

Effectiveness of Mass and Small Media Campaigns to Improve Cancer Awareness and Screening Rates in Asia: A Systematic Review

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PURPOSE The main objective of this systematic review was to identify whether mass and small media interventions improve knowledge and attitudes about cancer, cancer screening rates, and early detection of cancer in Asia.

METHODS The review was conducted according to a predefined protocol. Medline, EMBASE, CINAHL, Web of Science, Cochrane Library, and Google Scholar were searched in September 2017, and data extraction and rating of methodologic study quality (according to Joanna Briggs Institute rating procedures) were performed independently by reviewers.

RESULTS Twenty-two studies (reported across 24 papers) met the inclusion criteria. Most studies (n = 21) were conducted in high or upper-middle income countries; targeted breast (n = 11), cervical (n = 7), colorectal (n = 3), or oral (n = 2) cancer; and used small media either alone (n = 15) or in combination with mass media and other components (n = 5). Studies regarding cancer screening uptake were of medium to high quality and mainly reported positive outcomes for cervical cancer and mixed results for breast and colorectal cancer. The methodologic strength of research that investigated change in cancer-related knowledge and the cost effectiveness of interventions, respectively, were weak and inconclusive.

CONCLUSION Evidence indicated that small media campaigns seemed to be effective in terms of increasing screening uptake in Asia, in particular cervical cancer screening. Because of the limited number of studies in Asia, it was not possible to be certain about the effectiveness of mass media in improving screening uptake and the effectiveness of campaigns in improving cancer-related knowledge.

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INTRODUCTION

According to the Global Cancer Observatory (GLOBOCAN; April 10, 2018), Asia accounts for almost one half of newly detected cancer cases (48.4%) and more than one half of cancer deaths globally (57.3%). The most common cancers are lung, colorectal, breast, stomach, and liver cancer.¹ Asia is a continent composed of diverse countries in terms of cultures and religions as well as economies. Most Asian countries have developing economies and are classified as low- or middle-income countries (LMICs).² The strong association between the Human Development Index and age-standardized cancer incidence is reflected in the high cancer incidence rates in Asia given that most Asian countries are LMICs.³ LMICs experience high cancer mortality rates, and many deaths could be avoided through improved screening services that would facilitate early presentation and treatment.⁴ Population-based screening programs are lacking in most Asian countries, and the often less than optimum

availability of screening facilities contributes to late detection.⁴ One of the priorities of the WHO is to reduce premature mortality from noncommunicable diseases including cancer by 25% by 2020.⁵ According to the WHO and other experts, one of the first steps towards early diagnosis is to raise awareness about cancer signs and symptoms and to encourage the seeking of help.⁵ Therefore, there is a priority need for programs that raise awareness about the warning signs and symptoms of cancer and the benefits of early detection. This form of secondary prevention should be implemented in countries in which resources for population-based screening are lacking, particularly for cancers such as colorectal and breast cancer.⁶

Evaluations of mass and small media programs in Western countries have reported promising results in terms of promoting healthy behaviors,⁷ increasing cancer-related knowledge,⁸ improving screening rates,^{9,10} and diagnosing cancer at an earlier stage.¹¹ However, there is a need to identify, appraise, and

ASSOCIATED CONTENT

Appendix

Author affiliations and support information (if applicable) appear at the end of this article.

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CONTEXT

Key Objective

This research systematically reviewed studies that used mass or small media to prevent cancer in Asia.

Key Findings

High- and middle-income Asian countries tend to focus on prevention and early detection regarding mainly breast cancer and cervical cancer. Cervical cancer small media campaigns seem to be effective in increasing screening uptake.

Relevance

Research in low-income Asian countries is sparse due to inadequate resources. There is a need to increase empirical studies in Asia and to advance the use of research to inform and target the efficiency of prevention efforts such as public health media campaigns and plans towards reducing the significant cancer burden throughout Asia.

summarize available evidence about the effectiveness of media campaigns to improve health-seeking behavior for cancer-related symptoms in Asia.¹² Mass media include communication channels such as television, radio, newspapers, billboards, posters, the Internet, and smart media (ie, smartphones, smart TVs, and tablets) intended to reach large numbers of people.^{7,13,14} Small media are generally aimed at individuals rather than groups (eg, mailed letters and/or other mailed information [eg, brochures and leaflets], telephone calls, e-mails, text messages [Short Message System], and CDs or videos intended for individuals or small group viewings).¹⁵ The aim of this systematic review was to identify whether mass and/or small media campaigns increased knowledge and awareness about signs and symptoms of cancer, improved attitudes towards cancer screening, and increased screening attendance, self-screening, and detection rates of cancer in Asian countries.

METHODS

This systematic review was conducted according to PRISMA guidelines and the protocol was preregistered with PROSPERO.¹⁶

Search Strategy

A search strategy was developed in consultation with an information specialist with experience in devising electronic search strategies for systematic reviews. In September 2017, D.S. conducted the search, according to the pre-defined search terms (Appendix Table A1) and protocol, in the following databases: MEDLINE, Embase, CINAHL, Web of Science, PsycINFO, Scopus, Cochrane Library, Grey literature (ie, government reports and conference abstracts), and Google Scholar. In addition, reference lists of relevant reviews and studies were hand searched, and an individual search was conducted of relevant journals. The abstract and full-text screening of every paper was conducted by two pairs of reviewers (D.S. and M. Donnelly, T.T.S. or D.P.), and any discrepancies were resolved by a third reviewer (M. Donnelly).

Study Selection

Publications that reported findings from campaigns using mass media (TV, radio, Internet, mobile telephone, social media, newsletters, or magazine or print advertisement), small media (brochures, leaflets, newsletters, letters, or videos), or both, were included in this systematic review if they included one of the primary outcomes under investigation: (1) cancer awareness, (2) cancer knowledge, (3) attitudes and beliefs about cancer, (4) self-efficacy to self-screen and/or see a doctor, (5) actual self-screening behavior, (6) clinical attendance because of cancer-related symptoms, (7) cancer screening attendance, and (8) numbers of cancer cases detected. Secondary outcome measures under review were the cost effectiveness of campaigns and downstaging of cancer.

Inclusion criteria. Randomized and nonrandomized studies, cohort studies, quasi-experimental studies (QESs), interrupted time series, and pilot studies were eligible for inclusion if they met the following criteria: (1) were in a peer-reviewed publication, (2) were written in the English language, (3) were published before September 2017, (4) included adults 18 years of age or older, (5) were set in Asia, (6) targeted the general population or a subpopulation, (7) included mass and/or small media components that addressed at least one outcome, (8) kept individual and/or group intervention components to a minimum, and (9) investigated any cancer.

Exclusion criteria. We excluded (1) interventions that were targeted at minority Asian populations (eg, Chinese living in the United States); (2) systematic reviews and cross-sectional studies, as well as conference abstracts and brief communications if sufficient details could not be obtained; and (3) studies of patients with diagnosed cancer and/or health professionals alone (studies targeting both health professionals and general populations were considered).

Data Extraction

Heterogeneity among the studies under review did not allow for a meta-analysis to be conducted as originally planned. Instead, we systematically extracted data independently from included full-text papers into a data capture template. As with the search strategy, two pairs of reviewers (D.S. and

D.P., M. Dahlui, S.Y.L. or M. Donnelly) extracted data and discrepancies between reviewers were resolved by discussion with M. Donnelly.

