Inreach and outreach interventions to improve mammography use
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Authors' objectives
To assess the effectiveness of patient-targeted interventions in increasing mammography use when performed outside (outreach) or inside (inreach) the primary care medical setting.

Searching
MEDLINE was searched for papers published in the English language between 1980 and 2001. The following subject terms were used: 'health behaviour', 'patient compliance', 'patient acceptance of health care', 'attitude of health', 'health education', or 'health promotion', combined with the title terms 'mammogram' or 'mammography'. The reference list of retrieved studies, published reviews, and meta-analyses were also reviewed. The journals Preventative Medicine, American Journal of Preventative Medicine, and Cancer Epidemiology, Biomarkers and Prevention were handsearched for the period January 2000 to February 2001.

Study selection
Study designs of evaluations included in the review
Only prospective randomised or concurrent controlled trials were included. Pre-test post-test designs without control groups were excluded. Published abstracts and studies conducted outside of the USA were also excluded.

Specific interventions included in the review
Any intervention designed to increase mammography use. The interventions examined by the included studies were classified by setting (inreach or outreach), mechanism of action (behavioural, cognitive, sociologic, or a combination), the type of control group (active or usual care), the number of strategies, and the mode of delivery (static or interactive).

Behavioural interventions were defined as those that change stimuli associated with mammography use; the majority of the included studies used reminder letters or phone calls to patients, and two used vouchers. Cognitive interventions were defined as those that provide new information and educate women about mammography, and clarify existing misperceptions; the majority of the included studies used theory-based or individually tailored education as a component of letters brochures, videotapes or telephone counselling. Sociologic interventions were those that use social norms or peers to increase mammography use; the majority of the included studies examined strategies that used lay health workers or other peer counsellors to promote mammography use as a component of the intervention. The majority of the included studies that examined a combination of behavioural and cognitive interventions examined outreach interventions with theory-based educational components.

Reference standard test against which the new test was compared
The review did not include any diagnostic accuracy studies that compared the performance of the index test with a reference standard of diagnosis.

Participants included in the review
Adult women eligible for mammography screening. Only studies that included interventions targeted at patients were included, i.e. interventions that targeted providers were excluded. Most of the included studies were performed in populations that looked at women aged 50 years or older.

Outcomes assessed in the review
Only trials that used mammography uptake as an outcome measure were considered. The most common outcome measure for the included studies was patient self-report of mammography.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed
Assessment of study quality
No systematic assessment of validity was undertaken.

Data extraction
Data were abstracted from the studies using a standardised abstraction form to describe the intervention setting, type of intervention, means of determining mammography outcome (e.g. self-report, chart), characteristics of the patient population, and intervention effectiveness. Each intervention within a study was abstracted separately. The effect sizes and 95% confidence intervals (CIs) were calculated for each intervention. The authors do not state how many of the reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were pooled using a random-effects model (DerSimonian and Laird). Sensitivity analyses were performed by sequentially eliminating single studies and recalculating the summary effect size, CI and Q statistic.

How were differences between studies investigated?
Within each group of interventions, the effect size and 95% CI for each intervention were plotted graphically, and the graphs were inspected visually for signs of heterogeneity. Homogeneity within each group was also assessed statistically using the Q statistic and chi-squared distribution.

Results of the review
Sixty-six studies (37 inreach and 29 outreach) with 98 separate interventions were included. Forty-four studies were randomised controlled trials (RCTs) and 12 were concurrently controlled studies.

For the following summary results, positive values favour the intervention (representing the percentage increase in mammography use) and negative findings favour the control (percentage decrease in mammography use).

Behavioural interventions.
Vouchers: the effectiveness of inreach interventions (2 studies, 199 patients) was 45.2% (95% CI: 22.1, 68.2; Q=4.0).
Usual care controls: the effectiveness of inreach interventions (7 studies, 2,421 patients) was 16.4% (95% CI: 9.2, 23.6; Q=37.1).
Single intervention with active controls: the effectiveness of inreach interventions (6 studies, 5,181 patients) was 4.6% (95% CI: -0.3, 9.4; Q=17.3).
Multiple interventions with active controls: the effectiveness of inreach interventions (3 studies, 3,693 patients) was 14.0% (95% CI: 8.7, 19.2; Q=4.9), while that for outreach interventions (3 studies, 469 patients) was 18.7% (95% CI: 4.9, 32.4; Q=5.5).

