The effects of internet or interactive computer-based patient education in the field of breast cancer: a systematic literature review

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CRD summary
This review suggested that there was a positive relationship between internet or computer-based patient education interventions and the knowledge of patients with breast cancer, but the relationship between the interventions and other outcomes was unclear. These findings should be interpreted with caution, as there was variation between studies, methodological limitations in the studies, and a risk of missing data.

Authors’ objectives
The aim was to analyse the type of internet or interactive computer-based patient-education interventions that had been developed and the effectiveness of these interventions for breast cancer patients.

Searching
MEDLINE, CINAHL, PsycINFO, ERIC, Science Direct, Social Sciences Citation Index, Education Research Complete, and the Cochrane Library were searched for studies published in English up to November 2008. The search terms were reported.

Study selection
Randomised controlled trials (RCTs), clinical trials, and quasi-experimental studies that assessed the effectiveness of internet or interactive computer-based patient-education interventions for patients with breast cancer were eligible for inclusion in the review. Studies that examined only the efficiency of support groups or focused solely on breast cancer screening were excluded.

The reported interventions were interactive computer programs (Options for Treating Breast Cancer, The information and decision profiles, Breast Cancer Genetics Computer Program, The Computerized Decision Aid, Interactive Digital Education Aid, and Retratos de la Vida Real) or internet-based training (Comprehensive Health Enhancement Support System, CHESS, and Self-guided Internet-based Coping-skills Training). Control groups received written material, discussions with counsellors, or no intervention. The mean age of participants was 52 years (range 23 to 77). In 64% of studies, only breast cancer patients were assessed, and 29% of studies included patients who had a history of breast cancer or some predisposing risk factor. All of the studies were carried out in the USA or Canada. The most common outcome measures were knowledge and satisfaction; other outcomes included decision-making, quality of life, social support, coping, stress, loneliness, depression, and anxiety.

Studies were assessed for eligibility by three researchers and discrepancies resolved by consensus.

Assessment of study quality
The validity of the included studies was assessed using criteria for power calculation, recruitment, hypothesis, randomisation, blinded assessment, and drop-outs. The authors did not state how many reviewers assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, nor how many reviewers extracted the data.

Methods of synthesis
Studies were grouped by intervention and outcome, and the data were summarised in a narrative synthesis.

Results of the review
The review included nine RCTs, two controlled trials, and three quasi-experimental studies (14 studies involving 2,374 participants in total). Sample sizes ranged from 30 to 749. Participant enrolment, allocation, follow-up and attrition, and power calculations were reported in five studies, while two reported adequate randomisation methods. The research
questions were reported in four studies and hypotheses were tested in seven. In one study different interventions were used for subgroups of younger and older patients. Blinding was not clearly reported in any of the studies and drop-out rates varied mainly between 6% and 25%; one study reported a dropout rate of 51%.

**Knowledge:** Patient knowledge about breast cancer was increased in internet or interactive computer-based patient education groups in six studies. One study reported that the intervention was associated with a greater increase in patient knowledge than written educational materials. Knowledge about treatment options was associated with a more positive outlook in one study. Increased knowledge was not associated with an increase in clinical effectiveness of the doctor–patient relationship (one study) and it was associated with patients taking a more passive role (four studies). Positive effects on health care participation and perceived information competence were reported with the interventions in two studies. Four studies reported that interventions influenced breast health behaviour and participation in health care. Information competence was stronger for patients who spent more time using interactive services than those who spent less time (one study), and they were associated with an increased negative attitude towards the doctor (one study).

**Satisfaction and other outcomes:** Two studies reported that patients were satisfied with their education intervention and one reported that the intervention was useful for patient decision-making. Significant differences in social support were associated with internet-based education for breast cancer in three studies and one study reported that the intervention was associated with a reduction in loneliness. Two studies reported that the interventions did not alleviate patients’ anxiety and one study reported that anxiety levels remained stable after accessing the interactive education, but were higher after face-to-face counselling.

**Authors’ conclusions**
The evidence suggested that there was a positive relationship between internet or computer-based patient-education interventions and the knowledge of patients with breast cancer, but the relationship between interventions and other outcomes was unclear.

**CRD commentary**
This review answered a clearly defined review question, using a broad range of study designs. The literature searches were limited to studies published in English, so the review findings might be at risk of publication and language bias. The risk of reviewer error and bias is unclear; multiple reviewers were involved in assessing the studies for inclusion, but similar precautions were not reported for data extraction and the quality assessment of the studies. The quality of the studies was assessed using relevant criteria and it appears to have been variable. The inclusion of uncontrolled studies and those with less reliable methods, suggests that some of the included studies were at risk of bias. There was variation between the studies, particularly in the types of interventions, their designs, the populations, and the outcomes, and a narrative synthesis appears to have been appropriate. The authors acknowledged a number of limitations to their review, including the variation between studies in the time since cancer diagnosis of the patients.

The findings of the review should be interpreted with caution, given the variation between studies, the methodological limitations of the studies, and the risk of missing data.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that there was a need to develop more internet-based patient education interventions and to study these interventions. These studies should explore other types of outcome, investigate which patients respond better to interventions, and assess whether their knowledge requirements change as their knowledge increases.

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