Methodological Quality Assessment

We applied the relevant critical appraisal tool by the Joanna Briggs Institute (JBI) to assess the quality of each included study. Randomized controlled trials (RCTs) were scored on 13 questions and QESs were scored on nine items. D.S. and C.T. conducted the quality review, and any disagreement was resolved in discussion with M. Donnelly.

RESULTS

The search generated 18,374 studies, of which 22 studies (published in 24 papers) met the eligibility criteria for inclusion in this systematic review (Fig 1). According to the JBI study criteria, 11 of 22 studies were RCTs (published in 13 papers) and 11 of 22 studies were QESs.

Study Quality

RCTs were of medium to high quality (Table 1; ie, all studies met seven to 10^{17,18} JBI criteria). Criteria that were not met related mainly to blinding of participants, individuals delivering the intervention, and outcome assessors. In addition, some papers were unclear about whether random assignment had taken place or treatment allocation had been concealed. QESs

were of mixed quality and ranged from meeting two of nine criteria¹⁹ to nine of nine criteria^{20,21} (Table 2).

Study Characteristics

Study characteristics are outlined in Tables 1 and 3.

Study population. The majority of studies focused on breast cancer,^{17,20,28-30,33,34,36,37,39,41} followed by cervical cancer,^{20-23,31,32,35,41,42} colorectal cancer,²⁵⁻²⁷ oral cancer,^{38,40} and gastric cancer.²⁷ The countries in which the studies were conducted included Japan,^{20,21,26,28,41} Malaysia,^{22,23,40,42} Korea,^{27,37,39} Taiwan,^{17,31,32} Israel,^{25,36} Lebanon,^{19,29} Singapore,^{30,33} India,³⁴ Turkey,³⁵ and Iran³⁸ (Fig 2).

Individual studies targeted between 45 and 75,559 participants. Studies that aimed to increase awareness about breast and cervical cancer included women only, with the exception of two studies, one of which targeted the parents of adult daughters²⁰ and another study that targeted both mothers and daughters.³⁷ A study focusing on colorectal and gastric cancer targeted men only,²⁷ and four studies (either targeting colorectal or oral cancer) included both men and women.^{25,26,38,40} The age range of included participants differed among studies and the type of cancer addressed (ie, cervical cancer awareness studies generally targeted women 20 years of age and older, breast cancer awareness studies targeted those 30 years of age and older, and some included women 50 years of age and older (with

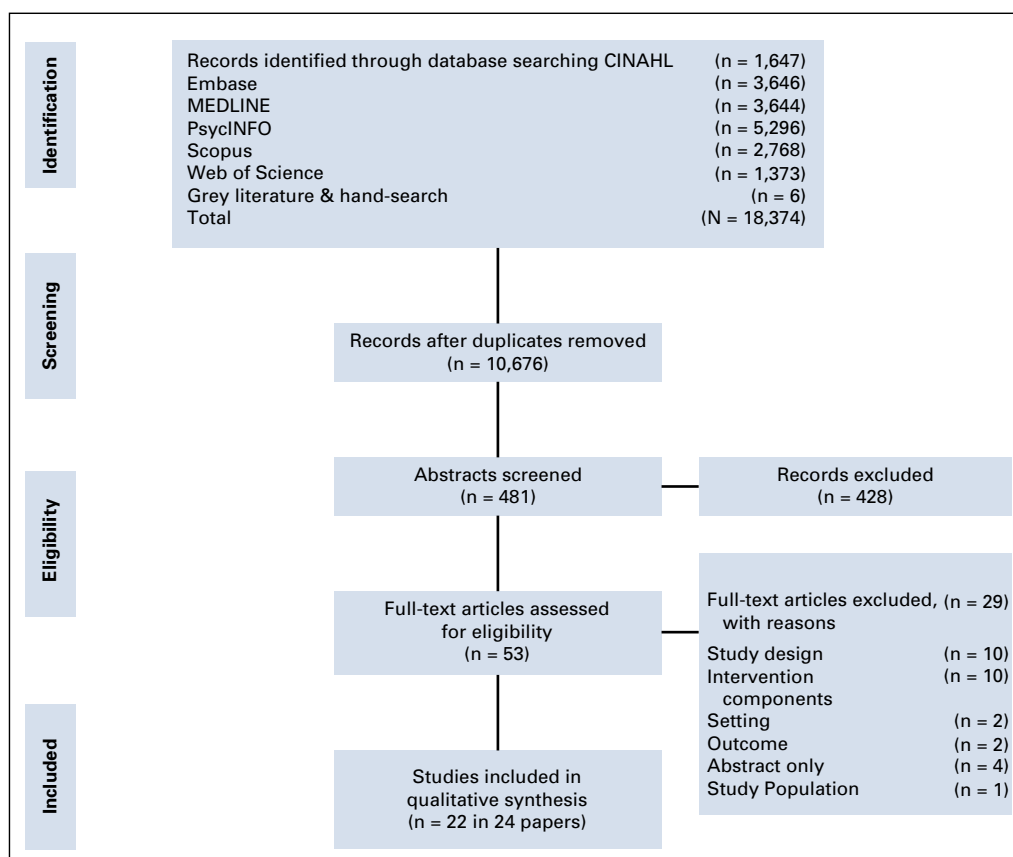


FIG 1. PRISMA flowchart of study selection.

TABLE 1. Study Quality of Randomized Controlled Trials According to JBI criteria

First Author	True RA	Concealed Allocation to TGs	Similarity Between TGs at Baseline		Blinding of Those Delivering Treatment		Blinding of OAs	Identical Treatment of Groups (oti)	Complete Follow-Up	Analysis of Participants in Groups to Which They Were Randomly Assigned		Same Measurements for TGs	Reliable Measures	Approp. Statistics	Approp. Trial Design	Overall Rating
			Concealed Allocation to TGs	Similarity Between TGs at Baseline	Blinding of Participants	Blinding of Those Delivering Treatment				Blinding of OAs	Identical Treatment of Groups (oti)					
Abdul Rashid ^{22,23}	+	?	+	?	?	?	+	+	+	+	+	+	+	+	+	10+
Abdullah ²⁴	+	+	+	-	-	-	?	+	+	-	+	+	-	+	+	7+
Hagoel ²⁵	?	?	+	+	?	?	+	+	+	-	+	+	+	+	+	9+
Hiral ²⁶	?	?	+	?	?	?	+	+	+	+	?	?	+	+	+	8+
Hong ²⁷	?	?	?	?	-	-	?	?	+	+	+	+	+	+	+	7+
Ishikawa ²⁸	+	?	-	?	+	+	-	-	+	+	+	+	+	+	+	9+
Lakkis ²⁹	+	?	?	?	+	+	?	+	+	+	+	+	+	+	+	9+
Lin ¹⁷	+	+	+	?	+	+	?	+	+	?	?	+	+	+	+	10+
Ng ³⁰	?	?	?	+	?	?	?	+	+	+	+	+	+	?	+	7+
Hou ^{31,32}	-	-	+	?	?	?	?	+	+	-	-	+	+	+	+	7+
Seow ³³	+	?	?	?	-	-	?	+	-	+	+	+	+	+	+	7+

Abbreviations: Approp., appropriate; +, yes; -, no; ?, unclear; JBI, Joanna Briggs Institute; n/a, not applicable; OAs, outcome assessors; oti, other than intervention; RA, random assignment; TGs, treatment groups.

