



# Educational pamphlets for improving uptake of cancer screening: a systematic review

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## ABSTRACT

**INTRODUCTION:** The effectiveness of cancer screening programmes is highly dependent on screening uptake. Many interventions have been tested to increase screening uptake.

**AIM:** The goal of this study was to evaluate the effectiveness of cancer screening pamphlets as a standalone intervention. The outcome of interest was uptake of cancer screening tests.

**METHODS:** A systematic review was performed on the effectiveness of pamphlets compared to usual care without pamphlets. We searched five databases for research papers in English from 2000 up to May 2019. Randomised controlled trials were included. This research group independently selected studies, extracted data, assessed risk of bias and then compared the information as a group.

**RESULTS:** A total of nine trials involving 4912 participants met our inclusion criteria, of which five were about colorectal cancer screening, three were about prostate cancer screening and one was about lung cancer screening. Five of the nine trials showed that pamphlets alone increased uptake significantly, while the remaining four trials did not show significant effects.

**DISCUSSION:** There is some evidence that pamphlets increase uptake for cancer screenings, especially for colorectal cancer. Due to the small number of studies in this area, generalisability could be limited.

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## Introduction

Cancer screenings are tests conducted on asymptomatic individuals to determine whether cancer might be present. They are targeted screenings, usually given to individuals of the age or sex at risk for the cancer.<sup>1</sup> The aim of screening is early detection and treatment to reduce cancer mortality and other serious consequences.<sup>2</sup>

Certain forms of cancer screening have been shown to reduce cancer mortality considerably. Since the 1960s, most developed countries have implemented population-based screening programmes, and reductions in mortality of 25–31% for breast cancer, 16% for colorectal cancer and 50–80% for cervical cancer have been attributed to screening.<sup>3</sup> These three cancers are among the seven most common

cancers worldwide, together accounting for 25.3% of all cancer cases.<sup>4</sup>

A screening programme's effectiveness is highly dependent on its uptake.<sup>5</sup> There is no universal approach to improving uptake, but many interventions have been tested.<sup>6</sup> Some are provider-oriented, such as physician reminders,<sup>7</sup> while others are patient-oriented, such as telephone counseling,<sup>8</sup> one-on-one education, group education, patient reminder letters, financial incentives and small media<sup>9</sup> (flyers, posters and brochures).

Pamphlets have been used to promote uptake of cancer screening for more than two decades.<sup>10</sup> The objective of this review was to evaluate the effectiveness of pamphlets as a standalone intervention for increasing cancer screening uptake among asymptomatic patients, when compared to usual care without pamphlets in randomised controlled trials.

## Methods

### Eligibility criteria

Our search was for studies published in English in or after the year 2000. We included randomised controlled trials (RCTs) in which an intervention using pamphlets only was compared to usual care without pamphlets. Outcomes measured had to include cancer screening uptake.

We excluded studies in which the intervention did not consist of pamphlets alone as we wanted to see the effect of pamphlets as a standalone intervention. We also excluded studies where the control group did not receive pamphlets, or in which the 'usual care' that the control group received was not defined. This was to exclude the possibility of the control group receiving some other form of pamphlet that was unreported.

### Databases and search strategy

#### *Electronic searches*

We devised a core search strategy in Ovid MEDLINE and adapted it for other databases using the appropriate syntax (see Supplementary Material file S1). We limited our searches to RCTs only using

pre-defined RCT filters, with the publication date from January 2000 to the current day.

On 10 May 2019, we searched the following five electronic databases: Ovid MEDLINE® and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions® 1946 to 10 May 2019; Embase 1974 to 10 May 2019 (Ovid); The Cochrane Library (Wiley); PsycInfo (EBSCOHost); CINAHL (EBSCOHost).

#### *Searching other resources*

A search for grey literature was carried out in May 2019 with the following resources, focusing on clinical trial registries: ClinicalTrials.gov (<https://clinicaltrials.gov/>); UK Clinical Trials Gateway (<https://bepartofresearch.nihr.ac.uk/>); UK Clinical Trials Gateway (<https://bepartofresearch.nihr.ac.uk/>); EU Clinical Trials Register (<https://www.clinicaltrialsregister.eu/>); International Clinical Trials Registry Platform (ICTRP) (<https://www.who.int/ictip/en/>); and Australian Clinical Trials (<https://www.australianclinicaltrials.gov.au/>).

