periods we used generalised linear models with a binomial distribution and an identity link. Time was coded as 1, 2 or 3, representing 10 year increments, and assumed to have a linear effect (on the log scale). Coefficients from this model are interpreted as the absolute difference in proportions for each ten year increment in time.