TABLE 2. Study Quality of Quasi-Experimental Studies According to JBI Criteria

First Author	Clear Cause and Effect		Participants Were Included in Any Comparisons Similar	Similar Treatment of Groups Other Than the Intervention of Interest	Control Group Present	Multiple Measurements of Outcome	Complete Follow-Up and Adequate Description of Differences	Outcomes of Participants Included Comparisons Measured in the Same Way	Reliable Measurement of Outcomes	Appropriate Statistical Analysis	Total Score
	+	-									
Adlb ¹⁹	+	-	-	-	-	-	n/a	n/a	-	+	2+
Gadjij ³⁴	+	+	+	+	-	+	n/a	n/a	+	+	6+
Guvenc ³⁵	+	+	+	+	-	+	-	n/a	-	-	4+
Heymann ³⁶	+	?	+	+	+	+	+	n/a	+	?	6+
Heo ³⁷	+	+	+	+	-	-	-	n/a	+	-	4+
Motallebnejad ³⁸	+	+	+	+	-	-	n/a	n/a	+	-	4+
Park ³⁹	+	-	+	+	+	-	n/a	+	+	+	6+
Saleh ⁴⁰	+	-	+	+	-	-	n/a	n/a	+	+	4+
Tabuchi ⁴¹	+	+	+	+	+	-	n/a	+	+	+	7+
Ueda ²¹	+	+	+	+	+	+	+	+	+	+	9+
Yag ²⁰	+	+	+	+	+	+	+	+	+	+	9+

Abbreviations: +, yes; -, no; ?, unclear; JBI, Joanna Briggs Institute; n/a, not applicable.

TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies
Classification of Intervention (small media, mass media, or others) and Intervention

First Author and Country	Population	Classification of Intervention (small media, mass media, or others) and Intervention	Timeline	Outcome(s)
Randomized controlled trials				
Breast cancer				
Ishikawa ²³ Japan	Characteristics: women 51-59 years old (except 55 years old), listed in local health department database, no screening in past 2 years Sample: n = 8,100 eligible and contacted; n = 3,236 replied (recontacted) Setting: community	Small media IG: (1) individual assessment; (2) assessment-based tailored letter to prompt study participants to participate in mammography screening (divided into 3 segments: high intention; low intention and high breast cancer worry; low intention and low breast cancer worry); (3) participants then had to return postcard to receive tickets for free screening, which they could use at local clinics CG: nontailored reminder	Intervention delivered during November 2009 Follow-up: data were collected for 5 months	Primary: mammogram uptake Secondary: cost effectiveness Outcomes were collected from medical records from health clinics
Lakkis ²⁴ Lebanon	Characteristics: women 40-75 years old, with health insurance plan and cell phone number; no screening in the past 2 years Sample: n = 385 participated; IG1 = 192, IG2 = 193 Setting: family medicine center	Small media IG1: SMS screening invitation for a mammogram IG2: same as IG1 and additional SMS including information about mammograms; 3 identical messages sent to each group (with 4 weeks in between each SMS); cost of mammogram covered by insurance	Intervention delivered from April to June 2010 Follow-up: data were collected for 6 months	Primary: mammogram uptake Outcome was collected from medical records from Family Medicine Centre
Lin ²⁵ Taiwan	Characteristics: women 35-69 years old, no screening experience and no intention to have screening, never had breast cancer, Internet at home or work + computer experience Sample: n = 144 recruited; n = 128 completed (IG: 64; CG: 64) Setting: community	Small media All delivered through computer: IG: (1) mini-lecture video showing mammogram procedure; (2) video clips with personal testimonies of survivors and a woman who regularly went for mammography; (3) role modeling via audiovisual presentation of stories of breast cancer survivors (note: issues related to personality and Taiwanese customs were addressed in videos) CG: standard intervention (educational brochure, also published on Web site)	Intervention duration was between 15 and 40 min Follow-up: measurements taken directly before and after intervention	Primary: perceptions and intentions to obtain mammogram Outcomes were self-reported through 3 validated tools: Stage of Adoption of Mammogram; Decisional Balance for Mammography inventory; Demographic Inventory

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of intervention (small media, mass media, or others) and intervention

First Author and Country	Population	Classification of intervention (small media, mass media, or others) and intervention	Timeline	Outcome(s)
Ng ²⁶ Singapore	Characteristics: women from Singapore population registry 50-64 years old, no screening in the past 1 year or biopsy within 6 months, no cancer history, not pregnant Sample: n = 67,656 eligible women received invitations, n = 28,231 responded (IG); n = 97,294 were not invited (CG) Setting: nationwide	Small media Singapore Breast Cancer Screening Project IG: letter invitation for a free mammogram; if no reply: 2 follow-up letters CG: No invitation sent	Invitations were issued over 2 years, starting October 1994; one-off letter, follow-up letters sent the following 2 months Follow-up: data were collected for 2 years	Primary: effectiveness or mammography screening technique Secondary: detection of cancer; size and stage distribution of cancer, interval cancer rates Primary outcome was collected from medical records from National Breast Carcinoma Registry
Seow ²⁹ Singapore	Characteristics: women 50-64 years old, nonattending women who were invited once before for screening Sample: n = 1,500 were targeted (n = 500 in each group) Setting: nationwide	Small media Singapore breast cancer screening project (women who did not respond to first invitation were due their second reminder, as reported in Ng et al ⁶⁵) IG1: letter (invitation with screening date for a free mammogram and pamphlet with screening info) IG2: same as IG1 + educational folder mailed IG3: same as IG2 delivered by trained female field worker	Intervention was a one-off contact in December 1996 Follow-up: data were collected 5 weeks after designated appointment date	Primary: mammogram uptake Outcome was collected from medical records from National Breast Carcinoma Registry
Cervical cancer Rashid ^{17,18} Malaysia	Characteristics: women 20-65 years old, negative Papanicolaou test previous year Sample: n = 1,000 (n = 250 in each group) Setting: community clinics	Small media IG1: postal letter IG2: registered letter IG3: SMS IG4: telephone call (all IGs contained the date for a free Papanicolaou test and telephone number to reschedule)	Intervention was a one-off contact in June 2011 Follow-up: data were collected for 8 weeks after intervention	Primary: Papanicolaou test uptake Secondary: cost effectiveness Outcome was collected from the medical records from the Papanicolaou test program information system

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of intervention (small media, mass media, or others) and Intervention

