A meta-analysis of interventions to promote mammography among ethnic minority women
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CRD summary
The authors concluded that findings suggested a need for increased use of a therapy-based tailored approach with enhancement of access to improve mammography screening rates among women from ethnic minorities. The review was generally well-conducted, but the conclusions were based on subgroup analyses of diverse studies of uncertain quality and should be interpreted with caution.

Authors' objectives
To evaluate the effectiveness of interventions aimed at increasing mammography screening rates in asymptomatic ethnic minority women in USA.

Searching
MEDLINE, CINAHL, PsycINFO and Web of Science were searched for studies published in English from 2000 to August 2008. Key words were reported. Reference collections were handsearched. The year 2000 was selected as the search start date because a previous review had included studies published up to this date (see Other Publications of Related Interest).

Study selection
Experimental and quasi-experimental studies that evaluated interventions aimed at increased mammography screening rates in asymptomatic women were eligible if more than 40% of women had an ethnic minority background and adherence to mammography screening was assessed using self report, clinical database or medical records. Interventions could be used alone or in combination with other health behavioural interventions. The focus was on women in USA and international studies were excluded.

Included studies used single or multiple intervention strategies. Studies most commonly evaluated individually directed interventions that used print materials followed by education, support or telephone counselling; other studies evaluated enhanced access (such as low or no cost mammography, mobile vans or vouchers), social network, community education and mass media interventions. Most interventions were based on theory, most were not tailored and most were community based. Most included some form of cultural strategy; some provided culturally matched intervention materials or ethnically matched intervention delivery. Participants included African Americans, Asian Pacific Islanders and Hispanics. Most controls were no intervention or usual care; other controls used minimal intervention or other active non-breast intervention. Most studies used self report to record screening uptake.

Two reviewers independently selected studies.

Assessment of study quality
Two reviewers independently assessed and scored validity based on study design (randomised or not), outcome measures (subjective or objective), clarity of outcome definition (none or clear) and information about withdrawals (not clear or numbers and reasons reported for each treatment group). Studies that scored 1 or 2 out of the maximum 4 points were classified as low quality; studies that scored 3 or 4 were classified as high quality. Disagreements were resolved by discussion with other members of the review team.

Data extraction
For each study, proportions of women who underwent mammography screening in treatment and control groups were extracted and the difference in post-intervention screening rates was calculated as an effect size (d).

Two reviewers independently extracted data. Disagreements were resolved by discussion with other members of the review team.
**Methods of synthesis**

Pooled weighted mean effect sizes (WMES) and 95% confidence intervals (CI) were calculated using a fixed-effect model; studies were weighted by the inverse variance method. Heterogeneity was assessed using the DerSimonian and Laird model Q statistic. The random-effects DerSimonian and Laird model was used when significant heterogeneity was found.

Sensitivity analyses were used to examine the influence of each potentially influential study and study quality (high- and low-quality studies were analysed separately). Subgroup analyses were conducted to examine the effects of intervention characteristics, setting and ethnic group. The possibility of publication bias was explored using a funnel plot and Rosenthal’s fail-safe N.

**Results of the review**

Twenty-three studies were included (n=22,849 patients); 61% were randomised controlled trials (RCTs). Sample size ranged from less than 100 to more than 5,000. Nine studies were classified as high quality and 14 were classified as low quality.

Overall interventions were associated with a statistically significant increase in mammography screening rates compared to control (effect size using random-effects model 0.078, 95% CI 0.043 to 0.113). Significant heterogeneity was found (p<0.001).

The intervention type with the largest effect size was access-enhancing strategies (effect size 0.155, 95% CI 0.087 to 0.223; six studies) followed by individually directed strategies (effect size 0.099, 95% CI 0.073 to 0.110; 19 studies).

Tailored therapy-based interventions were associated with a larger effect size (0.101, p<0.001; four studies) than non-tailored interventions (0.076, p<0.001; 19 studies).

Ethnically matched interventions had an effect size of 0.067 (95% CI 0.015 to 0.120; 14 studies) and culturally matched interventions had an effect size of 0.051 (95% CI 0.009 to 0.092; 15 studies).

High-quality studies had an effect size of 0.099 (95% CI 0.076 to 0.122; nine studies) and low-quality studies an effect size of 0.061 (95% CI 0.008 to 0.114, 14 studies).

The funnel plot was slightly asymmetrical, but the fail-safe N value of 411 suggested that review findings were robust.

**Authors’ conclusions**

Review findings suggested a need for increased use of a theory-based tailored approach with enhancement of access to improve mammography screening rates among women from ethnic minorities.

**CRD commentary**

The review question was clearly stated and inclusion criteria were appropriately defined. Several relevant sources were searched. No attempts were made to minimise publication bias; publication bias was assessed and deemed to have no significant effect. The restriction to English-language publications was appropriate given the review focus on women in USA. Appropriate methods were used to minimise reviewer error and bias during the review process. Study validity was assessed, but only broad classifications of quality were reported in the paper which made it difficult to judge the likely reliability of review findings. Data from diverse studies were pooled and various subgroup and sensitivity analyses were used to examine sources of heterogeneity. Some limitations of the review were discussed by the review authors. The review was generally well-conducted, but the conclusions were based on subgroup analyses of diverse studies of uncertain quality and should be interpreted with caution.

**Implications of the review for practice and research**

**Practice:** The authors stated that access-enhancing and theory-based tailored strategies were important elements in interventions for improved mammography screening rates in ethnic minority women.

**Research:** The authors stated that well-controlled studies were required to increase the effectiveness of interventions.
aimed at increasing mammography screening rates among ethnic minority women (particularly Hispanic women). Researchers may have to consider alternative study designs. Meta-analysis should be carried out when more studies are available.

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