Preventive health care 2001 update: should women be routinely taught breast self-examination to screen for breast cancer?

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Authors' objectives
The authors' stated aim was to assess the effectiveness of self-examination for breast cancer screening in women. In practice, the review focused on the effectiveness of self-examination training programmes for preventing death from breast cancer.

Searching
MEDLINE, PREMEDLINE, CINAHL, HealthSTAR, Current Contents and the Cochrane Library were searched from 1966 to October 2000 for English language publications describing studies in humans. The keywords used were 'breast self-examination,' 'breast diseases,' 'palpation,' 'clinical trials' and 'mass screening.' Additional references were identified by examining the bibliographies of key papers and by consulting experts in the field.

Study selection

Study designs of evaluations included in the review
All study designs were eligible for inclusion. The included studies were randomised controlled trials (RCTs), quasi-randomised controlled trials, cohort studies and case-control studies. The mean follow-up ranged from 5 to 14.4 years for the controlled studies and from 2 to 14 years for the observational designs. The authors did not provide full details about the length of the interventions (training sessions).

Specific interventions included in the review
Training programmes for breast self-examination (systematically inspecting and palpating the breast and axilla). Three controlled trials compared women assigned to breast self-examination educational programmes with women who received no training, in populations with little concomitant screening. Five observational studies examined cohorts of women participating in training programmes or self-reported breast self-examination. Full details were not provided about the types of training used in each study. Most programmes included personalised instruction, practice with silicon breast models and reminders.

The full inclusion and exclusion criteria were not specified. It would appear that all studies on breast self-examination, which were reported in English, were eligible for inclusion.

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
A total of 625,614 women participated in the three controlled trials in China, Russia and the United Kingdom; 482,679 women participated in the five observational studies in the United States, Canada and Finland. The characteristics of the participants differed in each study. Some included a wide age range (31 to 64 years) whereas others included a more defined group (40 to 49 years). The controlled trials and cohort studies included women without breast cancer at baseline. The case-control studies included women with advanced breast cancer (or those who died of breast cancer with distant metastases) and age-matched controls.

Outcomes assessed in the review
The primary outcome was death from breast cancer. Secondary outcomes included stage of cancer when detected, the proportion of benign biopsies, visits to doctors for breast complaints, and psychological benefits and harms.

Studies were eligible if they included data on the association between breast cancer mortality and breast self-examination. Studies that did not contain data on the secondary outcomes were not excluded.
Breast cancer mortality was assessed from tumour and death registry data or hospital records. Follow-up surveys and hospital data were used to assess secondary outcomes.

**How were decisions on the relevance of primary studies made?**

The authors read the abstracts of all retrieved papers and reviewed those that were relevant. However, they do not state the method used to assess the relevance of the studies, or how many of the reviewers performed the selection.

**Assessment of study quality**

The studies were assessed using the methodology of the Canadian Task Force on Preventive Health Care (see Other Publications of Related Interest no.1). This rated the quality of the evidence using a methodological hierarchy based on randomisation, study design and the number of research sites. One author rated the quality of evidence using a methodological hierarchy.

**Data extraction**

The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The data extracted were: the number and type of participants; outcomes measured; the type of intervention; exposure; the length of follow up; breast cancer mortality; rate of benign biopsy results; frequency of breast self-examination; study strength; and potential biases.

**Methods of synthesis**

**How were the studies combined?**

The authors described the major outcomes of each study, tabulated descriptive data, and provided a narrative synthesis which included the main numerical findings. A table summarising the overall recommendations and level of evidence was also provided. Publication bias was not assessed.

**How were differences between studies investigated?**

The authors do not state how differences between the studies were assessed. The differences were described in the narrative.

**Results of the review**

Eight studies with 1,108,293 women were included. There were 2 RCTs (total n=389,511), one quasi-randomised controlled trial (n=236,103), 2 cohort studies (total n=479,174) and 3 case-control studies (total n=3,772).

Seven of the eight studies evaluated the effectiveness of breast self-examination for preventing death from breast cancer. There was evidence that formal breast self-examination training may not reduce death from breast cancer and may increase unnecessary visits to physicians. Two large randomised trials in China and Russia found no difference in breast cancer mortality, or tumour stage at diagnosis, between women taught breast self-examination and controls. A large quasi-randomised trial in the United Kingdom supported these findings after long-term follow-up. Both randomised trials found an increase in physician visits for benign breast lesions among women receiving self-examination training. One randomised trial and one quasi-randomised trial found an increased rate of benign biopsies among women receiving self-examination training.