First Author and Country	Population	Small media	Timeline	Outcome(s)
Abdullah ¹⁹ Malaysia	Characteristics: female teachers who did not attend Papanicolaou test in the past 3 years, reproductive age Sample: n = 403 at baseline; n = 398 at follow-up (IG: n = 199; CG: n = 199) Setting: workplace (public secondary schools)	Small media IG: (1) letter (invitation for a free Papanicolaou test) and pamphlet (information about cervical cancer and Papanicolaou test) hand delivered by school principal; (2) telephone call reminder (1x) after 4 weeks to reiterate importance of Papanicolaou test CG: no intervention (opportunistic screening)	Predata collection and intervention were conducted between January and November 2010 Follow-up: data were collected for 24 weeks after initial contact	Primary: Papanicolaou test uptake Outcome was collected through a self-reported questionnaire
Hou ^{27,28} Taiwan	Characteristics: women ≥ 30 years old (younger if married), no screening in past 1 year, family member of inpatients admitted to one of teaching hospitals in Taiwan (August-September 1999) Sample: n = 424 (baseline IG: n = 212; CG: n = 212; follow-up IG: n = 123; CG: n = 124) Setting: hospital	Small media IG: month 1: welcome letter, mailed educational brochure, quotes from women who completed Papanicolaou test, screening schedule; month 2: invitation letter for a free Papanicolaou test and mailed materials: facisheet, screening schedule, role model stories; month 3: telephone call from health educator to offer barriers counseling and/or assistance with appointment scheduling CG: monthly newsletter with general health information from hospital	Recruitment took place between August and September 1999; intervention duration was 3 months Follow-up: IG: during telephone call (pre) and mailed survey (post) CG: mailed survey (post only)	Primary: Papanicolaou test uptake Secondary: difference between early adopters and nonearly adopters Outcomes were collected through a self-reported questionnaire
Colorectal cancer				
Hagoel ²⁰ Israel	Characteristics: men and women 50-74 years old from national database, no history of inflammatory bowel disease or bowel malignancy, no colonoscopy in past 3 years; no FOBT in previous 1 year Sample: n = 48,091 (IG1: n = 9,631; IG2: n = 9,596; IG3: n = 9,630; IG4: n = 9,632; IG5: n = 9,602) Setting: nationwide	Small media All participants received (1) a mailed letter, asking them to mail back an FOBT test order form or pick up a free-of-charge FOBT at a local clinic and (2) an SMS reminder. Five types of letters were sent to different groups: IG1: interrogative reminders + no social context reference IG2: interrogative reminders + social context reference IG3: no reminder IG4: noninterrogative reminder + no social context reference IG5: noninterrogative reminder + social context	One-off letter was sent, followed by a one-off SMS 1 week later, in 2013 Follow-up: data were collected for 6 months after intervention	Primary: FOBT uptake Outcomes were collected from medical records from National Israeli Colorectal Cancer Early Detection database

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of intervention (small media, mass media, or others) and Intervention

First Author and Country	Population	Classification of intervention (small media, mass media, or others) and Intervention	Timeline	Outcome(s)
Hiral ²¹ Japan	Characteristics: men and women, 46-66 years old, no FOBT in past 1 year, membership in Japan's national health insurance program Sample: n = 2,140 eligible participants (IG1: n = 356; IG2: n = 355; CG1: n = 717; CG2: n = 712) Setting: community	Small media Mailed letter for substituted screening (4 types): IG1: tailored matched message condition, tailored and print reminder for screening IG2: tailored unmatched message condition and print reminder for screening (for IG1 and IG2: 3 different messages based on screening intention) CG1: typical message, professionally designed, and print reminder for screening CG2: typical message, not professionally designed, and print reminder for screening	First contact was made in Oct 2010, a second contact (reminder) was made in November 2010 Follow-up: data were collected for 5 months	Primary: FOBT uptake Secondary: cost-effectiveness Outcomes were collected from medical records from health care facilities
Colorectal and gastric cancer				
Hong ²² Korea	Characteristics: men 50-59 years old, in the lowest 50% of the National Health Insurance Corporation Premium, had not received cancer screening tests previously Sample: n = 923 in total (CG: n = 223; IG1: n = 230; IG2: n = 243; IG3: n = 227) Setting: community	Small media IG1: letter plus mailed information (screening eligibility, and free screening availability; information about cancer and screening; financial aid programs for patients with cancer) IG2: telephone call (counseling, same information as in IG1 conveyed, called up to 3 times) IG3: IG1 plus IG2 (letters were sent 2 weeks after telephone calls) CG: no intervention	Intervention was delivered during September 2012 Follow-up: data were collected for 4 months (1 month during intervention and for 3 months after intervention)	Primary: screening of stomach and colorectal cancer Outcome was collected from medical records from clinics
Quasi-experimental studies				
Breast cancer				
Adib ³¹ Lebanon	Characteristics: women ≥ 40 years old for survey 1 and 2 and ≥ 35 years old for surveys 3-5 from selected clusters Sample: n = 1,200 women (survey 1 and survey 2; different for surveys 3-5) Setting: community	Small media + mass media + others (1) discounted price for mammography (in 160 centers); (2) pamphlets in supermarkets, pharmacies, waiting rooms, salons, with clinics offering reduced price screening; (3) educational CD for health care professionals; (4) billboards, street signs, pink ribbons; (5) TV and radio advertisements; TV talk shows; (6) SMS advertisement; (7) campaign banners on homepages of main Internet providers	Intervention was delivered once a year (throughout October) 2002-2005 Data collection: data were collected once a year in January in 2004, 2005, and 2006	Primary: mammogram uptake Outcome was collected through a self-reported, tested questionnaire

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of intervention (small media, mass media, or others) and intervention

First Author and Country	Population	Classification of intervention (small media, mass media, or others) and intervention	Timeline	Outcome(s)
Gadgil ³⁴ India	Characteristics: women 30-69 years old employed at Bhaba Atomic Research Centre (and family members), enrolled in occupational health care scheme Sample: n = 22,500 Setting: workplace	Small media + others (1) mailed awareness brochures on annual basis (4x) about breast anatomy, signs and symptoms of breast cancer; (2) breast clinics by trained nurses; education, counseling, BSE; and physicians: clinical breast examination; (3) walk-in clinics to teach about breast changes with silicon model (all health care costs covered by employer)	Intervention was delivered once a year in June from 2013 to 2016 Data collection: Pre: January 2005-May 2013 Post: June 2013-June 2016	Primary: mammogram uptake Outcome was collected from medical records from occupational health care scheme
Heymann ³⁶ Israel	Characteristics: female members of Maccabi Healthcare Services, 40-65 years old Sample: n = 120,231 Setting: community	Small media + mass media + others (1) mailed information packs that discussed health, including breast cancer; (2) letter included in information pack asking participant to visit primary care physician who would discuss health prevention issues and refer her to appropriate tests; (3) mailed incentive: substantial discount on face cream when visiting physician; (4) 75 x 15-s TV ads	Intervention was delivered during March 2001 Data collection: Pre: March-April 1998, 1999, 2000 Post: March-April 2002, 2003	Primary: mammogram uptake Outcome was collected from medical records from Maccabi Health Care Services
Heo ³⁷ Korea	Characteristics: female students, workers, local residents; ≥ 19 years old, no history of breast cancer, smartphone owner Sample: n = 45 Setting: workplace or university	Mass media Smartphone application: reminder of optimal day to perform breast self-examination, motivational tools including participant's mother, record keeping, educational content	Intervention was delivered from mid-July to mid-September 2012 (approximately 2 months) Data collection: directly after intervention completion	Primary: breast self-examination practice Outcome was collected through self-reported questionnaire
Park ³⁹ Korea	Characteristics: female, 30-69 years old, permanent residents in intervention city Sample: n = 480 (IG: n = 240 and CG: n = 240) Setting: community	Small media + mass media + others Gumpo Cancer Screening Project IG: (1) posters on apartment billboards and in clinic waiting rooms and pharmacy; (2) leaflets (hand delivered) distributed at street events; (3) letters to promote breast cancer screening (free of charge to all); (4) street promotion; (5) outbound telephone calls to women who signed application form at street promotions; (6) monthly neighborhood meetings; (7) small group educational sessions; (8) online blog on breast cancer screening CG: no intervention	Intervention duration was 6-7 months Data collection: Pre: June 2008 Post: 7 months later	Primary: address barriers toward breast cancer screening, improve attitudes and beliefs; mammogram uptake Outcomes were collected through self-reported questionnaire (based on Health Belief Model and Transtheoretical Model)