Keywords such as 'booklet', 'booklets', 'brochure', 'brochures', 'pamphlet', 'pamphlets', 'leaflet', 'leaflets', 'handout', 'handouts', 'information sheet' and 'information sheets' were combined using the 'OR' boolean operator and used for searching the registries. Where possible, they are combined using the 'AND' boolean operator with the keywords 'cancer' and 'carcinoma', to retrieve relevant search results.

For more details on the grey literature search, please refer to Supplementary Material table S2.

### Study selection and data collection process

The search results for the electronic searches were combined in Covidence ([www.covidence.org](http://www.covidence.org)), the standard production platform for Cochrane reviews, headquartered in Australia. Each title and abstract were independently screened by at least two reviewers. If there were disagreements after the two reviewers had screened, a third reviewer would have the deciding vote.

In the next phase, full-text versions of the short-listed papers were retrieved and each was

independently assessed against eligibility criteria by two out of the three reviewers. Disagreements were resolved by consensus among all three reviewers.

Grey literature titles were screened by all three reviewers. All were excluded.

All relevant data were extracted using a structured form. Duplicates of the form were made, and for each study, at least two reviewers independently extracted the data using the form. The reviewers then compared the data extracted and differences were resolved through discussion with the third reviewer.

### Data items

Information was extracted from each study on:

- (1) Country where the study was conducted
- (2) Site(s) of study
- (3) Sample size
- (4) Type of participants
- (5) Type of screening
- (6) Different study arms
- (7) Details of study intervention (or not) received by each arm
- (8) Uptake-related outcome that was measured
- (9) Magnitude of outcome for each arm (% uptake)
- (10) Effect size for pamphlet versus no pamphlet

### Risk of bias in individual studies

To assess risk of bias in this review, we adapted the Scottish Intercollegiate Guidelines Network 50 (SIGN 50) checklist for controlled trials.<sup>11</sup> The papers were scored on validity and sample size. Some modifications were made to the SIGN 50 criteria as pamphlets were educational and not therapeutic interventions.

A structured form was created using the modified SIGN 50 criteria. Duplicates of the form were made and for each study two reviewers independently assessed risk of bias using the form. The authors then compared their scores and differences were resolved through discussion with the third reviewer.

### Summary measures

We report the effect size for pamphlets as difference in screening rate, which we calculated as the

percentage outcomes in the pamphlets arm minus the percentage outcomes in the control arm. If  $P < 0.05$  for the outcomes, we characterised a 0–10% difference as small, >10–20% as moderate and >20% as large.

## Results

### Included studies

Our searches yielded a total of 2621 citations, of which nine were included in the review. The PRISMA flowchart in Figure 1 shows the selection of articles. The characteristics of the included studies are summarised in Table 1.

Although many RCTs were found about interventions to increase screening uptake, only nine examined whether pamphlets actually increase uptake compared to usual care without pamphlets. Many of the excluded RCTs either studied the effectiveness of pamphlets relative to other interventions, or combined pamphlets with another intervention, or measured an outcome other than uptake, such as patient knowledge or inclination to take up the test.

### Types of studies

All included studies were published in peer-reviewed journals and had an RCT design.

