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Specialist breast care nurses for supportive care of women with breast cancer (Review)

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[Intervention Review]

Specialist breast care nurses for supportive care of women with breast cancer

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ABSTRACT

Background

Breast Care Nurses (BCNs) are now established internationally, predominantly in well resourced healthcare systems. The role of BCNs has expanded to reflect the diversity of the population in which they work, and the improvements in survival of women with breast cancer. Interventions by BCNs aim to support women and help them cope with the impact of the disease on their quality of life.

Objectives

To assess the effectiveness of individual interventions carried out by BCN's on quality of life outcomes for women with breast cancer.

Search methods

We searched the Cochrane Breast Cancer Group Specialised Register and the Cochrane Central Register of Controlled Trials (15 January 2007). We also searched MEDLINE (1966 to September 2006), CINAHL (1982 to September 2006), EMBASE (1980 to September 2006), British Nursing Index (1984 to September 2006), CancerLit (1961 to September 2006), PsycInfo (1967 to September 2006), Library and Info Science Abstracts (LISA) (1969 to September 2006), Dissertation Abstracts International (only available 2005 to September 2006). We contacted authors as appropriate.

Selection criteria

Randomised controlled trials assessing the effects of interventions carried out by BCN's on quality of life outcomes, for women with breast cancer.

Data collection and analysis

Two authors independently assessed relevant studies for inclusion and undertook data extraction and quality assessment of included studies.

Main results

We included five studies, categorised into three groups. Three studies assessing psychosocial nursing interventions around diagnosis and early treatment found that the BCN could affect some components of quality of life, such as anxiety and early recognition of depressive symptoms. However, their impact on social and functional aspects of the disease trajectory was inconclusive. Supportive

care interventions during radiotherapy was assessed by one study which showed that specific BCN interventions can alleviate perceived distress during radiotherapy treatment, but did not improve coping skills, mood or overall quality of life. One study assessed nurse-led follow-up interventions in which no statistically significant difference was identified for main demographic variables, satisfaction with care, access to medical care or anxiety and depression.

Authors' conclusions

There is limited evidence at this time to support the contention that interventions by BCNs assist in the short-term with the recognition and management of psychological distress for women with breast cancer. Further research is required before the impact of BCNs on aspects of quality of life for women with breast cancer can be known.

PLAIN LANGUAGE SUMMARY

Specialist breast care nurses for supportive care of women with breast cancer

Breast cancer is a complex disease which has seen survival for women improve over the last 20 years. Many of these improvements are linked to treatment advances, improved screening and a multiprofessional approach to its management. Breast Care Nurses (BCNs) work within this multiprofessional environment providing a range of interventions including support, information, patient advocacy and general liaison among the various members of the healthcare team. The objective of this review was to assess the effectiveness of individual interventions carried out by BCNs on quality of life outcomes for women with a diagnosis of breast cancer. We reviewed five studies which met the criteria for this systematic review. These involved a range of interventions and outcome measurements, and included women of various ages and in various stages of breast cancer assessment and treatment. These studies also used many different methods of reporting statistical findings and for this reason, the results of the studies could not be combined. Despite limited evidence to support their BCN role, one study which looked at follow up by the BCN compared to a doctor concluded that there were no differences for either group in terms of satisfaction with care or the ability of the healthcare provider to identify anxiety and depression. Another study showed that specific BCN interventions can alleviate perceived distress for women undergoing radiotherapy treatment however this did not have any impact on coping skills, mood or overall quality of life.

Generally speaking, this review found limited evidence to identify the components of the BCNs role which impact on a woman's quality of life but acknowledge that the nature of their work, provided within a multiprofessional team, serves to complement the team as a whole rather than highlighting the impact of the BCN alone. Further research is, however, needed which addresses the impact that BCNs may have on aspects of quality of life for women with breast cancer.

BACKGROUND

Breast cancer is a significant health problem worldwide, and a complex disease both physically and psychologically (WHO 2005). Dealing with the many challenges relating to a diagnosis of breast cancer, such as lengthy treatments and trying to combine recovery with family and work commitments, can have a significant and negative impact on women (Fallowfield 2002; Schultz 2005; Spagnola 2003). Following diagnosis of breast cancer an individual's quality of life can be challenged physically, psychologically and functionally. Depression and anxiety may result from the distress of diagnosis, fear of a life-threatening disease and tumour recurrence. Breast surgery may impact psychologically on a woman's body image and sexuality. Side effects such as nausea and vomiting: hair loss and fatigue; secondary lymphoedema; symptoms associated with therapy-induced menopause, such as hot flushes and emotional lability are just some of the physical consequences of breast cancer treatments. To the individual patient, therefore, breast cancer is not only a medical problem, but also one which has serious psychological, emotional and social impact. Effective management requires a professional and holistic approach.

Maguire 1978 and Maguire 1983 were the first to identify the specific emotional and psychological needs of women diagnosed with breast cancer and the need to offer both psychological as well as physical care to aid recovery. Their work laid the foundation for the development of the role of Breast Care Nurses (BCNs) in the United Kingdom. Other countries have also embraced this role. In North America, Australia and Scandinavia, BCNs or Specialist

Breast Care Nurses (SBCNs) have been developing their roles over the past 20 years. Various educational models and postgraduate programmes have evolved to prepare BCNs for their role (Eicher 2006; EUSOMA 2007; RCN 2007).

The roles and titles of BCNs can vary across continents, and some work has been done to define the role better. Yates 2007 consulted stakeholders and undertook a focussed review of existing literature to develop competency standards for Australian BCNs. They define the BCN as:

"a registered nurse who applies advanced knowledge of the health needs, preferences and circumstances of women with breast cancer to optimise the individual's health and well-being at various stages across the continuum of care, including diagnosis, treatment, rehabilitation and palliative care"

Illuminating and quantifying what the BCNs do is difficult due to the variations in practice settings in which they are employed and training opportunities available. Yates 2007 identified five main domains of competency for BCNs. These are supportive care, collaborative care, co-ordinated care, information provision and education and clinical leadership.

Interventions which provide supportive care are not exclusive to nursing, hence the difficulties in establishing the impact of nurse-led interventions on patient outcomes (Corner 2003). Despite this, there is research evidence that the BCN contributes to improvements in outcomes for women by providing information and support which promote continuity of care (Redman 2003; Yates 2007). Women themselves have reported positive outcomes from their interactions with the BCN. In the study by Gray 2002, women found supportive care by the BCN to be paramount in improving their illness experience and quality of life. Likewise, in interviews with women with breast cancer conducted by Halkett 2006, interviewees repeatedly emphasised the importance of the role of the BCN in providing support through communication, establishing rapport and an awareness of their needs. The availability of the BCN and the provision of reassurance and practical information was seen to be particularly useful. The Specialist Breast Nurse Project Team (NBCCSBNPT 2003) interviewed 176 women and found that they viewed BCNs as good communicators who were skilled in explaining issues and who provided a significant link between them and their doctors (96%) and community health workers (86%). Continuity of care was rated as a major benefit by 88% of these women and 97% reported that they benefited from ongoing contact with the BCN.

Supportive care can be variously defined and is frequently interpreted as a vague umbrella term including anything from an evidence-based intervention to a bedside conversation. In terms of the BCN role, supportive care interventions are aimed at improving women's quality of life. This supportive role reflects the ability of the BCN to identify multiple physical, psychological, social, sexual, cultural and spiritual needs of individual breast cancer patients. Needs identification at all stages of the illness, implementation of evidence-based interventions and psychosocial support in a responsive and flexible manner, provided in conjunction with anti-cancer treatment, are key (NBCCSBNPT 2003; RCN 1999; RCN 2002a; Yates 2007).

Currently, BCNs are mainly supported within better resourced healthcare systems where they are often the primary contact for women following a diagnosis of breast cancer. Working as part of a breast team is central to the work of BCNs and, as such, they are a regular feature of the multidisciplinary healthcare team (Amir 2004; SIGN 2005). National and clinical guidelines recommend multidisciplinary teams (MDTs) as the best way to manage breast cancer and maximise outcomes (Grunfeld 2005; NICE 2002). The effectiveness of these teams comes from common goals and understanding among members as to the impact of the illness on each woman, recognising her circumstances, feelings, concerns and preferences for treatment and the contribution each can make (Mileshkin 2006). The BCN is a well respected and well established entity within these teams, and has been shown to impact positively on the overall quality of clinical care provided to women (P=0.003) and to exert a positive influence on the work of their teams and their medical colleagues (Haward 2003)

The aim of this systematic review was to examine a range of quality of life outcome indicators (physical, psychological and psychosocial) in order to establish changes in outcomes for women which can be attributed to BCN supportive care interventions thereby informing the future development of the BCN role.

OBJECTIVES

To assess the effectiveness of individual interventions carried out by BCNs on quality of life outcomes for women with a diagnosis of breast cancer.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs)

Types of participants

Women with a diagnosis of breast cancer. Eligible participants included women of any age, stage of disease, receiving any treatment modality and in any setting including inpatients, outpatients and primary care

Types of interventions

Breast Care Nurses (BCNs). A BCN is defined for the purposes of this review as a registered nurse with a qualification or specialist knowledge in Breast Care (NHS 2005). Examples of comparisons are as follows:

1. BCN versus no BCN
2. BCN versus other supportive care interventions
3. BCN versus other care

Types of outcome measures

Women reported levels of physical, psychological, and psychosocial indices of quality of life measured using reliable and valid assessment tools. Quality of life is a broad term which is used widely in research to encompass a variety of factors that impact on women's wellbeing. Included studies used a number of different validated tools

Quality of life indicators assessed in this review include any of the following:

- menopausal symptoms;
- physical and functional well-being;
- fatigue;
- lymphoedema;
- nausea;
- vomiting;
- anxiety and depression;
- coping;
- body image;
- sexual functioning;
- social and financial.