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of intervention (small media, mass media, or others) and Intervention

First Author and Country	Population	Intervention	Timeline	Outcome(s)
Cervical cancer Guvenc ³⁵ Turkey	Characteristics: women ≥ 21 years of age, no gynecologic cancer history, no screening in past 1 year, living in study area, literate, sexually active, have telephone number Sample: stage I: n = 2,500; stage II: n = 302; stage III: n = 54 Setting: community	Small media + others Three Stages of Nursing Intervention: Stage I: mailed educational brochures and invitation to attend a free Papanicolaou test Stage II: telephone interviews Stage III: face-to-face interviews	Intervention was conducted in 2008 Data collection: pre and post (no time period or dates given)	Primary: Papanicolaou test uptake, knowledge and beliefs about Papanicolaou test Outcomes were collected through a self-reported questionnaire (sociodemographic information; Knowledge, Health Belief Model Scale for Cervical Cancer; and Papanicolaou test)
Ueda ³³ Japan	Characteristics: women 20-49 years old, residents of study area (IG: 20, 25, 30, 35, and 40 years old; CG: 21, 26, 31, 36, and 41 years old) Sample: n = 1,500-3,500 women in every age category, each year Setting: nationwide	Small media IG: mailed free cervical cancer screening coupon CG: no intervention	A one-off coupon was sent to all women in the applicable age category each year (2009-2012) Data collection: Pre: 2008 Post: 2009-2012	Primary: Papanicolaou test uptake Outcome was collected from medical records
Yag ³² Japan	Characteristics: IG1: women 20 years old; IG2: parents with daughters 20 years old, still living at home, no history of Papanicolaou test; CG: women 21 years old Sample: IG1: n = 1,976; IG2: n = 1,916 Setting: nationwide	Small media IG1: mailed free screening coupon and reminder postcard IG2: same as IG1 + leaflet to parents encouraging them to show their daughters a cartoon (encouraged girls to have a Papanicolaou test) CG: never received intervention	Intervention for IG1 was conducted in May 2013 and Jan 2014; intervention for IG2 was conducted in May 2014 and January 2013 Data collection: data were collected for 3 months	Primary: Papanicolaou test uptake Outcome was collected from medical records
Breast and cervical cancer				

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TABLE 3. Study Characteristics of Randomized Controlled Trials and Quasi-Experimental Studies (Continued)
Classification of Intervention (small media, mass media, or others) and Intervention

First Author and Country	Population	Classification of Intervention (small media, mass media, or others) and Intervention	Timeline	Outcome(s)
Tabuchi ⁴¹ Japan	Characteristics: IG: women 20, 25, 30, 35, and 40 years old for Papanicolaou test and 40, 45, 50, 55, and 60 years old for mammography; CG: female, \geq 1 year old; IG: \geq 2 years old Sample: IG: between n = 1,465 and n = 2,000; CG: between n = 5,638 and n = 8,247 Setting: nationwide	Small media IG: free cervical or breast screening vouchers were distributed (usually by mail but occasionally by hand) and mailed information leaflets CG: no intervention	One-off voucher (+ leaflet) was sent between September 2009 and March 2010 Data collection: Pre: 2007 Post: 2010	Primary: (1) Papanicolaou test uptake; (2) mammogram uptake Secondary: cost per uptake Outcomes were collected through a self-reported questionnaire (Comprehensive Survey of Living Conditions of People on Health and Welfare)
Oral cancer				
Motallebnejad ³⁸ Iran	Characteristics: participants living in selected clusters (no other criteria stated) Sample: pre: n = 400; post: n = 226 Setting: community	Small media Information brochure on oral cancer facts (hand delivered by students) after brief baseline questionnaire was completed with participants	One-off brochure was delivered in 2005 Data collection: Pre: directly before brochure was given Post: 1 month after intervention	Primary: knowledge about oral cancer Outcome was collected through self-reported questionnaire
Saleh ¹⁰ Malaysia	Characteristics: registered e-mail address with media company (database of > 2 million contacts) Sample: contacted pre: n = 75,559; post: n = 40,351; respondents: n = 669 (pre) and n = 757 (post) Setting: nationwide	Mass media (1) 20-s TV ads (aired for 32 days, 2-3x per day on TV3, NTV7); (2) TV talk show (2x) by surgeon at the end of intervention period to address emotional barriers faced by patients in seeking treatment	Intervention was delivered from May 23 to June 23, 2010 (32 days) Data collection: directly before and after intervention	Primary: awareness of oral cancer Outcome was collected through self-reported online survey

Abbreviations: BSE, breast self-examination; CG, control group; FOBT, fecal occult blood test; IG, intervention group; SMS, short message service (text message).