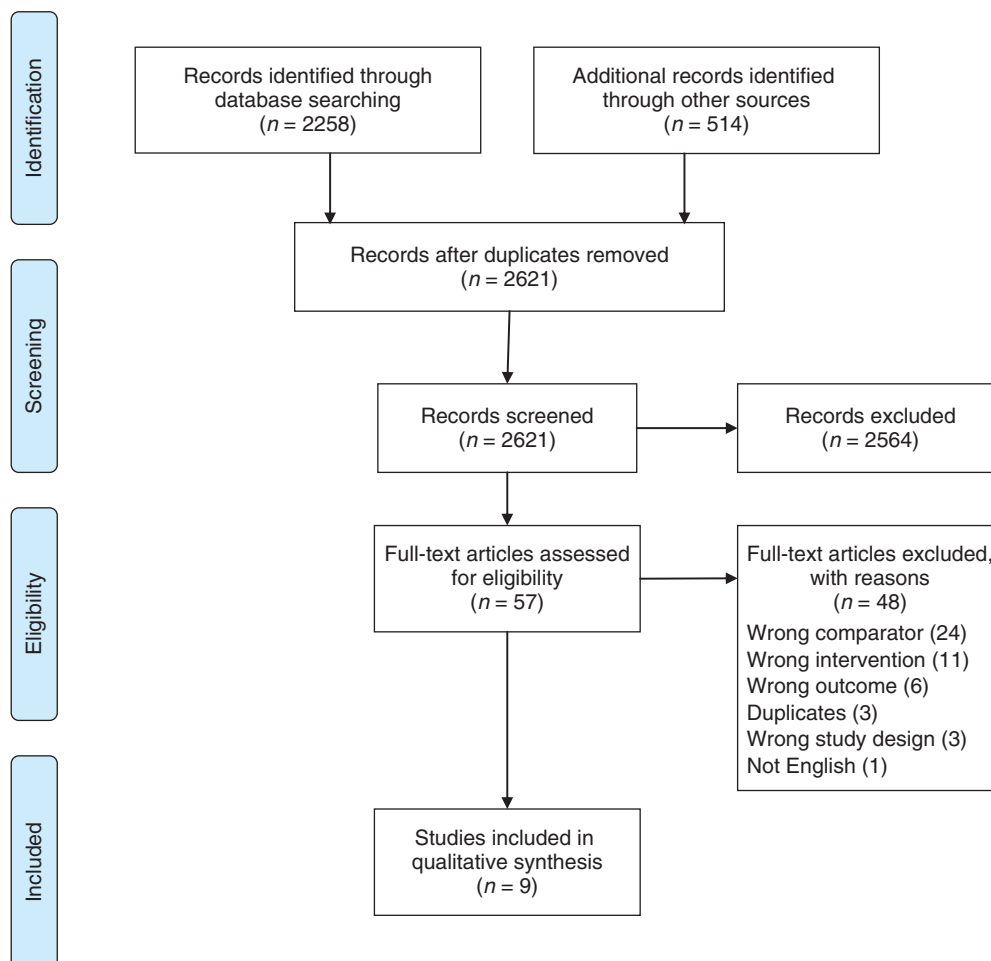
Five of the included studies were conducted in the USA, two were conducted in Australia, one in Greece and one in Japan. Five of the studies were for colorectal cancer screening, three were for prostate cancer screening and one was for lung cancer screening. No cervical cancer or breast cancer screening studies met our search criteria.

Three of the studies were conducted in primary care settings, two were conducted in internal medicine clinics and one was conducted across both a family medicine clinic and an internal medicine clinic. Two were conducted only in hospitals or institutions, and one was city-wide.

### Effects of interventions

Five studies reported that pamphlets significantly increased screening uptake ( $P < 0.05$ ). Of these,

Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)<sup>12</sup> flowchart showing selection of articles.



two studies (Stamatiou et al. 2008<sup>19</sup>; Le 2014<sup>17</sup>) showed a large increase in uptake ( $>20\%$ ) and three studies (Denberg et al. 2006<sup>13</sup>; Harris et al. 2000<sup>14</sup>; Lee et al. 2009<sup>18</sup>) showed a moderate increase (10–20%). The remaining four studies reported that the pamphlets did not have a significant effect on uptake.

In the studies by Le (2014)<sup>17</sup> and Harris et al. (2000)<sup>14</sup>, pamphlets were distributed before physician encounters, while in the studies by Denberg et al. (2006)<sup>13</sup> and Lee et al. (2009)<sup>18</sup>, pamphlets were distributed a period of time after physician encounters. Stamatiou et al. (2008)<sup>19</sup> did not specify when the pamphlet was distributed. The effectiveness of the pamphlets was not limited to distribution at a single timepoint.

### Colorectal cancer screening

Five studies were about colorectal cancer screening. Of these, four (Denberg et al. 2006<sup>13</sup>; Harris et al. 2000<sup>14</sup>; Le 2014<sup>17</sup>; Lee et al. 2009<sup>18</sup>) showed a moderate (10–20%) or large ( $>20\%$ ) increase in uptake with the pamphlets and their risk-of-bias scores ranged from four to eight out of eight. The remaining study, which did not show a significant difference, was Stephens and Moore (2008).<sup>20</sup> Compared to the other studies, it had a smaller sample size of 91 and a lower risk-of-bias score of three out of eight.