Secondary outcome measures include:

- economic data;
- service provision.

Search methods for identification of studies

Electronic searching

The group searched the Cochrane Breast Cancer Group Specialised Register and the Cochrane Central Register of Controlled Trials on 15 January 2007.

We applied the MEDLINE search strategy Appendix 1 (Silver Platter; Edition 2003) - based on the Dickersin strategy (Dickersin1994) for RCTS, the Cochrane Breast Cancer Group's strategy for the identification of populations with 'breast neoplasms' (1966-2006) and the following key terms to identify supportive care interventions by Specialist Breast Care Nurses:

1. exp breast neoplasms/nu;
2. exp nurse clinicians;
3. exp nurse's role;
4. exp oncologic nursing;
5. exp nurse practitioner;
6. or/1-5;
7. (breast adj3nurs$).ti,ab,sh;
8. or/6-7;
9. support$ adj/5 (care or caring).

We searched the following databases to obtain relevant studies for this review and adapted different search strategies according to the query requirements of individual databases. We did not restrict our search by year or language of papers.

CINAHL (1982 to September 2006) (Appendix 2)

EMBASE (1980 to September 2006) (Appendix 3)

PsycInfo (1967 to September 2006) (Appendix 4)

BRITISH NURSING INDEX (1984 to September 2006) (Appendix 5)

CancerLIT (1961 to September 2006) - Indexed by MEDLINE

Library and Info Science Abstracts (LISA) 1969 to September 2006 (Appendix 6)

Physician Data Query (PDQ) available through the National Cancer Institute web site at:http://www.cancer.gov/search/clinical_trials/ - Indexed by MEDLINE to September 2006

Meeting abstracts available through the U.S. National Library of Medicine Gateway search available at: http://gateway.nlm.nih.gov/gw/cmd to September 2006

We searched the ISI Web of Knowledge database for relevant abstracts from conference proceedings to September 2006.

Hand searching

We did not undertake hand searching, due to limited time and resources. Results of handsearching of Cancer nursing (1995-2000) and Supportive Care in Cancer (1993-2000) are included in the Cochrane Central Register of Controlled Trials.

Experts in the field

We contacted one author of an identified study for further information.

Limitations

SIGLE (The system for information on Grey Literature in Europe) was not available to search and Dissertation Abstracts International (1961- present) was only available from 2005 to September 2006.

Data collection and analysis

1. **Assessment of methodological quality**

Two authors (SC, CK) independently assessed all the titles and abstracts retrieved by the electronic searches to identify potentially relevant studies. We entered references of selected studies into a table and requested a full text copy. Pairs of reviewers (SC & ID, CK & KL) agreed by discussion which studies met the inclusion criteria. Two authors (SC and CK) assessed and graded the methodological quality of included studies using a standardised quality scale by Jadad 1996. The authors used the Cochrane Collaboration criteria to assess allocation concealment (A- adequate, B - unclear, C- inadequate, D- not used). See Table 1 for included studies.

2. **Data extraction**:
Key information was extracted by the authors (SC & CK, ID & KL) on a standardised data extraction form to include the following.
a. General Information
Author, title, source, contact address, year of study, country of study, language of
publication, year of publication.
b. Trial characteristics
Design (randomised or non-randomised), randomisation method, manner of
recruitment, sampling, duration of intervention period, length of follow-up, reason
and number of dropouts, adverse events.
c. Patients
Stage of disease, inclusion criteria, age.
d. Intervention
Detailed description of the controlled intervention, mode, intensity, duration.
e. Outcomes
Specific outcome reported, assessment instrument used, scoring range.
f. Economic data
Cost.
g. Service provision
Resource allocation.
We produced two tables, one to identify the included studies and the other detailing the characteristics of all excluded studies. See 'Characteristics of included studies' and 'Characteristics of excluded studies'.
3. **Combining data**
The heterogeneity of studies both with regard to the diversity of interventions assessed and outcomes measures used made a quantitative pooling of data inappropriate. The main outcome measures are in the form of continuous data, reporting a comparison between treatment and control group levels of psychological distress and/or quality of life. A variety of validated tools was used to measure the outcomes within studies, and this review therefore presents a narrative synthesis of the different interventions identified and the main results of the included studies.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies; Characteristics of ongoing studies.
We reviewed a total of 1,441 abstracts. Of these, we retrieved 34 full text articles for further examination.
We excluded 16 articles because they were not a nursing intervention (Allen 2002; Ambler 1999; Bordeleau 2003; Brown 2002; Giese-Davis 2002; Goodwin 2003; Helgeson 1999; Maguire 1985; Rolnick 1999; Samarel 2002; Sandgren 2000; Sandgren 2003; Targ 2002; Vos 2004; Williams 2004; Wyatt 2004). We excluded another eight studies because the outcomes did not meet inclusion criteria (Cimprich 1993; Hughes 2000: Kolcaba 1999; Larsson 1992; Lev 2001; Mock 1997; Motzer 1997; Sameral 1998); two more studies provided insufficient data to extract results despite contacting authors (Cleeland 1996; Ironson 2002). See table 'Characteristics of excluded Studies' for more information.
One study (Arving 2006) met the inclusion criteria, but presented insufficient data to extract results. Contact with the study authors established that this paper is not yet published. See 'Characteristics of on-going studies' for more information.
Seven articles were eligible for inclusion in the review. These reported on five primary studies which were subsequently included in the review (Koinberg 2004; Maguire 1980; McArdle 1996; Ritz 2000; Wengstrom 1999). As Maguire 1980 and Maguire 1983 report on the same study, this data has been combined under the primary publication Maguire 1980. In addition, Wengstrom 1999 and Wengstrom 2001 also reported on the same study. We considered data presented in the 1999 paper to be of primary significance for this review See 'Characteristics of included Studies' for more information.
We categorised the included studies into three groups, according to the intervention assessed.
1. Psychosocial nursing interventions around diagnosis and early treatment (three studies, 654 breast cancer patients) (Maguire 1980; McArdle 1996; Ritz 2000).
2. Supportive Care interventions during radiotherapy (one study, 134 breast cancer patients) (Wengstrom 1999).
3. Nurse-led follow-up interventions (one study, 264 breast cancer patients) (Koinberg 2004).

1. Psychosocial nursing interventions around diagnosis and early treatment

Psychological morbidity is recognised as a significant consequence of a diagnosis of breast cancer WHO 2005. BCNs are widely involved in supporting women with breast cancer from the point of diagnosis throughout the disease trajectory. These roles have become fully established and embedded in many practices.
Maguire 1980 conducted a RCT to determine whether counselling by a specialist nurse prevented the psychiatric morbidity associated with mastectomy and breast cancer. This study randomised 172 women with breast cancer, who had a modified radical mastectomy and full axillary clearance, to receive a counselling intervention carried out by the nurse within a few days of surgery and thereafter every two months at home for 12-18 months, or routine care from a surgical unit doctor. They also wanted to determine if a specialist nurse improved the physical and social recovery of women and helped them to adapt to the breast loss following mastectomy for

breast cancer. These early studies sought to identify the problems encountered by women with breast cancer, and the role of the nurse in helping to alleviate them. They report data relating to the role of the specialist nurse in preventing psychiatric morbidity following mastectomy (Maguire 1980) and the role of the specialist nurse in reducing physical disability and improving social recovery after mastectomy (Maguire 1983).

McArdle 1996 conducted a prospective RCT to evaluate the effect of support from a nurse specialising in breast care and a voluntary support organisation on prevalence of psychological morbidity after surgery for breast cancer. This study randomly assigned 272 women prior to surgery to one of four groups:

a) routine support from ward staff and an information booklet (Understanding cancer of the breast: BACUP);

b) as per group A plus support from (BCN);

c) as per group A plus support from a voluntary organisation (Tak Tent);

d) as per group A plus support from BCN and the voluntary organisation.

Prevalence of psychological morbidity was assessed using self rating scales: a 28-item general health questionnaire and its subscales, and the hospital anxiety and depression scale. Measurements were made at the first postoperative clinic visit and at 3, 6, and 12 months after surgery.

Ritz 2000 compared whether standard medical care (SMC) or SMC plus the additional input from an Advanced Practice Nurse (APN) could improve quality of life outcomes while decreasing overall costs. In this study, 210 women were randomly assigned to one of two possible groups.

- SMC
- SMC plus an intervention delivered by an APN within two weeks of diagnosis of breast cancer and up to 12 months. The APN was qualified with a Masters' degree in nursing and had in-depth knowledge and skills in the care of this group. The intervention following diagnosis provided written and verbal information about breast cancer, what to expect in consultations with physicians, decision-making support, answering questions and the presence of the APN at consultation to support the women. Subsequent contact was provided in a variety of settings, including hospital, telephone and community, to reinforce information, provide continuity and offer ongoing support.

2. Supportive Care interventions during radiotherapy

We found one RCT (Wengstrom 1999) which assessed the effect of a nursing intervention for women receiving curative radiotherapy on their subjective distress, side effects and quality of life. The goals of the intervention were to enhance and restore the women's ability for self-care.

This study randomised 134 women with breast cancer to standard nursing care (SNC) or SNC plus a structured nursing intervention.

- SNC: This included a group information session for women containing information about treatment, routines and side effects, and contact with a nurse during the treatment period (approx. 15 minutes was spent with each woman).
- SNC plus a structured nursing care intervention: This involved an additional individual session for each woman focusing on encouraging self care actions to minimise, prevent or alleviate side effects of therapy, psychological support, education and guidance, and referral to the wider multi-professional team.

3. Nursing led follow-up interventions

Rojas 2000 questioned the value of routine follow ups with frequent visits to a breast cancer medical specialist. Specialist nurses working in the field of breast cancer are increasingly involved in this type of intervention. We found one RCT (Koinberg 2004) which compared routine follow up of breast cancer patients by a specialist oncologist/surgeon within a hospital setting to follow up by demand, managed by an experienced nurse specialist, working within a hospital setting.