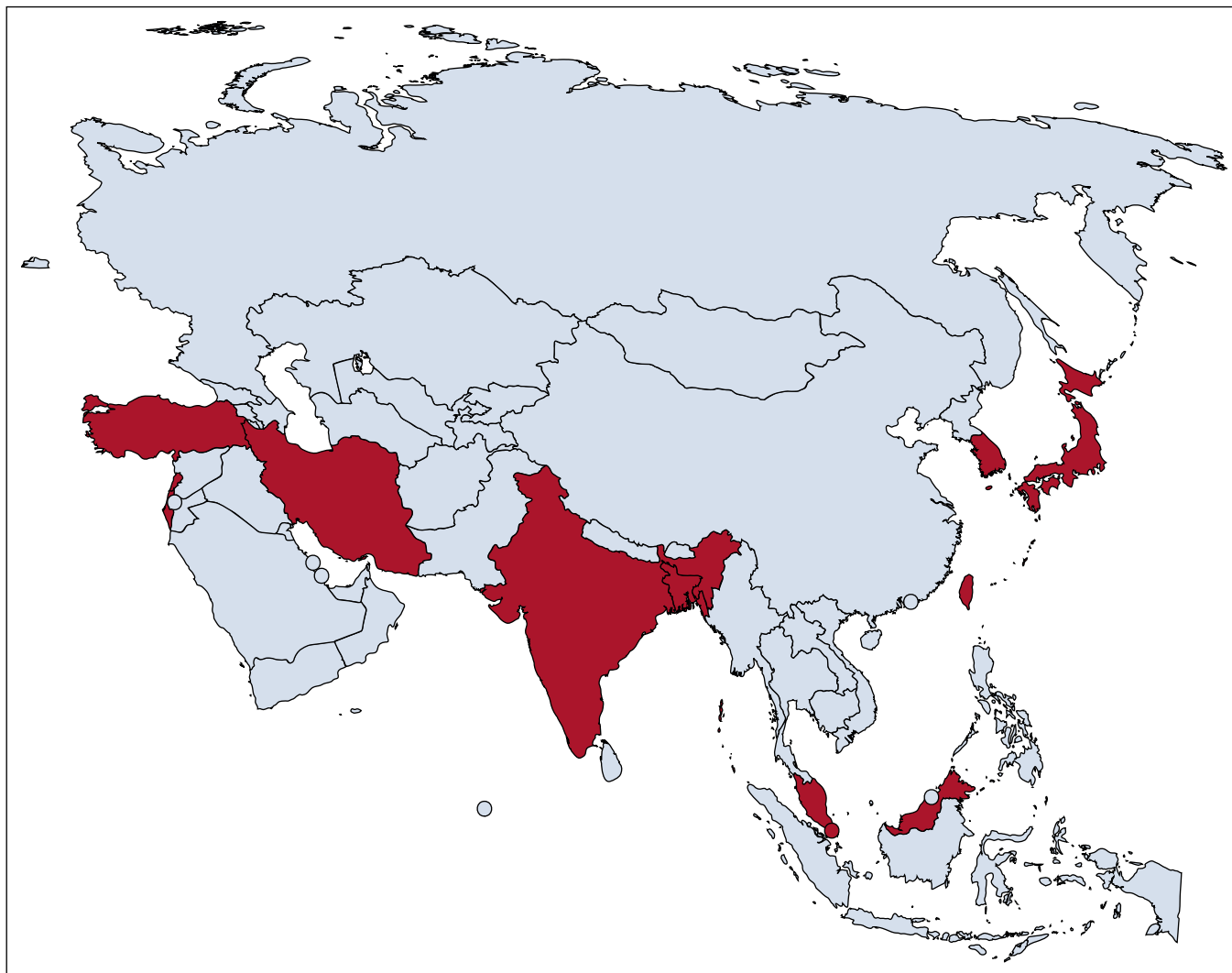


FIG 2. Map of Asia, highlighting countries included in interventions identified as part of this systematic review.

one exception³⁷). Colorectal and gastric cancer studies included participants between 46 and 74 years of age, and oral cancer studies did not use age as an exclusion criterion. Most studies that aimed to increase screening rates included participants who did not attend screening in the past 1 to 3 years.

Intervention. All RCTs of interventions used small media only (Table 3). The most common channel of communication was mailed letters, generally with the purpose of inviting participants to cancer screening. Sometimes the letters were mailed with brochures or other educational materials regarding cancer. Other small media communication channels were telephone calls and text messages (Short Message System). The RCTs included between one and four intervention groups (IGs), either comparing different channels of communication to a control group (CG) or comparing different types of messages delivered through the same channel of communication.

Included QESs used both mass and small media channels, as well as intervention components such as counseling or group education (Table 3). Two studies evaluated the impact of TV advertisements and a TV talk show,⁴⁰ as well as a smartphone application.³⁷ Three studies combined mass media (ie, TV ads, billboards, posters, street signs, radio advertisements, and a Web site) and small media communication channels, together with intervention components such as counseling, group education, discounted or free-of-charge screening, and neighborhood meetings.^{19,36,39} Four studies included small media only,^{20,21,38,41} and two studies included small media and other communication channels.^{34,35} Small media channels used in QESs included mailed letters or postcards, mailed coupons, mailed brochures or other educational materials, mailed cartoons, telephone calls, and an educational CD or video.

The few interventions that seemed to be informed by behavior change theory used constructs from the Health Belief Model,^{31,32,35,39} the Transtheoretical Model,^{17,39} and

the Theory of Planned Behavior.^{26,28} One intervention was based on the Question–Behavior Effect technique,²⁵ and another was developed according to the PRECEDE/PROCEED model.³⁹ Few studies described the involvement of their target population in designing the intervention, although the needs assessment of the target population was described mainly in studies that used a behavior change theory.^{17,35,39}

Small media studies generally targeted people in their homes, with the exception of one study that invited participants to the research center.¹⁷ Addresses were commonly obtained from health and population registries targeting large numbers of people (Tables 1 and 3). Other recruitment methods included convenience sampling within housing areas,^{38,39} hospitals (visiting relatives),^{31,32} or workplaces,^{34,36,37} or an e-mail list held by a mass media organization.⁴⁰

The intervention duration and follow-up period differed among types of studies and outcomes of interest (Tables 1 and 3). Most small media interventions delivered a one-off letter or text message or followed up with a second letter, text message, or telephone call between 1 week and 3 months later and collected data on cancer screening uptake between 5 weeks and 12 months after the intervention. Other interventions posted annual brochures for up to 3 years.³⁴ Small media campaigns focusing on improving cancer knowledge and perceptions conduct evaluations directly after the intervention or 1 month after.³⁸ Mass media campaigns lasted from 1 month for TV only⁴⁰ to 3 months for a smartphone application intervention only.³⁷

Researchers, staff working in clinics and government screening programs, or students delivered the interventions. Trained nurses, physicians, and other clinicians undertook the screening, which was free of charge with the exception of two studies in which screening was discounted.^{19,26} Most of the studies were funded by universities and research centers.^{22,23,26,33,34,37,39,42} Other funding bodies were a pharmaceutical company,¹⁹ a national cancer association (nongovernmental organization [NGO]),²⁵ a nursing association,¹⁷ a media company,⁴⁰ a Ministry of Health (government),^{20,21,26–28,30,41} a health insurance plan, a hospital,^{31,32} and one campaign was retail-pharmacy sponsored.³⁶ The funding source was unclear in two studies.^{35,38}

Study Findings

All findings are reported in Table 4.

Cancer-related knowledge, attitudes to cancer screening, and self-examination practice. Change in cancer-related knowledge was assessed in one RCT and four QESs, all of medium quality.^{31,32,35,38–40} Findings from the RCT conducted by Hou et al³¹ found no between-groups difference in knowledge regarding cervical cancer and Papanicolaou tests at follow-up. Conversely, Park et al³⁹ found that a mixed media campaign (small and mass media plus other components) demonstrated a greater decrease in beliefs

about breast cancer–related myths in Korea (non-significant). Furthermore, a before-and-after evaluation of a mass media campaign in Malaysia found an increase in awareness about oral cancer (ie, having heard of oral cancer), but there was no increase in knowledge about symptoms.⁴⁰ Findings across five studies (two RCTs and three QESs) of attitudes toward screening concerning breast^{17,37,39} or cervical cancer were mixed.^{31,32,35} Studies addressing attitudes or beliefs about cancer generally described an underlying theory for the intervention design. For example, Park et al reported that a mixed media intervention based on the Transtheoretical Model, resulted in an increase in the proportion of intervention participants who progressed to the action stage (+23% in the intervention city v –5% in the control city) and an increase in intention to undergo mammography screening in the next 2 years (+14% in the intervention city v +7% in the control city).³⁹ The small media intervention (combined with face-to-face interviews in stage III) that was based on the Health Belief Model did not find a change in beliefs related to cervical cancer and H tests.³⁵ A small study using a smartphone application did not find a change in breast self-examination practice in general, although there was a significant increase in the number of women 30 years of age or younger conducting breast self-examination (36% to 82%, $P = .002$).³⁷

Screening attendance, cancer diagnosis, and downstaging.