All four studies showing a significant effect involved patients' encounters with their primary care

Table 1. Characteristics of the included randomised controlled trials

Title, author, year, country	Site	Size (no. of subjects)	Subjects	Cancer (Screening type)	Groups	Outcome	Effect size with leaflet vs. usual care	Study quality score
1. Effect of a mailed brochure on appointment-keeping for screening colonoscopy, Denberg et al. 2006, <sup>13</sup> USA	Two university-linked general IM clinics	781	Patients aged $\geq 50$ years who had been referred for screening colonoscopy	CRC (Colonoscopy)	1. Usual care: After consultation, primary care doctors refer patients for screening colonoscopy. Patients receive written instructions to schedule a procedure. 2. Usual care + Brochure: Within 10 days of referral, an investigator-developed brochure is mailed to the patient. In addition to educational content, the brochure is personalised with his primary care physician's name and contains a reminder to schedule the procedure.	Rate of adherence to colonoscopy referral within 4 months, assessed by whether an electronic claim was generated: 1. Usual care = 59.0%. <b>2. Brochure = 70.7%.</b> $P = 0.001$ .	11.7% Moderate increase	7
2. A general practice-based recruitment strategy for colorectal cancer screening, Harris et al. 2000, <sup>14</sup> Australia	26 GP clinics	303	Patients aged $\geq 50$ years who were first-degree relatives of a person with CRC	CRC (Colonoscopy with or without FOBT or other combinations)	1. No pamphlet given: Patients who attended their GP filled out an eligibility questionnaire. They did not receive a pamphlet. 2. Pamphlet: Same as the above, except that a screening pamphlet was attached to the eligibility questionnaire. The pamphlet had a tear-off page to request for screening.	Screening requests made by the patient within 6 weeks, as reported by GP: 1. No pamphlet = 4%. <b>2. Pamphlet = 18%.</b> $P = 0.01$ .	14% Moderate increase	4
3. Patient education on prostate cancer screening and involvement in decision-making, Krist et al. 2007, <sup>15</sup> USA	Family practice centre	497	Men aged 50–70 years scheduled for health maintenance exams	Prostate (PSA testing)	1. Control: No pre-visit educational material and no decision aids during discussion. 2. Brochure: Mailed paper version of web-based decision aid. 3. Website: Web-based decision aid developed by authors, covering cancer information, screening, risks and benefits of screening and current uncertainties.	PSA test ordered, as reported by physicians in a survey after each patient encounter: 1. Control = 94%. <b>2. Brochure = 85%.</b> 3. Website = 86%. $P = 0.06$ .	No significant effect	6

(Continued)

Table 1. (Continued)

Title, author, year, country	Site	Size (no. of subjects)	Subjects	Cancer (Screening type)	Groups	Outcome	Effect size with leaflet vs. usual care	Study quality score
4. Shared decision-making in prostate-specific antigen testing: the effect of a mailed patient flyer before an annual exam, Landrey et al. 2013, <sup>16</sup> USA	Two general IM practices affiliated with a hospital	303	Men aged 50–74 years scheduled for annual health maintenance exams	Prostate (PSA testing)	1. Usual care: No flyer. 2. Mailed flyer: One week before appointments, patients were mailed an author-developed flyer.	PSA test ordered, as documented in her: 1. Usual care = 58.5%. 2. Mailed flyer = 62.5%. $P = 0.48$ .	No significant effect	5
5. Patient prompting of their physician resulted in increased colon cancer screening referrals, Le 2014, <sup>17</sup> USA	An internal medicine resident clinic (IMRC) and a family medicine resident clinic (FMRC)	148 (IMRC) + 126 (FMRC)	Patients in waiting area eligible for colorectal cancer screening and not screened before	CRC (Colonoscopy)	1. Control: No pamphlet. 2. Intervention: Before seeing the primary care physician, patient receives a pamphlet and a CRC screening reminder card to be given to the primary care physician for colorectal cancer screening referral.	Frequency of referral for screening. IMRC: 1. Control = 63%. <b>2. Intervention = 92%.</b> $P \leq 0.001$ . FMRC: 1. Control = 71%. <b>2. Intervention = 98%.</b> $P \leq 0.001$ .	29% in IMRC and 27% in FMRC. Large increase	6
6. Improving faecal occult blood testing compliance using a mailed educational reminder, Lee et al. 2009, <sup>18</sup> USA	Veterans' Affairs primary care clinics	775	Patients aged $\geq 50$ years referred by primary care physician for FOBT	CRC (FOBT)	1. Usual care: Primary care physician orders FOBT. Patients are instructed to pick up a card from the laboratory and mail back the completed kits. 2. Usual care + mailed educational reminder: In addition to usual care, an educational reminder personalised with the patient's name is mailed to the patient 10 days after the patients were given FOBT cards.	Returned FOBT card kit 1. Usual care = 48.4%. <b>2. Usual care + mailed educational reminder = 64.6%</b> $P < 0.001$	16.2% Moderate increase	8