This study randomly assigned 264 breast cancer patients with stage 1 or 2 disease to one of two possible follow-up practices within a large cancer centre.

- Standard follow-up care: The patient was examined by an oncologist or surgeon four times per year for the first two years, bi-annually for five years and yearly thereafter, plus yearly mammography.
- Intervention: A Nurse Specialist saw the patient three months post-surgery. The Nurse Specialist worked within a large cancer centre and had in-depth knowledge and skills in the care of this patient group. The Nurse Specialist gave the women information about recurrence, advice, and contact details, and they were asked to contact the nurse if there were concerns or symptoms related to the breast cancer. The Nurse also co-ordinated yearly mammography.

Risk of bias in included studies

Using the framework provided by Jadad 1996 for assessing study/design and reporting quality, we graded all the studies accordingly (0 was considered the weakest and 5 the strongest). See Additional Table 1 'Quality assessment' for more information.

- Described as randomised 0/1
- Method of randomisation described and appropriate 0/1
- Described as double blind 0/1
- Method of double blinding described and appropriate 0/1
- Withdrawals and dropouts described 0/1
- One point deducted if method of randomisation described was inappropriate 0/-1
- One point deducted if study described as double blind, but method of blinding inappropriate 0/-1

The Jadad framework and the assigning of a quantitative score were not representative of the overall quality of a paper, particularly as it is not possible to blind these types of interventions. Despite this, none of the studies could be considered high quality.

1. Psychosocial nursing interventions around diagnosis and early treatment

Maguire 1980 graded 2

The authors claim the groups were closely matched on variables including pre-operative psychological morbidity, stage of disease, other treatments, age, marital status, social class and other stressful events, although no specific details were given. Assessments were completed on 152 women; of the 20 remaining, drop out was explained for eight.

McArdle 1996 graded 1

The authors reported levels of attrition (95), but it was unclear if those who dropped out were included in the analysis. This was an important consideration, particularly as their was inequality of loss to follow up between the different groups. At 12 months, the loss was 24% for routine care compared to 6% (nurse only), 8% (voluntary organisation only) and 16% (combined). There may have been differences between these groups and those who remained in the study. Consent was not obtained prior to randomisation, with some women unwilling to receive the support offered, and this may have contributed to the large attrition rate. No one refused to see the nurse, but 12 participants did not want to be approached by the voluntary organisation (VO). Of those who did have contact with the VO, a further 17 did not wish further contact. It is important to acknowledge that the timing of the interventions and, indeed, the function of Tak Tent differed from the norm, whereby women would be expected to self-refer rather then be referred to the organisation.

Ritz 2000 graded 1.

The authors claim the groups were similar but with two exceptions: women in the intervention group were significantly more likely to have a lower histology (p = 0.04) and to receive adjuvant hormone therapy (p = 0.03) then the women in the control group. There is no evidence that this has been addressed in the analysis. Levels of attrition were significant in both arms between baseline and 24 months (Intervention group: baseline 95%, to 76% at 24months; Control group 76% at baseline to 52% at 24 months) and data is presented up to and including12 months only. This was explained as a reflection of decreased patient need between 12 and 24 months. Cost outcome data were complete for 141 (intervention 74, control 64). A further 11 particiapants had some data missing which was adjusted using the mean cost data for simialr participants. The remaining 58 (intervention 28, control 30) for whom cost data were incomplete were excluded from the analysis. Missing cost data were attributed to different referral patterns, changes in the participants' insurance and transfer to a different setting.

2. Supportive Care interventions during radiotherapy

Wengstrom 1999 was graded 2.

The authors reported that the randomisation procedure at baseline failed to select groups with equal quality of life variables. They acknowledge that this may be attributable to either a failure in the randomisation procedure or a chance occurrence. The authors report reasons for declining to participate in the study and the withdrawal of 1 woman in the control group.

3. Nurse-led follow-up interventions

Koinberg 2004 graded 2.

The authors reported the study recruited 400 women over three centres. They claim that in one centre the control and intervention groups were too similar to include in the final analysis. This therefore excluded 135 women from the final results. There are no specific details reported about withdrawals or dropouts other then death.

Some limitations in using the Jadad 1996 quality scoring scale to assess quality of life research are noted. Papers which give details of methods of randomisation and double blinding could score artificially high despite the quality of these assessed components being poor. It is noteworthy that other systematic reviewers have identified the limitations of Jadad in assessing psychosocial and quality of life research (Sola 2004).

Effects of interventions

The five studies in this review assessed the impact of the breast care nurse on various aspects of quality of life, and indicators of psychological, psychiatric and physical morbidity. Maguire 1980, McArdle 1996 and Ritz 2000 measured anxiety and depression, physical and social well-being and coping at different stages. Wengstrom 1999 focused on coping, subjective distress and physical side effects of radiotherapy treatment and Koinberg 2004 considered well-being during follow-up. Many of the studies used multiple instruments administered at numerous time points to assess these outcomes. Some studies relied on patient reporting, while others assessed the rate of referral between the BCN and other health professionals. Many statistical methods to assess results were used by the studies. Reporting of results was generally poor with some studies providing little in the way of quantative results.

Therefore, this review presents a narrative synthesis of the main results according to the different interventions identified. See Additional Table 2 'Study results' for more information.

1. Psychosocial nursing interventions around diagnosis and early treatment

Three studies with a total of 634 women assessed the effects of a nursing intervention on psychological morbidity and quality of life (Maguire 1980; McArdle 1996; Ritz 2000).

Maguire 1980 randomised 172 women post-mastectomy to usual care (not explained) or counselling by a nurse specialist. Seventy five patients were counselled by the nurse and 77 patients received only the care normally provided by the surgical unit. Three months

after mastectomy there was no difference between the counselled group (29, 39%) and control group (33, 43%) in anxiety state, depressive illness, sexual problems or a combination. Twelve to eighteen months after mastectomy, 69 (92%) women in counselled group were anxiety free as compared to 54 (70%) in the control group. Depression was also less in the counselled group, absent in 71 (95%) compared to 54 (70%) in the control group. Consequently , 12-18 months after mastectomy there was much less psychiatric morbidity in the counselled group (12%), compared to 39% in the control group. The nursing intervention led to recognition of psychiatric morbidity and prompted referral of 76% of those who required help, as opposed to 15% in the control group.

The study only rated sexual problems in counselled patients and 48 controls who had reported a satisfactory sex life prior to surgery. Sexual problems were identified in 15 of the control group and in 4 in the counselled group.

Recovery after surgery

Significantly more counselled (54, 72%) than control group (42, 55%) were satisfied with scar versus neutral or dissatisfied (chi-squared+4.97, p>0.05); More of the control group (23, 33%) were dissatisfied with their prosthesis than in the counselled group (11, 15%) (chi-squared = 6.66, p>0.02). More counselled (51, 68%) than control group (40, 52%) had adapted to breast loss (chi-squared = 4.07, p>0.05) although women in both counseled (8, 11%) and control (7, 9%) groups were unable to accept the loss of a breast.

Differences in housework, social adjustment and return to work were all improved in the counselled as opposed to control groups. Nil versus some problems with housework (chi-squared+2.95, p>0.05); for nil versus some problems in social adjustment (chi-squared=5.01, p>0.05) and for return to work versus not (chi-squared=4.59, p>0.05).

Counselled and control groups both had a small but important minority (12%) who suffered from moderately severe or severe swelling in a limb 12 - 18 months after surgery.

McArdle 1996 carried out a prospective RCT with 272 women. The results indicate a reduction in psychological morbidity in the group receiving care from the BCN. The data were summarised using means and standard deviations despite an acknowledgment of skewed data. Summary measure for each woman were taken using the average value over the four assessments (postoperative clinic visit and follow up at three, six and twelve months) and compared measures using the Kruskal-Wallis test, with correction for ties. This was followed with pairwise multiple comparisons among the four treatment groups using Mann-Whitney tests. These are reported as unadjusted P values set at a significance level of 0.05. A Bonferroni adjustment gave a significance level of 0.008 but these adjusted levels are not presented. These results should be viewed with caution as the authors acknowledged that the data was skewed.

Ritz 2000 reported a RCT of 210 women randomised to receive an intervention provided by an Advanced Practice Nurse (APN) versus usual care on aspects of quality of life. This study indicated that the intervention provided by an Advanced Practice Nurse (APN) (American designation which meets criteria for BCN) was beneficial in reducing levels of uncertainty of illness up to six months following diagnosis but this was not the case at 12 months where they were comparable. The beneficial effects of the APN were greater for unmarried women than for married women (p = 0.017). Differences in mood disturbance and well-being were not statistically significant, apart from in the sub-group analysis, which demonstrated a greater beneficial effect in the intervention group for unmarried women.

The results of this study indicate that beneficial effects of intervention by APNs are significant in the immediate six months following diagnosis, but are not sustained beyond this. Women who are unmarried appeared to benefit more from APN interventions than married women. These findings may support the implementation of APN support for some individuals during the initial adjustment stages immediately following a diagnosis of breast cancer.

2. Supportive care interventions during radiotherapy

One study, (Wengstrom 1999) measured the effects of a nursing intervention on subjective distress, side effects, coping and quality of life of breast cancer patients receiving curative radiotherapy. In this study,134 women from a total of 175 consecutive patients agreed to be randomised to the intervention group (standard nursing care plus intensive nurse led intervention at weeks 1, 3, and 5 and three months) or control group (standard nursing care). No significant differences were found between the two groups comparing baseline data, however a significant difference in QOL (p<0.05) indicated that women in the experimental group had a poorer QOL than in the control group.