Screening uptake was the most commonly reported outcome measure ($n = 17$) for breast, cervical, and colorectal cancer. Findings from RCTs were mixed for breast ($n = 4$ [medium quality]) and colorectal cancer screening ($n = 3$ [medium quality]) and positive for cervical cancer screening ($n = 3$ [medium to high quality]). Only one RCT looked at gastric cancer screening.²⁷ Ishikawa et al²⁶ reported that a tailored letter about free breast cancer screening was significantly more effective than a non-tailored reminder (odds ratio, 4.02 [95% CI, 2.67 to 6.06]; $P < .001$). Conversely, a repeated text message screening invitation combined with information about mammograms was as effective as receiving a screening invitation through text message alone.²⁹ Medium- and low-quality QESs reported weak positive effects on breast cancer screening.^{131,34,36,41} According to one QES, breast cancer screening uptake increased over a 4-year period (not significant),¹⁹ and Heymann et al³⁶ reported a small increase, from 3.2% to 3.8%, in another QES. High- and medium-quality QESs reported significant positive effects for cervical cancer screening,^{20,21,35,41} which were supported by high- and medium-quality RCTs.^{22,24,31} For example, Abdul Rashid et al²² reported a significantly greater uptake of Papanicolaou tests in the IG invited by telephone compared with a mailed letter, a registered letter, or a text message (50.9%, 23.9%, 23.0%, and 32.93%, respectively; $P < .05$). Similarly, a mailed screening invitation and information followed by a telephone reminder yielded

TABLE 4. Findings Regarding Cancer-Related Knowledge, Attitudes, and Beliefs and Screening Uptake

First Author	Change in Knowledge	Change in Attitudes and Beliefs	Screening Uptake	Cancer Cases Detected	Downstaging of Cancer	Cost Effectiveness
Randomized controlled trials						
Breast cancer						
Ishikawa ^{28a}	—	—	IG v CG ^b	—	—	IG v CG ^c
Lakkis ^{29a}	—	—	IG1 v IG2 ^d	—	—	—
Lin ^{17e}	—	IG v CG ^b	—	—	—	—
Ng ^{30a}	—	—	f	IG v CG ^b	IG v CG ^b	—
Seow ^{33a}	—	—	IG3 v IG1 ^b IG3 v IG2 ^b IG3 v IG2 ^b	—	—	—
Cervical cancer						
Abdul Rashid ^{22,23e}	—	—	IG4 v all ^b	—	—	IG4 v all ^c
Abdullah ^{24a}	—	—	IG v CG ^b	—	—	—
Hou ^{31,32a}	IG v CG ^d	IG v CG ^b (more pros) IG v CG (fewer cons) ^c	IG v CG ^b	—	—	—
Colorectal cancer						
Hagoel ^{25a}	—	—	IG1 and IG2 v all ^c	—	—	—
Hirai ^{26a}	—	—	IG1 v CGs ^b IG1 v IG2 ^d	—	—	Not justified ^d
Colorectal and gastric cancer						
Hong ^{27a}	—	—	IG2 v CG ^b IG3 v CG ^b IG1 v CG ^d	—	—	—
Quasi-experimental studies						
Breast cancer						
Adib ^{19g}	—	—	S3 and S4 v S1 and S2 ^c	—	—	—
Gadgil ^{34a}	—	—	f	f	Post v pre ^c	—
Heymann ^{36a}	—	—	IY v other Ys ^c	—	—	—
Park ^{39a}	IG v CG ^c	IG v CG ^b	—	—	—	—
Heo ^{37a}	—	Pre v post ^d Age ≤ 30 years ^b Age > 30 years ^h	—	f	—	—
Cervical cancer						
Guvenc ^{35a}	After S1 ^b	d	b	—	—	—
Ueda ^{21e}	—	—	IY v other Ys ^b	—	—	—
Yagi ^{20e}	—	—	IG v CG ^b	—	—	—
Breast and cervical cancer						
Tabuchi ^{41a}	—	—	IG v CG ^b	—	—	d
Oral cancer						
Motallebnejad ^{38a}	Pre v post ^b	—	—	—	—	—

(Continued on following page)

TABLE 4. Findings Regarding Cancer-Related Knowledge, Attitudes, and Beliefs and Screening Uptake (Continued)

First Author	Change in Knowledge	Change in Attitudes and Beliefs	Screening Uptake	Cancer Cases Detected	Downstaging of Cancer	Cost Effectiveness
Saleh ^{40a}	Awareness of oral cancer ^b Symptom awareness ^d	—	—	—	—	—

Abbreviations: CG, control group; IG, intervention group; IY, intervention year; S1, stage I; S2, stage II; Y, year; —, not applicable (not reported).

^aMedium quality.

^bSignificant positive difference.

^cPositive difference (not significant).

^dNo difference.

^eHigh quality.

^fFindings not conclusive.

^gLow quality.

^hNegative difference.

a significantly higher Papanicolaou test uptake compared with no intervention (opportunistic screening; odds ratio, 2.44 [95% CI, 1.29 to 4.62]).²⁴ High-quality QESs found a significant increase in Papanicolaou test uptake among IG participants compared with the CG (8.7% v 3.6%; $P < .001$)²⁰ and an increase in the first-time participation screening rate²¹ as a result of small media interventions (mailed screening coupons) in Japan. RCT participants who received a telephone call alone or a call combined with mailed information were significantly more likely to attend gastric and colorectal cancer screenings compared with the respective CGs (gastric cancer: telephone, 31.7% v 17.9%, $P = .01$; telephone plus post, 40.5% v 17.9%, $P < .01$; Colorectal cancer: telephone, 24.3% v 13.5%, $P < .01$; telephone plus post, 27.8% v 13.5%, $P < .01$).²⁷

Detected cancer cases were reported in three studies. A medium-quality RCT of a small media intervention found a significant between-group difference in terms of breast cancer cases detected (IG, 4.8 of 1,000 cases v CG, 1.3 of 1,000 cases),³⁰ whereas the interventions in two medium-quality QESs did not increase cancer case detection.^{34,37} Two medium-quality studies assessed downstaging of detected cancers as an outcome. Ng et al³⁰ demonstrated a significant difference in stage of breast cancer diagnosis as a result of a small media intervention in Singapore (IG, 64% v CG, 26% of cases were stage 0 or 1, $P < .001$), whereas Gadgil et al³⁴ reported that the proportion of smaller-sized tumors detected was higher (85.3% v 89.5%, $P = .390$) and the proportion of large-sized tumors detected was smaller (14.7% v 10.5%, $P = .390$) after the intervention. Furthermore, the proportion of cancer deaths decreased from 8.3% to 0% within 3 years from diagnosis over the study period.