(Continued)

Table 1. (Continued)

Title, author, year, country	Site	Size (no. of subjects)	Subjects	Cancer (Screening type)	Groups	Outcome	Effect size with leaflet vs. usual care	Study quality score
7. Does educational printed material make people more likely to change compliance with prostate cancer screening?, Stamatiou et al., 2008, <sup>19</sup> Greece	Institutions	1500	Men aged 50–86 years who attended primary care appointments for non-prostate-related conditions	Prostate (PSA testing alone, DRE alone or PSA and DRE)	1. Non-informed: Physician has a discussion with patient in examination room during interview. 2. Informed: Patient receives additional written information.	Self-reported DRE within 24 months: 1. Non-informed = 5%. <b>2. Informed = 4%.</b> $P > 0.05$ . Self-reported PSA test within 24 months: 1. Non-informed = 38.6% <b>2. Informed = 80%</b> $P < 0.05$ .	DRE: No significant effect. PSA: 41.4%. Large increase	3
8. Can targeted intervention in CRC patients' relatives influence screening behaviour? A pilot study. Stephens and Moore 2008, <sup>20</sup> Australia	Two hospitals in South Australia	91	First-degree relatives of patients diagnosed with CRC and undergoing elective resection	CRC (FOBT/Colonoscopy)	1. Standard care: The information provided to the index patient by their treating surgeon regarding risk associated with family history of colorectal cancer, as per current clinical practice. 2. Intervention: Leaflet is mailed to the subject after 1 week.	Self-reported screening uptake within 3 months: 1. Standard care = 8%. <b>2. Intervention = 6%.</b> $P = 0.91$ .	No significant effect	3
9. Interventional study for improvement of lung cancer screening rate, Yoshida et al., 2012, <sup>21</sup> Japan	Anan City	388	Men and women aged 40–59 years	Lung (screening type not stated)	1. Control: Leaflet not distributed to them. 2. Intervention: Leaflet was mailed to them.	Self-reported screening undergone that year: 1. Control = 18%. <b>2. Intervention = 29%.</b>	11% but of unknown significance	2

CRC (colorectal cancer); DRE (digital rectal examination); EHR (electronic health records); FOBT (faecal occult blood test); GP (general practitioner); IM (internal medicine); PSA (prostate-specific antigen).



physician. In Denberg et al. (2006),<sup>13</sup> the leaflets were personalised with the patient's primary care physician's name. Denberg et al.<sup>13</sup> reported a relative risk of 1.20 for brochure uptake versus usual care uptake (95% CI = 1.09–1.33). The study by Harris et al. (2000)<sup>14</sup> involved 26 general practices and the pamphlet was given to relatives on enrolment, when they attended the practice. Harris et al. (2000)<sup>14</sup> showed a significant increase in screening tests. It found that the odds ratio between intervention and control groups was 4.7 in favour of the pamphlet ( $P = 0.01$ , 95% CI = 1.4–18.7).

Like Harris et al. (2000),<sup>14</sup> the study by Stephens and Moore (2008)<sup>20</sup> was conducted in Australia and targeted first-degree relatives of colorectal cancer patients. The study by Stephens and Moore (2008)<sup>20</sup> was conducted in a hospital surgical setting and did not involve encounters with primary care physicians.

### Prostate cancer screening

Three studies addressed prostate cancer screening. Of these, two showed no significant difference with the pamphlets. In both studies, the pamphlets were decision aids that covered, among other things, the risks of screening (Landrey et al. 2013<sup>16</sup>) and current uncertainties (Krist et al. 2007).<sup>15</sup>

The remaining study (Stamatiou et al. 2008)<sup>19</sup> found a large increase in prostate-specific antigen (PSA) test uptake in the informed group (38.6% control vs. 80% intervention). However, we observed large differences in baseline characteristics of the two study groups. Stamatiou et al. (2008)<sup>19</sup> found that PSA testing was well accepted in the informed group, while digital rectal examination (DRE) was not. This was despite the pamphlet encouraging the patient to agree to a DRE together with PSA tests. Reasons are unclear; the authors' view is that this result is probably due to a prejudice of the male population or that when given information about its low sensitivity and specificity, patients considered DRE 'worthless'.