Evidence about the effects of breast self-examination itself (rather than formal training) is less clear. One large US cohort study found no association between breast self-examination and breast cancer mortality, although this was based on self-report data. Three case-control studies found no difference between the reported frequency of breast self-examination among women with and without breast cancer. These studies were based on retrospective analysis and self-report data. Two of the case-control studies found an increased risk of death or disease among women who were less proficient in breast self-examination, i.e. those who did not perform the technique correctly.
Cost information
The authors did not extract cost data from studies included in the review (presumably, because this data were unavailable). They cited a US study which estimated the cost of providing self-examination training to be US$574 to US$848 for each woman who becomes a competent frequent self-examiner.

Authors' conclusions
There was little evidence for the effectiveness of formal breast self-examination training among women of any age group. The authors suggested that doctors should not routinely teach breast self-examination during health assessments. Potential benefits and harms should be discussed with women who request breast self-examination training, and physicians should ensure that women who request training achieve suitable proficiency.

CRD commentary
The stated aim of this review was to evaluate the effectiveness of self-examination as a mechanism for breast cancer screening. In practice, the review focused on the effectiveness of self-examination training programmes for preventing death from breast cancer.

The authors used standard techniques for searching published literature and established validity assessment criteria. Several databases were searched, although the search was limited to English language publications and some important papers may have been omitted. All studies assessing the effect of self-examination on breast cancer mortality appear to have been eligible. Overall, the narrative synthesis of the data was appropriate, although a meta-analysis of individual patient data from the RCTs may have been valuable.

There were several potential difficulties with the interpretation of the findings.

1. This review did not distinguish between the effectiveness of training programmes and the effectiveness of breast self-examination itself. In order to study the effect of self-examination, rather than training, results from those who complete self-examination proficiently and regularly would need to be compared with those who do not, regardless of the type of training received.

Following training, women may not perform breast examinations regularly or proficiently. The lack of effectiveness found may be based on implementation problems, rather than a lack of benefit from the technique itself. Problems with the way the technique is taught or the women's motivation to self-examine may impact on effectiveness. Indeed, two case-control studies included in this review found a link between proficiency in self-examination and rates of breast cancer.

2. The strongest evidence about breast self-examination training came from two large RCTs in China and Russia, which have not yet been completed. Women in China and Russia may have different diets and other cultural and environmental stresses to women in the western world. There may also be a different level of acceptance for breast self-examination techniques (and women touching their own bodies) in different cultures. These large studies are not necessarily representative of western women.

3. Breast cancer mortality, rather than disease identification, was the primary outcome in this review. It may be more worthwhile to assess the effectiveness of screening programmes using the identification of disease or tumours as outcomes, in addition to mortality rates.

4. Most of the included studies focused on clinical outcomes, rather than social and emotional variables. The effect of self-examination on anxiety and feelings of control could be examined in further research. Women may feel anxiety and a lack of control if they are not able to participate in their health care. This may be particularly true for women concerned about breast cancer or with a family history of the disease. Self-examination may offer women who are worried about breast cancer a 'proactive' option.

5. The authors stated that self-examination may be harmful, based on the costs of extra physician visits and removal of benign lumps. There is a need for a proper cost-effectiveness analysis which weighs up the cost of additional visits to doctors with the number of cases of breast cancer identified.
6. The authors concluded that there was no evidence to support teaching women self-examination during routine health appraisals, but it is unclear whether any of the studies in the review examined training during routine appointments. The large randomised trials assessed specially designed educational programmes, rather than training during routine health visits.

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

Practice: The authors suggest that there is no evidence that women of any age should be taught breast self-examination techniques routinely during periodic health examinations. Doctors should discuss the potential benefits and harms of breast self-examination with women who request training, and ensure that these women achieve suitable proficiency.

Research: The authors did not state any implications for further research.

Reviewer’s statement: The review does not examine the effectiveness of breast self-examination for different subgroups of women. Before suggesting that self-examination training or self-examination itself is ineffective, it is important to assess outcomes for women from different cultural contexts, ethnic groups and women at different levels of disease risk. Self-examination may be more valuable for women with a family history of breast cancer, for example. It is also relatively inexpensive.

Based on the findings, there is a need for more evidence in the following areas: the effect of breast-self examination training for women over the age of 70 years; the effect of proficiently performed breast self-examination rather than formal self-examination training; the benefits and harms of self-examination and training for different subgroups of women (such as those with high familial risk of disease and women in different countries); analysis of outcomes other than mortality; and a cost-effectiveness analysis based on disease identification.

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