The intervention had a significant effect on perceived distress. The women in the intervention group rated fewer distress reactions than those in the control group (p<0.05). The intervention had no measurable effect on global QOL or in perceived side effects.

Results from this study suggest that specific BCN interventions can alleviate perceived distress during radiotherapy treatment but may not improve coping skills, mood or overall quality of life. In this study, the wide age range and different life stages of the women may have impacted on perceived effects of the intervention.

3. Nurse-led follow-up interventions

One RCT (Koinberg 2004), compared routine follow up by a specialist oncology surgeon (including clinical examination) to follow up by demand (without clinical examination) managed by an experienced nurse specialist on quality of life. In this study, 264 women were recruited from two hospitals. There were no statistically significant differences between the groups for the main demographic variables, satisfaction with care, access to medical care and anxiety and depression. For anxiety and depression reported problems varied between 4.4% and 11.6% for anxiety and 0.8% and 5.2% for depression. Satisfaction in both group was ranked highly over the follow-up period (93%-100%), suggesting that the

women found each model acceptable.

Access to medical care

There were 21% more primary contacts in the specialist group. In the nursing group there was a higher rate of mammaographies but a similar rate of other imaging and laboratory tests.

The women's experiences of accessibility and phone service use, showed there were no statistically significant differences between the groups.

4. Cost data

This review was also interested in cost data however only one of the five included studies provided any information relating to cost (Ritz 2000). In this study cost data were collected from hospital and the clinic billing system for two years following the date of diagnosis for each woman. The study was unable to collect some costs such as anesthesiologists, emergency room physicians and radiation oncologists but collected data on the length of hospitalisation and number of visits to a healthcare provider. Full cost data were available for 141 women. Missing cost data for 11 women were imputed using the mean cost data for similar women. The remaining 58 women for whom cost data were incomplete (28 in intervention group; 30 in control) were excluded from the analysis. The results indicated that the interventions by the APN did not decrease cost of care but also identified fixed costs associated with clinic appointments, treatments and hospital admissions that the APN could not influence.

DISCUSSION

This review of the effectiveness of individual interventions carried out by BCNs on quality of life outcomes for women with a diagnosis of breast cancer identified five RCTs for inclusion. No quantitative analysis could be done due to heterogeneity among interventions employed and the large numbers of, and diversity of outcome measurements used, the variation in stages of breast cancer among the participants and the variations in the methods of reporting statistical findings within studies. All studies included participants with a wide age range and stage of disease. The inclusion criteria, particularly in Koinberg 2004, Maguire 1980 and Wengstrom 1999, did not differentiate between the different needs of age groups and life stages. This added to the difficulties in combining data. Only one study (Ritz 2000) considered costs and it was not possible to attribute cost reduction to nursing interventions.

There is therefore limited evidence from RCTs to support some of the BCN interventions at this time. The findings of this review do however, lead us to the following discussion.

In categorising the studies according to the disease trajectory, it became clear that there were limited assessments of BCN interventions beyond the diagnosis and treatment phase. The work by Maguire 1980 initially set the precedent for the introduction of BCNs in the United Kingdom. Since this time, there have been few international trials building on this early work, although many countries now utilise BCNs. This review identified four RCTs in addition to Maguire's work which met the criteria. All of these recognised the difficulties nurses experience in conducting RCTs within practice. We also identified (but excluded) a number of studies which assessed supportive interventions provided by a psychologist. This indicates some blurring and overlapping of the roles for these two disciplines.

We recognised that restricting the review to RCTs limits the possibility of assessing the evidence relating to the effectiveness of BCN interventions. The nature of the work, provided within a multidisciplinary team, serves to complement the work of the team as a whole rather than highlighting the impact of the BCN alone. This was clear in the study by Koinberg 2004, where the women were equally satisfied with the care by the doctor and the nurse. BCNs remain an integrated and respected part of the multidisciplinary team.

AUTHORS' CONCLUSIONS

Implications for practice

- The studies of interventions carried out by BCNs indicate that they may provide some benefit to women with breast cancer, particularly in the identification of anxiety and depression. BCNs should ensure all aspects of quality of life are regularly assessed as part of routine care.

- The findings suggest that the interventions had a short-term, rather than a long-term benefit for women. BCNs may need to provide focused interventions that reflect different stages of a woman's disease and treatment pathway, to provide maximum supportive care.

- Supportive care interventions are not exclusively delivered by BCNs. The provision of education and training should reflect their work within multi-professional teams.

Implications for research

- A wide range of research is still required in this field, encompassing both BCN specific outcomes and their contribution to multi-professional working.

- In the future, RCTs with clearly identified outcomes and a multi-centred approach are needed to ensure women receive the optimum care from BCN interventions. This should include cost analysis.

- We did not find the studies in this area to be of a high overall quality and it is essential that in the future this is addressed to ensure questions are answered in a rigorous and valid manner.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Koinberg 2004

Methods	RCT Multicentre, Sweden Data from 2 hospitals only included
Participants	This trial included 264 patients with breast cancer 1. Specialist Nurse Group n =133. 2. Physician Group - routine follow up (control) n=131 Sex: 264 (100% female). Mean Age: PG: 58.8; NG:60.0 (range <40-79). Clinical Stage: 1 or 2. Inclusion criteria: Newly diagnosed with breast cancer as either p-TNM Stage 1 or stage 11 in accordance with the UICC classification. Not participating in a clinical study which required a specific follow-up programme. Able to give informed consent.
Interventions	Specialist nurse intervention with check-ups on demand. A nurse with specialist experience in breast cancer met patients approximately 3 months following surgery. Women received information about recognising recurrence, aspects of self-care and time to talk about psychosocial aspects. Women advised to contact the nurse if symptoms arose which were perceived as due to breast cancer. Mammography carried out yearly arranged by the nurse. Blood tests, chest x-ray or other imaging performed on clinical indication CONTROL: Routine follow-up visits to a physician. Clinical examination/hospital visit 4 times per year following first 2 years, bi-annual for 5 years, yearly after 5 years. Mammography carried out yearly. Blood tests, chest x-ray or other imaging performed on clinical indication
Outcomes	Aspects of quality of life measured by: 1)Hospital Anxiety and Depression (HAD) Scale 2)Medical record review 3)Satisfaction and accessibility (SaaC) scale The HAD and the SaaC were sent to the patient's home 6 months post randomisation. The first data were collected 6 months after randomisation and 6 monthly thereafter over a 3-year period. A 7th assessment was done at 5 years. Medical records were reviewed in the 5th year. This included number and type of medical consultation and diagnostic procedures
Notes	

Risk of bias

Item	Authors' judgement	Description

Koinberg 2004 (*Continued*)

Allocation concealment?	Yes	A - Adequate

Maguire 1980

Methods	Controlled Trial Study site not specified - presumed to be an acute hospital setting
Participants	This trial included 172 patients post mastectomy 20 recruits withdrew. 1. Specialist Nurse Group n= 75. 2. Routine care by surgical unit (Control) n= 77 Sex: 152 (100%) Female Mean Age: not specified. Clinical condition: Breast cancer patients who had a modified radical mastectomy and full axillary clearance. Inclusion criteria: Not specified and no details of how informed consent was obtained
Interventions	INTERVENTION: Nurse-led counselling service. Woman seen by nurse within a few days of surgery and thereafter every 2 months at home. Follow up for 12-18 months after mastectomy. CONTROL: Routine care from surgical unit.
Outcomes	Psychiatic morbidity measured by: 1.Anxiety, depression and sexual problems (Present state examination). 2.Assessment of other stressful life events 3.Mood (Linear analogue scales 12-18 months post mastectomy). 4.Semi-structured interview shortly after surgery, 3, and 12-18 months following surgery to assess physical and social recovery in three areas: swelling, pain and disability. reaction to scar, breast loss and prosthesis. house work, social adjustment, return to work.
Notes	This data is taken from both Maguire 1980 and 1983. Maguire 1983 is referenced in additional references

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	D - Not used

McArdle 1996

Methods	Prospective RCT:
Participants	This trial included 272 patients with breast cancer randomised prior to surgery; 1. Routine care n=67 (median age 59); 2. Routine care plus Breast Care Nurse n=70 (BCN) (median age 55); 3. Routine care plus support from voluntary organisation (Tak Tent (TT) n=66 (median age 56); 4. Routine care plus support from the voluntary organisation and the BCN n=69 (median age 57) 122 had mastectomy. 144 had lumpectomy. Adjuvant treatment. 124 - no adjuvant treatment or tamoxifen alone. 103 radiotherapy. 41- chemotherapy. Mean Age: SMC: 55.3; APN: 55.7 (range < 30-85yrs). Clinical condition: Breast cancer. Inclusion criteria: Patients under 70 years. Undergoing breast cancer surgery. Ability to attend follow up clinic. Exclusion criteria: Non-English speaking. Deafness. Low intellect - no criteria for assessment given. Psychiatric illness/cognitive impairment.
Interventions	Four groups: a) Routine support from ward staff and information booklet (Understanding cancer of the breast: BACUP) b) Routine care as per group A plus support from breast care nurse (BCN) c) Routine care as per group A plus support from a voluntary organisation (Tak Tent) d) Routine care as per group A plus support from BCN and the voluntary organisation
Outcomes	Psychological morbidity measured using: 1.28-tem general health questionnaire. 2. Hospital Anxiety and Depression (HAD) Scale. Data collection using validated assessment tools at baseline, 3, 6,12 months after surgery
Notes	The authors report the median age of women, not the mean