### Lung cancer screening

One study focused on lung cancer screening. It showed an increase in the pamphlets arm (18% control vs. 29% intervention), but this effect was of unknown significance.

### Risk of bias across studies

Our risk-of-bias assessment of the studies is shown in Table 2. One study (Lee et al. 2009)<sup>18</sup> scored the full eight marks on our risk-of-bias assessment (48.4% control vs. 64.6% intervention). This study reported a 15.2% increase in uptake. Four studies scored five to seven marks and the remaining four studies scored four or less.

### Discussion

The aim of this review was to evaluate the effectiveness of cancer screening pamphlets as a stand-alone intervention to increase screening uptake, in comparison with usual care. There is some evidence that pamphlets increase uptake for colorectal cancer screening when used in primary care. As for prostate cancer and lung cancer screening, we found very few studies, so generalisability is limited. We were unable to find data on pamphlets as a stand-alone intervention for breast and cervical cancer screening.

### Limitations

When people participate in research and are aware of being studied, there is a possible effect on their behaviour, often termed the Hawthorne effect.<sup>22</sup> Three of the nine identified studies (Denberg et al. 2006<sup>13</sup>, Landrey et al. 2013<sup>16</sup> and Le 2014<sup>17</sup>) used strategies to avoid the Hawthorne effect – the former two by obtaining waiver of consent, the latter one through randomisation by day of clinic rather than by patient. The other six studies did not use such strategies and therefore may be influenced by the Hawthorne effect.

The small number of studies retrieved limits the generalisability of our conclusions. The narrow scope of the review does not allow us to explore the effectiveness of pamphlets combined with or compared to other interventions. We are also unable to make an assessment of publication bias and there may have been relevant studies that were not written in English.

### Conclusion

There is some evidence that pamphlets increase uptake for cancer screenings, especially for



Table 2. Risk of bias assessment of the included randomised controlled trials

Criteria	1. Denberg et al. 2006 <sup>13</sup>	2. Harris et al. 2000 <sup>14</sup>	3. Krist et al. 2007 <sup>15</sup>	4. Landrey et al. 2013 <sup>16</sup>	5. Le 2014 <sup>17</sup>	6. Lee et al. 2009 <sup>18</sup>	7. Stamatou et al. 2008 <sup>19</sup>	8. Stephens and Moore 2008 <sup>20</sup>	9. Yoshida et al. 2012 <sup>21</sup>
The study addresses an appropriate and clearly focused question Yes = +1, Unknown = 0, No = -1	+1	+1	+1	+1	+1	+1	+1	+1	+1
The assignment of subjects to treatment groups is randomised Yes = +1, Unknown = 0, No = -1	+1	+1 (cluster-randomised)	+1	+1	+1	+1	+1	+1	+1
Uptake is measured in a standard, valid and reliable way Yes = +1, Unknown = 0, No = -1	+1	0 (patient-reported)	0 (physician-reported)	+1 (EHR)	0 (patient-reported)	+1 (returned kits)	0 (patient-reported)	0 (patient-reported)	0 (patient-reported)
Treatment and control groups' baseline characteristics are similar Yes = +1, Unknown = 0, No = -1	+1	0	+1	+1	+1	+1	-1	+1	+1
Adequate follow-up rate Yes = +1, Unknown = 0, No = -1	0	0	+1	+1	+1	+1	+1	-1	-1
Intention-to-treat analysis done Yes = +1, Unknown = 0, No = -1	+1	+1	+1	-1	+1	+1	-1	+1	-1
What was the sample size? <100 = 0, 100–500 = 1, >500 = 2	+2 (781)	+1 (303)	+1 (497)	+1 (303)	+1 (274)	+2 (775)	+2 (1500)	0 (91)	+1 (388)
TOTAL (maximum score is 8)	7	4	6	5	6	8	3	3	2

EHR (electronic health records).

colorectal cancer. These studies involved primary care physicians. Future research could explore whether primary care physician involvement makes a difference to the effect, and the reasons for this.

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### Competing interests

The authors do not have any competing interests.