Cost effectiveness. Four studies reported intervention costs, with mixed findings. An intervention using assessment-based, tailored screening reminder letters to improve breast cancer screening was cost effective compared with nontailored reminders (IG, 30 USD v CG, 52 USD),²⁸ whereas a tailored message condition was not more cost

effective than an unmatched message condition for colorectal cancer screening.²⁶ Abdul Rashid et al²³ compared different small media campaigns to increase cervical cancer screening and found that a telephone call was the most cost-effective method. An intervention that paid out-of-pocket costs for breast and cervical cancer screenings in Japan improved cancer screening uptake, although the intervention was not cost saving because of the high cost of screening.⁴¹

DISCUSSION

Findings from this systematic review suggest that small media interventions (eg, interventions using mailed materials, text messages, and telephone calls) may be effective in improving screening uptake for breast, cervical, colorectal, and gastric cancer in Asian countries. The number of studies using mass media channels was too small to draw conclusions about their effectiveness. There was also insufficient evidence to indicate that small or mass media campaigns improved knowledge or attitudes toward cancer. The lack of mass media campaigns is likely to be related to (1) the high costs involved in running campaigns using TV and radio advertisements and (2) the lack of campaign evaluation of campaigns run by the government and NGOs. The only nationwide mass media campaigns included here received funding from media channels for TV advertisements.

The findings regarding screening were mainly from studies conducted in high or higher middle-income countries (Japan, South Korea, Taiwan, Singapore, Malaysia, Israel, Turkey, Lebanon, and Iran). The absence of studies in low and lower middle-income countries may be explained by a lack of resources to conduct screening programs, as well as a lack of screening facilities. Most studies reported a one-off follow-up, and only a few studies evaluated the impact of such programs in the long term. Studies from Western countries suggest that screening programs have to be run repeatedly to maintain uptake over time.⁴³

Surprisingly, the two most common cancers in Asia, lung and liver cancer, were not addressed by any study in the systematic review. The majority of lung and liver cancer programs tend to focus on prevention (ie, smoking cessation and hepatitis B vaccination) instead of symptom education and early detection. However, the high number of lung and liver cancer cases suggests that there is a need for early detection and awareness programs to supplement prevention programs and to detect and treat these cancers early. The under-researched number of cancer cases detected and downstaging of cancer may be related to the poor quality or absence of adequate data collection systems in LMICs. Bhoo-Pathy et al⁴⁴ reported that only one in three Asian countries collected data on cancer incidence, and only one in six countries monitored cancer mortality. In turn, inadequate or absent routine data collection is likely to hinder cost-effectiveness analysis of interventions.

Eight studies (40%) reported implementation issues. Findings highlighted that between 21.2% and 34.4% of letters, mailed brochures, or text messages were never received because of incorrect addresses or telephone numbers^{22,29} and that approximately 43.5% of targeted participants never read the brochure they received.³⁸ One study using mass and small media highlighted that 50% of participants reported that they had heard about the campaign.¹⁹ Reasons why women refused free cervical cancer screening after the first contact included no time and embarrassment during screening.³⁵

Findings presented in this systematic review are in line with the findings of two systematic reviews focused mainly on Western countries.^{15,43} Furthermore, Hou et al¹² concluded that small media were effective in improving screening uptake among Asians (including Asians living abroad). To the best of our knowledge, the systematic review presented in this article is the first review focusing on Asians living in Asia and takes account of the different health care systems and resources in Asian countries compared with Western countries. In addition, the review extracted information about small and mass media campaigns specifically, rather than educational interventions in general; these data will be informative for the design and development of early detection cancer programs that plan to use this mode of delivery.

To the best of our knowledge, this systematic review delivers the best available up-to-date reliable evidence about small and mass media cancer screening interventions in Asia. Most studies in this systematic review were deemed to be of medium quality according to the results of the application of the JBI methodologic checklists. However, a consideration of individual studies in the context of the target interventions might suggest that some may be higher in methodologic quality. For example, the scoring of criteria such as blinding may not be realistic for these types of population-based educational interventions.

Often, data collected from medical records or cancer registries in LMICs are not complete or reliable because of a lack of resources. For example, the cancer registry in Malaysia relies on voluntarily supplied information,⁴⁵ and because of the dual-tiered health care system, evidence from private clinics and hospitals is often lacking. Many interventions and campaigns run by governments and NGOs in LMICs are evaluated internally and are not published in scientific journals and, therefore, may be missed.

Few of the studies included offered minimal contact with participants (eg, neighborhood meetings, telephone contact, and so forth) and we do not know the extent to which this personal contact is important for intervention success. Due to the limited number of studies, no conclusions can be drawn about whether interventions that applied a theory were more effective than atheoretical studies or whether there are differences in effectiveness between screening tests. However, a recent systematic review by Senore et al⁴³ suggested that different colorectal cancer screening methods yielded different results regarding screening uptake.

Because some studies compared one intervention with another intervention (eg, tailored messages v nontailored messages), no conclusions can be drawn from some interventions regarding the effectiveness of the intervention compared with no intervention. Our review covered a limited number of high and higher middle-income countries, and findings may not be applicable to other LMICs in Asia (Fig 2). Furthermore, few studies looked at using different methods to target different age groups. However, it was suggested that younger women may be better disposed to smartphone applications³⁷ as well as to being influenced by their parents.

Mailed information and an invitation for a free screening, as well as mailed information combined with a telephone reminder, seem to be effective in increasing screening uptake. High-quality studies in this review may serve as important resources to inform screening interventions in Asian countries. A limited number of interventions in this systematic review evaluated screening programs over an extended time period, and future studies should investigate screening engagement in the long term.⁴³

Few studies addressed knowledge and attitudes regarding cancer and cancer screening. However, in some LMICs, lack of knowledge, misbeliefs, negative attitudes toward cancer treatment, and distrust in Western medicine are still significant barriers toward screening,^{46,47} and these barriers must be addressed to improve screening uptake in Asia. Understanding barriers toward screening in the target population is a key research goal,⁴³ and basing interventions on theoretical components may improve effectiveness. The two most commonly applied theories in cancer education programs in Asia are the Transtheoretical Model and the Health Belief Model.¹²

Mass media campaigns are run yearly by NGOs and industry,⁴⁸ but they do not seem to be subject to rigorous evaluation. To identify whether mass media are cost effective and worthwhile to be used by policy makers and public health practitioners for public education in Asia, there would be considerable merit in NGOs and campaigning bodies exploring collaboration with academicians with a view to rigorously evaluating public health improvement programs.

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Findings from this systematic review suggest that small media cancer awareness-raising campaigns are effective in increasing cancer screening rates for breast and cervical cancer, and limited evidence is available for colorectal cancer. Evaluation of mass media campaigns is required to improve understanding about the importance (or otherwise) of these campaigns in public health education. Additional research is needed to assess the cost effectiveness of media interventions for cancer screening in Asia.

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APPENDIX

TABLE A1. Concepts Searched in the Databases

Concept 1: Cancer, neoplasm
Concept 2: Screening, breast health, awareness, knowledge, self-screening, beliefs, attitudes, self-efficacy, self-examination, attendance, health behavior
Concept 3: Mass media, small media, campaigns, health promotion, health education, public health, interventions, programs, TV, radio, mail, brochures, (print) advertisement, social media, Internet, online
Concept 4: Asia, Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, Cyprus, Georgia, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar (Burma), Nepal, North Korea, Oman, Pakistan, Palestine, Philippines, Qatar, Russia, Saudi Arabia, Singapore, South Korea, Sri Lanka, Syria, Taiwan, Tajikistan, Thailand, Timor-Leste, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen

NOTE. Search terms for each concept were combined with OR. All four search concepts were combined with AND.