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Ritz 2000

Methods	RCT:
Participants	This trial included 210 patients with breast cancer 1. Advanced Practice Nurse (APN) Group n=106 2. Standard medical care (SMC) Group n=104 Sex: 210 (100%) Female. Mean Age: SMC: 55.3; APN: 55.7 (range <30-85yrs). Clinical condition: Intervention group more likely to have lower histology (p = 0.04) and receive adjuvant hormone therapy (p = 0.03) than women in the control group Inclusion criteria: Women aged 21 years or older. Able to read and write in English. Able to give informed consent. Consent gained within two weeks of diagnosis. Physician referral from within the care system. Exclusion criteria: History of cancer. Co-morbidities that limited functional ability. Severe psychiatric illness.
Interventions	INTERVENTION: SMC plus APN care provided during clinic, hospital, telephone and homecare visits. Interventions included assessment, diagnosis, outcome identification, planning, coordination, symptom management, health education, consultation, research based on ONS standards of advanced practice CONTROL: SMC described as routine medical care but this is not defined
Outcomes	Aspects of quality of life measured by: 1. Mishel Uncertainty in Illness Scale (MUIS). 2. Profile of Mood States (POMS). 3. Functional Assessment of Cancer Therapy (FACT-B). Data collected for 2 years at baseline, 1, 3, 6, 12, 18 and 24 months using validated tools Cost data: Collected from hospital & clinic billing system for 2 years following the date of diagnosis for each woman. Unable to collect some costs such as anesthesiologists, emergency room physicians and radiation oncologists but collected data on the length of hospitalisation and number of visits to a healthcare provider. Full cost data were available for 141 women. Missing cost data for 11 women were imputed using the mean cost data for similar women. The remaining 58 women for whom cost data were incomplete (28 in intervention group; 30 in control) were excluded from the analysis
Notes	The authors refer to the mean age of the women

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Wengstrom 1999

Methods	RCT single centre hospital in Sweden.
Participants	This trial included 134 women with breast cancer Age group 37-83 mean age 61 years. 1. Nurse-led intervention - 30 minutes once a week at week 1 baseline then 3, 5 and follow up at 2 weeks and again at 3 months n=67 2. Standard nursing care n=67 No significant differences found at baseline between the two groups using student's t-test to compare distress and side effects A diagnosis of breast cancer including chest wall and lymph nodes receiving radiotherapy treatment for cure. No restriction based on stage but had to speak and understand English
Interventions	INTERVENTION: Nurse-led intervention as a complement to standard nursing care in the radiotherapy department. First intervention at baseline, emphasis on oral and written cognitive information about simulation and treatment routines - this session lasted 45 minutes as opposed to those later which lasted 30 minutes CONTROL: Standard nursing care
Outcomes	Subjective distress, side effects and quality of life measured by: 1. Instruments Impact of Event Scale (IES scale) a self reported questionnaire containing 15 items including 7 items under the heading intrusion and 8 items of avoidance. 2. Oncology Treatment Toxicity Assessment Tool (OTTAT) a self reported instrument containing 37 items to assess cancer related symptoms including side effects of treatments. Every item is rated on a 5 point scale from none to intolerable. 3. Cancer Rehabilitation Evaluation System (CARES-sf) was used to measure Quality of Life and is a shortened version of a standardised and comprehensive rehabilitation and QoL questionnaire used for cancer patients. This consisted of 59 items and patients were asked to complete a minimum of 37 to a max of 57 items. The ratings change on this from a 5-point scale from 0 does not apply to 4 applies very much. This item is multidimensional with reliability, validity and internal consistency previously documented
Notes	This is the primary study

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Yes	A - Adequate

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Allen 2002	The study did not meet inclusion criteria
Ambler 1999	The study did not meet the inclusion criteria
Bordeleau 2003	The study did not include disaggregated data for nursing
Brown 2002	The study did not meet the inclusion criteria
Cimprich 1993	Outcomes did not meet inclusion criteria
Cleeland 1996	Outcomes did not meet inclusion criteria
Giese-Davis 2002	The study did not meet the inclusion criteria
Goodwin 2003	The study did not include disaggregated data for nursing
Helgeson 1999	The study did not include disaggregated data for nursing
Hughes 2000	The study did not meet the inclusion criteria
Ironson 2002	Insufficient data available
Kolcaba 1999	Outcomes did not meet inclusion criteria
Larsson 1992	The study did not meet the inclusion criteria
Lev 2001	The study did not include disaggregated data for nursing
Maguire 1985	The study did not meet inclusion criteria
Mock 1997	Outcomes did not meet inclusion criteria
Motzer 1997	Outcomes did not meet inclusion criteria
Rolnick 1999	The study did not meet the inclusion criteria
Samarel 2002	The study did not include disaggregated data for nursing
Sameral 1998	The study did not meet the inclusion criteria
Sandgren 2000	The study did not meet inclusion criteria
Sandgren 2003	The study did not meet inclusion criteria

(*Continued*)

Targ 2002	The study did not meet inclusion criteria
Vos 2004	The study did not meet the inclusion criteria
Williams 2004	The study outcomes did not meet inclusion criteria
Wyatt 2004	No nursing intervention

Characteristics of ongoing studies *[ordered by study ID]*

Arving 2006

Trial name or title	Satisfaction, utilisation and perceived benefit of individual psychosocial support for breast cancer patients
Methods	
Participants	179 women with breast cancer
Interventions	Standard care, individual psychosocial support from a trained oncology nurse, individual support by a psychologist
Outcomes	The patient satisfaction questionnaire. Hospital Anxiety and Depression Scale. The Impact of Event Scale.
Starting date	December 1997
Contact information	cecilia.arving@pubcare.uu.se
Notes	The quality of life data has still to be published. The authors were contacted and had anticipated its availability in December 2006 but we do not have the data to present

DATA AND ANALYSES

This review has no analyses.

ADDITIONAL TABLES

Table 1. Quality assessment

Study	Quality Assessment
Maguire 1980	Jadad score: Randomisation identified: 1 Method described: 1 Blinding: 0 Method of blinding 0 Withdrawals/dropouts 1 Deduct 1 if randomisation inappropriate -1 Deduct 1 if blinding inappropriate 0 Overall quality assessment: 2/5
McArdle 1996	Jadad Score: Randomisation identified: 1 Method described: 0 Described as double blind Method of double blinding appropriate: 0 Withdrawals/dropouts: 1 Deduct 1 if randomisation inappropriate: -1 Deduct one if blinding inappropriate: 0 Overall quality assessment: 1 (study described as randomised)
Koinberg 2004	Jadad Score: Randomisation described: 1 Method described: 1 Double blinding: 0 Method of double blinding: 0 Withdrawals/dropouts: 0 Deduct 1 if randomisation inappropriate: 0 Deduct one if blinding inappropriate: 0 Overall quality assessment: 2/5
Ritz 2004	Jadad Score Randomisation described: 1 Method described: 0

Table 1. Quality assessment (*Continued*)

	Described as double blind: 0 Method of double blinding appropriate: 0 Withdrawals/dropouts: 1 Deduct 1 if randomisation inappropriate: -1 Deduct one if blinding inappropriate: 0 Overall quality assessment: 1
Wengstrom	Jadad Score: Randomisation described: 1 Method described: 1 Double blind: 0 Method of double blinding appropriate: 0 Withdrawals/dropouts: 1 Deduct 1 if randomisation inappropriate: -1 Deduct 1 if blinding inappropriate: 0 Overall quality assessment: 2/5

Table 2. Study results

Study	Outcome measure	Intervention group	Control	Results
Koinberg 2004	Aspects of quality of life measured by: 1)Hospital Anxiety and Depression (HAD) Scale 2)Medical record review (MRR) 3)Satisfaction and accessibility (SaaC) scale	Specialist Nurse Group n= 133.	Physician Group (routine follow up) n=131	1. HAD A relative risk (RR) with a 95% confidence interval for the nurse group (NG) over the physician group (PG) was used as a reference. There were no statistically significant differences beteen the groups for either anxiety or depression. Anxiety 6mths - RR 1.8 (95% CI 0.7-4.8) 18mths - RR 1.2 (95% CI 0.4-3.1) 24mths- RR 2.3 (95% CI 0.8-6.9 60mths- RR 1.8 (95% CI 0.6-5.1)

Table 2. Study results (*Continued*)

				Depression 6mths - RR 1.0 (95% CI 0.6-16.4) 18mths - RR 0.5 (95% CI 0.0 -5.8) 24mths- RR 1.0 (95% CI 0.1-7.2) 60mths- RR 1.7 (95% CI 0.4-7.2) 2. SaaC Satisfaction was high over the follow-up period. 6mths - RR 0.6 (95% CI 0.1-3.9) 18mths - RR 1.0 (95% CI 1.0 -1.0) 24mths- RR 0.3 (95% CI 0.0-1.2) 60mths- RR 0.1 (95% CI 0.0-0.9) 3. Medical Safety was considered as part of the MMR The time to recurrence or death was analysed using the Kaplan Meier technique with 95% confidence limits: time to loco-regional recurrence 3% (-2,8)[a], time to distant metastases 0.6% (-6,5)[a], time to any first breast cancer recurrence 2% (-5,9)[a], time to death -0.3% (-10, 9)[3] power in this analyses was low
Maguire 1980	Psychiatric morbidity measured by: 1.Anxiety, depression and sexual problems (Present state examination). 2.Assessment of other stressful life events 3.Mood (Linear analogue scales 12-18 months post	Specialist Nurse Group n =75.	Routine care by surgical unit n=77.	1. Anxiety, depression and sexual problems. No difference between counselled group and control group at 3 months. Comparisons between counselling and control groups at 12-18 months for anxiety states (p<0.01) , depressive illness (p< 0.