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### References

1. Brawley OW, Kramer BS. Cancer screening in theory and in practice. *J Clin Oncol*. 2005;23(2):293–300. doi:10.1200/JCO.2005.06.107
2. Bonita R, Beaglehole R, Kjellström T. Basic epidemiology, 2nd edn. Chapter 6: Epidemiology and prevention: chronic non-communicable diseases. Geneva: World Health Organization; 2006. pp. 110–114.
3. Stewart BW, Wild CP. 4.8. Screening – implementation. *World Cancer Report 2014*. Lyon: International Agency for Research on Cancer; 2014. pp. 330–335.
4. Forman D, Forlay J. 1.1. The global and regional burden of cancer. *World Cancer Report 2014*. BW Stewart, CP Wild, eds. Lyon: International Agency for Research on Cancer; 2014.
5. Weller DP, Campbell C. Uptake in cancer screening programmes: a priority in cancer control. *Br J Cancer*. 2009;101:S55–9. doi:10.1038/sj.bjc.6605391
6. Weller DP, Patrick J, McIntosh HM, Dietrich AJ. Uptake in cancer screening programmes. *Lancet Oncol*. 2009;10(7):693–9. doi:10.1016/S1470-2045(09)70145-7
7. Sequist TD, Zaslavsky AM, Marshall R, et al. Patient and physician reminders to promote colorectal cancer screening: a randomized controlled trial. *Arch Intern Med*. 2009;169(4):364–71. doi:10.1001/archinternmed.2008.564
8. Champion V, Skinner CS, Hui S, et al. The effect of telephone v. print tailoring for mammography adherence. *Patient Educ Couns*. 2012;100(2):130–4.
9. Maxwell AE, Hannon PA, Escoffery C, et al. Promotion and provision of colorectal cancer screening: a comparison of Colorectal Cancer Control Program grantees and nongrantees 2011–2012. *Prev Chronic Dis*. 2014;11:140183. doi:10.5888/pcd11.140183
10. Mahon SM. Using brochures to educate the public about the early detection of prostate and colorectal cancer. *Oncol Nurs Forum*. 1995;22(9):1413–20.
11. Scottish Intercollegiate Guidelines Network. Methodology Checklist 2: Controlled Trials. [cited 2018 May 26]. Available from: <https://www.sign.ac.uk/sign-50.html>
12. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *J Clin Epidemiol*. 2009;62(10):1006–12. [cited 2017 April 17]. Available from: <http://www.equator-network.org/reporting-guidelines/prisma/>.
13. Denberg TD, Coombes JM, Byers TE, et al. Effect of a mailed brochure on appointment-keeping for screening colonoscopy. *Ann Intern Med*. 2006;145(12):895–900. doi:10.7326/0003-4819-145-12-200612190-00006
14. Harris MA, Byles JE, Cockburn J, D'Este C. A general practice-based recruitment strategy for colorectal cancer screening. *Aust N Z J Public Health*. 2000;24(4):441–3. doi:10.1111/j.1467-842X.2000.tb01609.x
15. Krist AH, Woolf SH, Johnson RE, William Kerns J. Patient education on prostate cancer screening and involvement in decision making. *Ann Fam Med*. 2007;5(2):112–9. doi:10.1370/afm.623
16. Landrey AR, Matlock DD, Andrews L, et al. Shared decision making in prostate-specific antigen testing. *J Prim Care Community Health*. 2013;4(1):67–74. doi:10.1177/2150131912447074
17. Le V. Patient prompting of their physician resulted in increased colon cancer screening referrals. *World J Gastrointest Oncol*. 2014;6(7):257–62. doi:10.4251/wjgo.v6.i7.257
18. Lee JK, Reis V, Liu S, et al. Improving fecal occult blood testing compliance using a mailed educational reminder. *J Gen Intern Med*. 2009;24(11):1192–7. doi:10.1007/s11606-009-1087-5
19. Stamatiou K, Skolarikos A, Heretis I, et al. Does educational printed material manage to change compliance with prostate cancer screening? *World J Urol*. 2008;26(4):365–73. doi:10.1007/s00345-008-0258-z
20. Stephens JH, Moore JW. Can targeted intervention in CRC patients' relatives influence screening behaviour? A pilot study. *Colorectal Dis*. 2008;10(2):179–86.
21. Yoshida M, Kondo K, Nakanishi C, Tada T. Interventional study for improvement of lung cancer screening rate. *J Med Invest*. 2012;59(1,2):127–35. doi:10.2152/jmi.59.127
22. McCambridge J, Witton J, Elbourne DR. Systematic review of the Hawthorne effect: new concepts are needed to study research participation effects. *J Clin Epidemiol*. 2014;67(3):267–77. doi:10.1016/j.jclinepi.2013.08.015