Cognitive interventions.
Generic education: the effectiveness of inreach interventions (6 studies, 3,280 patients) was 1.4% (95% CI: -3.4, 6.3; Q=12.0), while that for outreach interventions (2 studies, 583 patients) was 1.8% (95% CI: -2.9, 6.2; Q=4.2).
Theory-based education with usual care controls: the effectiveness of inreach interventions (1 study, 101 patients) was 5.7% (95% CI: -12.6, 24.0), while that for outreach interventions (4 studies, 1,979 patients) was 12.7% (95% CI: 6.6, 18.8; Q=7.3).
Theory-based education with usual active (static) controls: the effectiveness of inreach interventions (5 studies, 3,255 patients) was 3.5% (95% CI: -0.5, 7.5; Q=9.1), while that for outreach interventions (2 studies, 2,091 patients) was 2.7% (95% CI: -1.5, 6.8; Q=1.8).

Theory-based education with usual active (interactive) controls: the effectiveness of inreach interventions (9 studies, 5,889 patients) was 10.7% (95% CI: 6.8, 14.7; Q=26.7), while that for outreach interventions (2 studies, 850 patients) was 19.9% (95% CI: 10.6, 29.1; Q=1.6).

Cognitive and behavioural interventions.

Generic education: the effectiveness of inreach interventions (1 study, 178 patients) was -10.3% (95% CI: -23.0, 2.4).

Theory-based education with usual care controls: the effectiveness of inreach interventions (2 studies, 719 patients) was 14.0% (95% CI: 7.9, 20.2; Q=0.50), while that for outreach interventions (2 studies, 575 patients) was 27.3% (95% CI: 14.7, 40.0; Q=3.1).

Theory-based education with active controls: the effectiveness of outreach interventions (5 studies, 3,503 patients) was 2.7% (95% CI: -2.0, 7.4; Q=11.7).

Sociologic interventions: the effectiveness of inreach interventions (3 studies, 2,115 patients) was 10.7% (95% CI: 3.4, 18.0; Q=5.6), while that for outreach interventions (5 studies, 5,367 patients) was 9.1% (95% CI: 1.7, 13.3; Q=9.1).

Sociologic and behavioural interventions: the effectiveness of inreach interventions (1 study, 460 patients) was 22.0% (95% CI: 14.1, 29.9).

Sociologic and cognitive interventions: the effectiveness of outreach interventions (3 studies, 7,690 patients) was 3.2% (95% CI: 1.3, 5.1; Q=1.4).

Sociologic, behavioural and cognitive interventions: the effectiveness of outreach interventions (4 studies, 1,222 patients) was 12.3% (95% CI: 3.1, 21.4; Q=10.0).

Authors’ conclusions

Inreach and outreach interventions to increase mammography use were similarly effective within intervention categories, based on the mechanism of action, mode of delivery, and type of control group. Ultimately, decisions about intervention strategies will depend on the characteristics of the target population, practical considerations, and relative cost-effectiveness.

CRD commentary

The review addressed an appropriate question using clear inclusion and exclusion criteria, but was limited to studies undertaken in the USA. MEDLINE was the only database that was searched and no attempt was made to identify unpublished studies, therefore some important information may have been missed. No information was presented on how decisions were made on the inclusion of primary studies, for example the number of reviewers involved and how disagreements were resolved. In addition, it was not stated how many of the reviewers extracted the data. The validity of the included studies was not assessed systematically.

The information presented on the included studies and participants was fairly limited, but this was probably due to the large number of included studies. Heterogeneity between the studies was investigated and a random-effects model was used to pool the data. A sensitivity analysis was used to examine the potential source of heterogeneity, by excluding each study in turn. The authors noted that 98 separate interventions (from 66 studies) were included in the meta-analysis, but only 78 were listed in the summary results table.

Implications of the review for practice and research

The authors did not state any implications for further research and practice.
Funding
The National Cancer Institute, grant numbers R01 CA72908, CISNET U01CA88283A, T32CA09314, DAMD 17-97-1-7131 and R03 CA833802.

Bibliographic details

PubMedID
11759785

Indexing Status
Subject indexing assigned by NLM

MeSH
Breast Neoplasms /prevention & control; Community-Institutional Relations; Female; Health Education; Humans; Mammography /utilization; Patient Acceptance of Health Care /psychology; Persuasive Communication; Preventive Health Services /utilization; Primary Health Care; United States

AccessionNumber
12002005258

Date bibliographic record published
31/03/2003

Date abstract record published
31/03/2003

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.