Table 2. Study results (*Continued*)

	mastectomy). 4.Semi-structured interview shortly after surgery, 3, and 12-18 months following surgery to assess physical and social recovery in three areas: swelling, pain and disability. reaction to scar, breast loss and prosthesis. house work, social adjustment, return to work.			001) and sexual problems (p<0.02) 2. Recovery after Surgery More counselled women than control were satisfied with scar (p>0.05) , had adapted to breast loss (p>0.05), social adjustment (p>0.05)
McArdle 1996	Psychological morbidity measured by: 1. 28-tem general health questionnaire. 2. Hospital Anxiety and Depression (HAD) Scale.	a) Routine support from ward staff and information booklet (Understanding cancer of the breast: BACUP) plus Breast Care Nurse (BCN) n=70 b) Routine support from ward staff and information booklet (Understanding cancer of the breast: BACUP) plus support from BCN and the voluntary organisation n= 69	a) Routine support from ward staff and information booklet (Understanding cancer of the breast: BACUP) n=67 b) Routine support from ward staff and information booklet (Understanding cancer of the breast: BACUP) plus support from a voluntary organisation (TT) n=66	1. General Health Questionnaire and 2. HAD Psychological morbidity fell over the 12 month period. Scores were consistently lower in patients supported by BCNs. The unadjusted p values were 0.015 (28 general health questionnaire), 0. 027 (anxiety and insomnia), 0.072 (severe depression), 0.053 (somatic symptoms), 0.031 (social dysfunction), 0.093 (HAD - anxiety) and 0.003 (HAD - depression). No other statistical results provided
Ritz 2000	Aspects of quality of life measured by: 1.Mishel Uncertainty in Illness Scale (MUIS). 2. Profile of Mood States (POMS). 3. Functional Assessment of Cancer Therapy (FACT-B). Cost data: Collected from hospital & clinic billing system for 2 years following the date of	Advanced Practice Nurse (APN) Group n=106.	Standard medical care (SMC) Group n=104	1. Uncertainty Uncertainty was significantly reduced in intervention group (p=0.043) at baseline, 1 month (p=0. 001), 3 months (p=0.026) and 6 months (p=0.011) but not at 12 months (p= 0.589). No significant differences between groups in levels of mood (p=0.953) however, unmarried women showed a decrease in mood

Table 2. Study results (*Continued*)

	diagnosis for each woman. Unable to collect some costs such as anesthesiologists, emergency room physicians and radiation oncologists but collected data on the length of hospitalisation and number of visits to a healthcare provider. Full cost data were available for 141 women. Missing cost data for 11 women were imputed using the mean cost data for similar women. The remaining 58 women for whom cost data were incomplete (28 in intervention group; 30 in control) were excluded from the analysis			disturbance in the intervention group at 1 month (p=0.011) and 3 month (p=0.043). Additionally, women with no family history of breast cancer showed a decrease in mood disturbance at 1 month (p=0.002), 3 month (p=0.010) and 6 month (p=0.004). There was no statistical difference between intervention and control groups for well-being but unmarried women in intervention group reported higher levels of well-being at 1 month (p=0.036). Cost data: No significant difference in costs between groups existed. The costs of the APN intervention averaged at $629 per patient. Data collection relating to costs appeared to be problematic with full cost data only available for 141. The study imputed missing cost data for 11 participants using the mean cost data for similar participants. The study excluded the remaining 58 participants for whom cost data were incomplete (28 in intervention group; 30 in control) from the analysis
Wengstrom 1999	Subjective distress, side effects and quality of life measured by: 1. Instruments Impact of Event Scale (IES scale) a	Nurse led intervention n=67	Standard nursing care n=67	1.Distress Patients in the intervention group rated fewer distress reactions than the control (p<0.05) - CI not provided

Table 2. Study results (*Continued*)

	self reported questionnaire containing 15 items including 7 items under the heading intrusion and 8 items of avoidance. 2. Oncology Treatment Toxicity Assessment Tool (OTTAT) a self reported instrument containing 37 items to assess cancer related symptoms including side effects of treatments. Every item is rated on a 5 point scale from none to intolerable. Cancer Rehabilitation Evaluation System 3. (CARES-sf) was used to measure Quality of Life and is a shortened version of a standardised and comprehensive rehabilitation and QoL questionnaire used for cancer patients. This consisted of 59 items and patients were asked to complete a minimum of 37 to a max of 57 items. The ratings change on this from a 5-point scale from 0 does not apply to 4 applies very much. This item is multidimensional with reliability, validity and internal consistency previously documented			2. Side effects The Oncology Treatment Toxicity Assessment Tool showed no significant effect between the two groups in perceived side effects - p value and CI not provided 3. Quality of life While the EG scored higher at baseline on the CARES - sf global score, the intervention had no measurable effect on global QOL - p value and CI not provided The authors carried out a multiple regression analysis to control for differences in treatment dose and type of surgery, however the difference in treatment dose could not explain why the intervention and control groups were similar in perceived side effects

APPENDICES

Appendix 1. Search strategy for Medline (OVID 1966- September 2005)

1 exp breast neoplasms/ (125717)
2 exp "Neoplasms, Ductal, Lobular, and Medullary"/ (14720)
3 exp Fibrocystic Breast Disease/ (2449)
4 or/1-3 (130325)
5 exp breast/ (19852)
6 breast.tw. (148593)
7 5 or 6 (154239)
8 (breast adj milk).ti,ab,sh. (5020)
9 (breast adj tender$).ti,ab,sh. (258)
10 or/8-9 (5278)
11 7 not 10 (148961)
12 exp neoplasms/ (1619750)
13 11 and 12 (117201)
14 exp lymphedema/ (5798)
15 14 and 11 (507)
16 (breast adj25 neoplasm$).ti,ab,sh. (4491)
17 (breast adj25 cancer$).ti,ab,sh. (93726)
18 (breast adj25 tumour$).ti,ab,sh. (8002)
19 (breast adj25 tumor$).ti,ab,sh. (30301)
20 (breast adj25 carcinoma$).ti,ab,sh. (30103)
21 (breast adj25 adenocarcinoma$).ti,ab,sh. (3098)
22 (breast adj25 sarcoma$).ti,ab,sh. (1513)
23 (breast adj50 dcis).ti,ab,sh. (1119)
24 (breast adj25 ductal).ti,ab,sh. (4609)
25 (breast adj25 infiltrating).ti,ab,sh. (1628)
26 (breast adj25 intraductal).ti,ab,sh. (1020)
27 (breast adj25 lobular).ti,ab,sh. (1804)
28 (breast adj25 medullary).ti,ab,sh. (393)
29 or/16-28 (116361)
30 4 or 13 or 15 or 29 (153912)
31 exp mastectomy/ (14410)
32 30 or 31 (155831)
33 exp "ANALYTICAL, DIAGNOSTIC AND THERAPEUTIC TECHNIQUES AND EQUIPMENT"/ (8790014)
34 33 and 11 (120040)
35 34 or 32 (171896)
36 exp mammary neoplasms/ (14579)
37 (mammary adj25 neoplasm$).ti,ab,sh. (628)
38 (mammary adj25 cancer$).ti,ab,sh. (6214)
39 (mammary adj25 tumour$).ti,ab,sh. (2447)
40 (mammary adj25 tumor$).ti,ab,sh. (13352)
41 (mammary adj25 carcinoma$).ti,ab,sh. (7574)
42 (mammary adj25 adenocarcinoma$).ti,ab,sh. (2612)
43 (mammary adj25 sarcoma$).ti,ab,sh. (497)
44 (mammary adj50 dcis).ti,ab,sh. (88)
45 (mammary adj25 ductal).ti,ab,sh. (1145)
46 (mammary adj25 infiltrating$).ti,ab,sh. (253)
47 (mammary adj25 intraductal$).ti,ab,sh. (224)
48 (mammary adj25 lobular).ti,ab,sh. (282)
49 (mammary adj25 medullary).ti,ab,sh. (60)

50 or/36-49 (27625)
51 35 or 50 (188466)
52 exp breast self examination/ (736)
53 (breast adj25 self$).ti,ab,sh. (2579)
54 (breast adj25 screen$).ti,ab,sh. (8737)
55 exp mammography/ (15692)
56 or/51-55 (190550)
57 mammograph$.tw. (12822)
58 57 and 11 (9452)
59 56 or 58 (190559)
60 randomized controlled trial.pt. (206425)
61 controlled clinical trial.pt. (69387)
62 randomized controlled trials.sh. (39195)
63 random allocation.sh. (53837)
64 double-blind method.sh. (83248)
65 single blind method.sh. (9290)
66 or/60-65 (351133)
67 clinical trial.pt. (415676)
68 exp clinical trials/ (169873)
69 (clin$ adj25 trial$).ti,ab. (114055)
70 ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. (82599)
71 placebos.sh. (24028)
72 placebo$.ti,ab. (90784)
73 random$.ti,ab. (318857)
74 research design.sh. (41712)
75 or/67-74 (746854)
76 66 or 75 (767881)
77 59 and 76 (21791)
78 animals.mp. not human.sh. [mp=title, original title, abstract, name of substance word, subject heading word] (3821636)
79 77 not 78 (19682)
80 exp breast neoplasms/nu (791)
81 exp nurse clinicians/ (5322)
82 exp nurse's role/ (11077)
83 exp oncologic nursing/ (3794)
84 exp nurse practitioner/ (10513)
85 (cancer adj25 nurs$).ti,ab,sh. (5221)
86 (breast adj25 nurs$).ti,ab,sh. (2025)
87 (support$ adj25 (care or caring)).ti,ab,sh. (29900)
88 or/80-87 (61658)
89 exp palliative care/ (23943)
90 palliat$.ti,ab,sh. (36729)
91 or/89-90 (36729)
92 79 and 88 (392)
93 79 and 91 (452)
94 from 93 keep 1-452 (452)

Appendix 2. Search strategy for CINAHL (OVID 1982-September 2005)

1 exp breast neoplasms/ (11134)
2 exp "Neoplasms, Ductal, Lobular, and Medullary"/ (9)
3 exp Fibrocystic Breast Disease/ (94)
4 or/1-3 (11188)
5 exp breast/ (677)
6 breast.tw. (12267)
7 5 or 6 (12548)
8 (breast adj milk).ti,ab,sh. (598)
9 (breast adj tender$).ti,ab,sh. (20)
10 or/8-9 (618)
11 7 not 10 (11930)
12 exp neoplasms/ (47708)
13 11 and 12 (8522)
14 exp lymphedema/ (487)
15 14 and 11 (132)
16 (breast adj25 neoplasm$).ti,ab,sh. (32)
17 (breast adj25 cancer$).ti,ab,sh. (8366)
18 (breast adj25 tumour$).ti,ab,sh. (91)
19 (breast adj25 tumor$).ti,ab,sh. (431)
20 (breast adj25 carcinoma$).ti,ab,sh. (269)
21 (breast adj25 adenocarcinoma$).ti,ab,sh. (13)
22 (breast adj25 sarcoma$).ti,ab,sh. (16)
23 (breast adj50 dcis).ti,ab,sh. (20)
24 (breast adj25 ductal).ti,ab,sh. (92)
25 (breast adj25 infiltrating).ti,ab,sh. (18)
26 (breast adj25 intraductal).ti,ab,sh. (17)
27 (breast adj25 lobular).ti,ab,sh. (27)
28 (breast adj25 medullary).ti,ab,sh. (3)
29 or/16-28 (8544)
30 4 or 13 or 15 or 29 (12417)
31 exp mastectomy/ (1061)
32 30 or 31 (12689)
33 exp "ANALYTICAL, DIAGNOSTIC AND THERAPEUTIC TECHNIQUES AND EQUIPMENT"/ (0)
34 33 and 11 (0)
35 34 or 32 (12689)
36 exp mammary neoplasms/ (0)
37 (mammary adj25 neoplasm$).ti,ab,sh. (1)
38 (mammary adj25 cancer$).ti,ab,sh. (39)
39 (mammary adj25 tumour$).ti,ab,sh. (4)
40 (mammary adj25 tumor$).ti,ab,sh. (22)
41 (mammary adj25 carcinoma$).ti,ab,sh. (11)
42 (mammary adj25 adenocarcinoma$).ti,ab,sh. (3)
43 (mammary adj25 sarcoma$).ti,ab,sh. (1)
44 (mammary adj50 dcis).ti,ab,sh. (0)
45 (mammary adj25 ductal).ti,ab,sh. (4)
46 (mammary adj25 infiltrating$).ti,ab,sh. (1)
47 (mammary adj25 intraductal$).ti,ab,sh. (0)
48 (mammary adj25 lobular).ti,ab,sh. (0)
49 (mammary adj25 medullary).ti,ab,sh. (0)
50 or/36-49 (55)
51 35 or 50 (12702)

52 exp breast self examination/ (808)
53 (breast adj25 self$).ti,ab,sh. (1043)
54 (breast adj25 screen$).ti,ab,sh. (1453)
55 exp mammography/ (2407)
56 or/51-55 (13723)
57 mammograph$.tw. (1545)
58 57 and 11 (911)
59 56 or 58 (13725)
60 randomized controlled trial.pt. (0)
61 controlled clinical trial.pt. (0)
62 randomized controlled trials.sh. (0)
63 random allocation.sh. (0)
64 double-blind method.sh. (0)
65 single blind method.sh. (0)
66 or/60-65 (0)
67 clinical trial.pt. (14956)
68 exp clinical trials/ (32936)
69 (clin$ adj25 trial$).ti,ab. (10482)
70 ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. (4822)
71 placebos.sh. (2824)
72 placebo$.ti,ab. (6470)
73 random$.ti,ab. (32132)
74 research design.sh. (0)
75 or/67-74 (54571)
76 66 or 75 (54571)
77 59 and 76 (1610)
78 animals.mp. not human.sh. [mp=title, subject heading word, abstract, instrumentation] (2134)
79 77 not 78 (1607)
80 exp breast neoplasms/nu (211)
81 exp nurse clinicians/ (2880)
82 exp nurse's role/ (0)
83 exp oncologic nursing/ (6052)
84 exp nurse practitioner/ (7486)
85 (cancer adj25 nurs$).ti,ab,sh. (4485)
86 (breast adj25 nurs$).ti,ab,sh. (1209)
87 (support$ adj25 (care or caring)).ti,ab,sh. (13839)
88 or/80-87 (31752)
89 exp palliative care/ (4935)
90 palliat$.ti,ab,sh. (6556)
91 or/89-90 (6556)
92 79 and 88 (173)
93 79 and 91 (26)
94 from 93 keep 1-26 (26)

Appendix 3. Search strategy EMBASE (OVID 1980-September 2005)

1 exp breast cancer/ (110263)
2 exp neoplasms/ and medullary.mp. (5731)
3 exp fibrocystic disease of breast/ (538)
4 or/1-3 (115736)
5 exp breast/ (36787)
6 breast.tw. (122844)
7 5 or 6 (139515)
8 (breast adj milk).ti,ab,sh. (4860)
9 (breast adj tender$).ti,ab,sh. (260)
10 or/8-9 (5120)
11 7 not 10 (134395)
12 exp neoplasms/ (1162318)
13 11 and 12 (103921)
14 exp lymphedema/ (3132)
15 14 and 11 (527)
16 (breast adj25 neoplasm$).ti,ab,sh. (1792)
17 (breast adj25 cancer$).ti,ab,sh. (83412)
18 (breast adj25 tumour$).ti,ab,sh. (7529)
19 (breast adj25 tumor$).ti,ab,sh. (26684)
20 (breast adj25 carcinoma$).ti,ab,sh. (24751)
21 (breast adj25 adenocarcinoma$).ti,ab,sh. (2538)
22 (breast adj25 sarcoma$).ti,ab,sh. (1306)
23 (breast adj25 dcis).ti,ab,sh. (949)
24 (breast adj25 ductal).ti,ab,sh. (4222)
25 (breast adj25 infiltrating).ti,ab,sh. (1467)
26 (breast adj25 intraductal).ti,ab,sh. (859)
27 (breast adj25 lobular).ti,ab,sh. (1556)
28 (breast adj25 medullary).ti,ab,sh. (357)
29 or/16-28 (100438)
30 4 or 13 or 15 or 29 (137025)
31 exp mastectomy/ (10071)
32 30 or 31 (138187)
33 exp mammary neoplasms/ (111055)
34 (mammary adj25 neoplasm$).ti,ab,sh. (418)
35 (mammary adj25 cancer$).ti,ab,sh. (5140)
36 (mammary adj25 tumour$).ti,ab,sh. (1787)
37 (mammary adj25 tumor$).ti,ab,sh. (10400)
38 (mammary adj25 carcinoma$).ti,ab,sh. (6222)
39 (mammary adj25 adenocarcinoma$).ti,ab,sh. (2062)
40 (mammary adj25 sarcoma$).ti,ab,sh. (328)
41 (mammary adj25 dcis).ti,ab,sh. (62)
42 (mammary adj25 ductal).ti,ab,sh. (939)
43 (mammary adj25 infiltrating).ti,ab,sh. (211)
44 (mammary adj25 inrtaductal).ti,ab,sh. (0)
45 (mammary adj25 lobular).ti,ab,sh. (226)
46 (mammary adj25 medullary).ti,ab,sh. (43)
47 or/33-46 (126999)
48 32 or 47 (245251)
49 exp breast self examination/ (17759)
50 (breast adj25 self$).ti,ab,sh. (1979)
51 (breast adj25 screen$).ti,ab,sh. (7406)

52 exp mammography/ (15038)
53 or/48-52 (249496)
54 mammograph$.tw. (10617)
55 54 and 11 (8351)
56 53 or 55 (249567)
57 exp clinical trial/ (360000)
58 comparative study/ (66902)
59 drug comparison/ (81244)
60 major clinical study/ (992273)
61 randomization/ (16175)
62 crossover procedure/ (16647)
63 double blind procedure/ (57117)
64 single blind procedure/ (5507)
65 placebo/ (80452)
66 prospective study/ (49825)
67 ((clinical or controlled or comparative or placebo or prospective or randomi#ed) adj3 (trial or study)).ti,ab. (276562)
68 (random$ adj7 (allocat$ or allot$ or assign$ or basis$ or divid$ or order$)).ti,ab. (58270)
69 ((singl$ or doubl$ or trebl$ or tripl$) adj7 (blind$ or mask$)).ti,ab. (77858)
70 (cross?over$ or (cross adj1 over$)).ti,ab. (32543)
71 or/57-70 (1544853)
72 56 and 71 (54915)
73 limit 72 to human (52259)
74 exp nursing/ (11411)
75 exp nurse/ (11251)
76 exp nurse practitioner/ (1223)
77 or/74-76 (22708)
78 (cancer adj25 nurs$).ti,ab,sh. (2008)
79 (breast adj25 nurs$).ti,ab,sh. (1134)
80 (support$ adj25 (care or caring)).ti,ab,sh. (21107)
81 or/78-80 (23617)
82 77 or 81 (44401)
83 73 and 82 (585)
84 exp palliative therapy/ (15842)
85 exp hospice care/ (314)
86 or/84-85 (15950)
87 (palliat$ or hospice$).ti,ab. (21434)
88 86 or 87 (27318)
89 73 and 88 (745)
90 from 89 keep 1-200 (200)
91 from 89 keep 201-400 (200)
92 from 89 keep 401-600 (200)

Appendix 4. 4 Search strategy PsycINFO (OVID 1967 to September 2005)

1 exp breast cancer/ (1010)
2 exp neoplasms/ and medullary.mp. (9)
3 (fibrocystic adj25 disease$).ti,ab,sh. (20)
4 or/1-3 (1039)
5 exp breast/ (403)
6 breast.ti,ab,sh. (5745)
7 5 or 6 (5745)
8 (breast adj milk).ti,ab,sh. (162)
9 (breast adj tender$).ti,ab,sh. (26)
10 or/8-9 (188)
11 7 not 10 (5557)
12 exp neoplasms/ (15300)
13 11 and 12 (3484)
14 lymphedema$.ti,ab,sh. (19)
15 14 and 11 (14)
16 (breast adj25 neoplasm$).ti,ab,sh. (39)
17 (breast adj25 cancer$).ti,ab,sh. (3907)
18 (breast adj25 tumour$).ti,ab,sh. (16)
19 (breast adj25 tumor$).ti,ab,sh. (104)
20 (breast adj25 carcinoma$).ti,ab,sh. (60)
21 (breast adj25 adenocarcinoma$).ti,ab,sh. (3)
22 (breast adj25 sarcoma$).ti,ab,sh. (3)
23 (breast adj25 dcis).ti,ab,sh. (5)
24 (breast adj25 ductal).ti,ab,sh. (10)
25 (breast adj25 infiltrating).ti,ab,sh. (1)
26 (breast adj25 intraductal).ti,ab,sh. (1)
27 (breast adj25 lobular).ti,ab,sh. (1)
28 (breast adj25 medullary).ti,ab,sh. (2)
29 or/16-28 (3955)
30 4 or 13 or 15 or 29 (4599)
31 exp mastectomy/ (308)
32 30 or 31 (4720)
33 exp mammary neoplasms/ (3183)
34 (mammary adj25 neoplasm$).ti,ab,sh. (0)
35 (mammary adj25 cancer$).ti,ab,sh. (16)
36 (mammary adj25 tumour$).ti,ab,sh. (0)
37 (mammary adj25 tumor$).ti,ab,sh. (26)
38 (mammary adj25 carcinoma$).ti,ab,sh. (12)
39 (mammary adj25 adenocarcinoma$).ti,ab,sh. (4)
40 (mammary adj25 sarcoma$).ti,ab,sh. (0)
41 (mammary adj25 dcis).ti,ab,sh. (0)
42 (mammary adj25 ductal).ti,ab,sh. (2)
43 (mammary adj25 infiltrating).ti,ab,sh. (0)
44 (mammary adj25 inrtaductal).ti,ab,sh. (0)
45 (mammary adj25 lobular).ti,ab,sh. (0)
46 (mammary adj25 medullary).ti,ab,sh. (0)
47 or/33-46 (3209)
48 32 or 47 (4841)
49 (breast adj25 (self adj examination$)).ti,ab,sh. (381)
50 (breast adj25 self$).ti,ab,sh. (902)
51 (breast adj25 screen$).ti,ab,sh. (691)

52 exp mammography/ (481)
53 or/48-52 (5232)
54 mammograph$.tw. (681)
55 54 and 11 (447)
56 53 or 55 (5237)
57 exp clinical trials/ (1433)
58 exp empirical methods/ (15439)
59 (comparative adj stud$).ti,ab,sh. (6808)
60 (drug adj comparison$).ti,ab,sh. (16)
61 (major adj (clinical adj stud$)).ti,ab,sh. (5)
62 placebo/ (1750)
63 prospective studies/ (281)
64 ((clinical or controlled or comparative or placebo or prospective or randomi#ed) adj3 (trial or study)).ti,ab. (31387)
65 (random$ adj7 (allocat$ or allot$ or assign$ or basis$ or divid$ or order$)).ti,ab. (20178)
66 ((singl$ or doubl$ or trebl$ or tripl$) adj7 (blind$ or mask$)).ti,ab. (11618)
67 (cross?over$ or (cross adj1 over$)).ti,ab. (3819)
68 or/57-67 (74722)
69 56 and 68 (477)
70 limit 69 to human (472)
71 exp nursing/ (5282)
72 exp nurses/ (10647)
73 (nurs$ adj25 practitioner$).ti,ab,sh. (1289)
74 or/71-73 (14760)
75 (cancer adj25 nurs$).ti,ab,sh. (568)
76 (breast adj25 nurs$).ti,ab,sh. (185)
77 (support$ adj25 (care or caring)).ti,ab,sh. (10511)
78 or/75-77 (11113)
79 74 or 78 (24904)
80 70 and 79 (22)
81 exp palliative care/ (2638)
82 exp hospice/ (1254)
83 (palliat$ or hospice$).ti,ab. (4097)
84 or/81-83 (4688)
85 70 and 84 (1)
86 from 85 keep 1 (1)

Appendix 5. Search strategy British Nursing Index (OVID 1984 - September 2005)

1. exp breast neoplasms/
2. exp "Neoplasms, Ductal, Lobular, and Medullary"/
3. exp Fibrocystic Breast Disease/
4. or/1-3
5. exp breast/
6. breast.tw.
7. 5 or 6
8. (breast adj milk).ti,ab,sh.
9. (breast adj tender$).ti,ab,sh.
10. or/8-9
11. 7 not 10
12. exp neoplasms/
13. 11 and 12
14. exp lymphedema/

15. 14 and 11
16. (breast adj25 neoplasm$).ti,ab,sh.
17. (breast adj25 cancer$).ti,ab,sh.
18. (breast adj25 tumour$).ti,ab,sh.
19. (breast adj25 tumor$).ti,ab,sh.
20. (breast adj25 carcinoma$).ti,ab,sh.
21. (breast adj25 adenocarcinoma$).ti,ab,sh.
22. (breast adj25 sarcoma$).ti,ab,sh.
23. (breast adj50 dcis).ti,ab,sh.
24. (breast adj25 ductal).ti,ab,sh.
25. (breast adj25 infiltrating).ti,ab,sh.
26. (breast adj25 intraductal).ti,ab,sh.
27. (breast adj25 lobular).ti,ab,sh.
28. (breast adj25 medullary).ti,ab,sh.
29. or/16-28
30. 4 or 13 or 15 or 29
31. exp mastectomy/
32. 30 or 31
33. exp "ANALYTICAL, DIAGNOSTIC AND THERAPEUTIC TECHNIQUES AND EQUIPMENT"/
34. 33 and 11
35. 34 or 32
36. exp mammary neoplasms/
37. (mammary adj25 neoplasm$).ti,ab,sh.
38. (mammary adj25 cancer$).ti,ab,sh.
39. (mammary adj25 tumour$).ti,ab,sh.
40. (mammary adj25 tumor$).ti,ab,sh.
41. (mammary adj25 carcinoma$).ti,ab,sh.
42. (mammary adj25 adenocarcinoma$).ti,ab,sh.
43. (mammary adj25 sarcoma$).ti,ab,sh.
44. (mammary adj50 dcis).ti,ab,sh.
45. (mammary adj25 ductal).ti,ab,sh.
46. (mammary adj25 infiltrating$).ti,ab,sh.
47. (mammary adj25 intraductal$).ti,ab,sh.
48. (mammary adj25 lobular).ti,ab,sh.
49. (mammary adj25 medullary).ti,ab,sh.
50. or/36-49
51. 35 or 50
52. exp breast self examination/
53. (breast adj25 self$).ti,ab,sh.
54. (breast adj25 screen$).ti,ab,sh.
55. exp mammography/
56. or/51-55
57. mammograph$.tw.
58. 57 and 11
59. 56 or 58
60. randomized controlled trial.pt.
61. controlled clinical trial.pt.
62. randomized controlled trials.sh.
63. random allocation.sh.
64. double-blind method.sh.
65. single blind method.sh.
66. or/60-65
67. clinical trial.pt.

68. exp clinical trials/
69. (clin$ adj25 trial$).ti,ab.
70. ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab.
71. placebos.sh.
72. placebo$.ti,ab.
73. random$.ti,ab.
74. research design.sh.
75. or/67-74
76. 66 or 75
77. 59 and 76
78. animals.mp. not human.sh. [mp=heading words, title]
79. 77 not 78
80. exp breast neoplasms/nu
81. exp nurse clinicians/
82. exp nurse's role/
83. exp oncologic nursing/
84. exp nurse practitioner/
85. (cancer adj25 nurs$).ti,ab,sh.
86. (breast adj25 nurs$).ti,ab,sh.
87. (support$ adj25 (care or caring)).ti,ab,sh.
88. or/80-87
89. exp palliative care/
90. palliat$.ti,ab,sh.
91. or/89-90
92. 79 and 88
93. 79 and 91

Appendix 6. Search strategy LISA (OVID 13/04/2006)

(DE="breast cancer") or (neoplasm* and medullary*) or (fibrocystic near disease*) or (DE="breast cancer") or (neoplasm* and medullary*) or (fibrocystic near disease*) or (breast$) not ((breast near milk) or (breast near tender) and (neoplasm$) or (lymphedema$) and (DE="breast cancer") or (neoplasm* and medullary*) or (fibrocystic near disease*) or (breast$) not ((breast near milk) or (breast near
tender) or (mastectom*) or (mammary near neoplasm*) or (breast near (self and examination) or (mammography)

WHAT'S NEW

Last assessed as up-to-date: 14 January 2007.

Date	Event	Description
11 June 2008	Amended	Converted to new review format.

HISTORY

Protocol first published: Issue 1, 2006

Review first published: Issue 1, 2008

Date	Event	Description
12 November 2007	New citation required and conclusions have changed	First publication review
19 June 2006	New search has been performed	First publication protocol

CONTRIBUTIONS OF AUTHORS

All authors were involved in the development of the protocol for this review. All authors reviewed drafts and were responsible for the writing of the final review.

DECLARATIONS OF INTEREST

None known

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Internal sources

- No sources of support supplied

External sources

- Centre for Integrated Healthcare Research Edinburgh, UK.

INDEX TERMS

Medical Subject Headings (MeSH)

*Oncology Nursing; *Quality of Life; Anxiety [nursing]; Breast Neoplasms [*nursing; psychology]; Depression [nursing]; Randomized Controlled Trials as Topic

MeSH check words

Female; Humans