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Review

A nurse is a nurse? A systematic review of the effectiveness of specialised nursing in breast cancer

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ABSTRACT

The effectiveness of specialised nursing in breast cancer has received limited attention. This systematic literature review aims at (i) presenting and discussing role models of specialised nursing in the area of breast cancer and (ii) suggesting avenues for future research in this field. The ten studies included in the review differ with respect to the roles of specialised nurses as well as the measured outcome variables; thus, the comparability and generalisability of results are limited. Nevertheless, the review indicates that specialised nursing in breast cancer may contribute to improved physical and psycho-social well-being. In view of the limited comparability, the authors call for (i) a more uniform definition of models of specialised nursing in breast cancer care, as well as (ii) rigorous confirmatory studies to evaluate their effectiveness. These two aspects are pivotal in providing a reliable basis for future health care strategies.

1. Introduction

The diagnosis of breast cancer initiates a complex process of coping with disease and different therapies. This process includes physical and psychosocial issues involving wide-ranging treatment and care needs. Thus, women with breast cancer require comprehensive nursing interventions. As breast cancer is one of the most intensively investigated areas in oncology, innovations are frequent, making breast cancer care a rapidly changing specialty. The current trend of establishing breast centres is paralleled by an increasing interest in specialised breast cancer nursing in Europe.[1]

In Anglo-American and Scandinavian countries, nursing of women in breast centres has been provided by specialised nurses, namely Breast Care Nurses (BCN), for at least the past 20 years.[2,3] Nurse specialists can be divided into nurse practitioners and clinical nurse specialists. In clinical practice, however, a variety of other role models of specialised nursing in breast cancer can be found. The United Kingdom is the first country to have defined the role of Breast Care Nurses on a national level: 'Breast Care Nurse' (level 1) refers to graduate nurses with postgraduate training in Breast Care Nursing, 'Clinical Nurse Specialist' (level 2) refers to BCNs with a Master's degree, and Clinical Nurse Specialists with a PhD in the breast care area are 'Nurse Consultants' (level 3).[4]

To date, few publications have explored and discussed educational models and competency standards for specialised nurses in the field of breast cancer care. A systematic search in December 2005 in the databases CINAHL (Cumulative Index to Nursing and Allied Health Literature) ('Breast

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Table 1 – Education programs for Breast Care Nurses - examples from United Kingdom, Australia and Ireland

Country	UK	Australia	Ireland
Source	Amir, 2004;[5] Burnet, 2004;[6] Royal College of Nursing, 2002[4]	Dixon, 2001;[7] Hordern, 2000;[8] Liebert, 2001,[9] http://www.cancervic.org.au/cancer1/patients/supportServices/education-breastCancerNurse.htm	www.ucd.ie/nmhs/Postgraduate/hdip.cancer.pdf
Development	Since 1970/80s	Since 1997 (tertiary level)	Since 1999
Entrance requirements/ selection criteria	Registered nurse working in the area of breast cancer (at least 2 years)	Registered nurse working in the area of breast cancer	Registered General Nurse with a minimum of 1 year post-registration with experience at time of application and employment in an oncology unit
Structure and duration	No standardised structure and duration Example: ENB A 11 consisting of two modules (each 12 weeks). Placements in clinical practice (Breast Centres)	Tertiary-level training with three units Distance education program. One-day placements	Part-time course in Oncology Nursing with 'Breast Care' as an optional model. (4 Semester) 10 day-placements
Degree/title	Breast Care Nurse with opportunity to graduate as Clinical Nurse Specialist or Nurse Consultant	Graduate Certificate in Breast Care Nursing with the opportunity to graduate with Post Graduate Diploma of Nursing Science in Breast Care	Higher Diploma in Nursing Studies (Cancer Nursing)

Neoplasms', 'Education-Nursing', 'Curriculum Development', 'Professional Competence', 'Advanced Practice Nursing', 'Professional Development') and Medline (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi) ('Nurse Clinician'[MeSH] OR 'Education, Nursing' [MeSH] AND 'Breast Neoplasms' [MeSH]), as well as a search for related articles, resulted in a small number of publications[5–9] leading more deeply into the description of education models in the field. On the basis of expert interviews and online publications, a broad diversity of established Breast Care Nursing education programs can be illustrated (cf. Table 1).

Two meta-analyses found only weak indications of the effectiveness of psychological interventions by specialised nurses for cancer-patients.[10,11] To date, a systematic overview of the effectiveness of specialised nurses beyond psychological considerations is still lacking. Thus, we conducted a systematic literature search in January 2006, that aimed at examining and summarising the state of the art with respect to the effectiveness of specialised nursing in breast cancer care. Our analysis provides (i) a basis for developing new services and training in this area and (ii) a starting point for further research.

2. Methods

The review is based on a systematic search of the medical databases MEDLINE and CINAHL for articles published between 1980 and 2006.

Initially, the 383 matches were assessed with regard to the following inclusion criteria.

- study describes and analyses specialised nursing in a comparative design
- article is written in German or English language
- selection of the sampling relates to women with breast cancer

Table 2 – Search strategy and results of the data based literature search

Search terms	Limits	Results	Included
CINAHL: 'Specialisation' AND 'Breast Neoplasms'	1982 – 2006	2	0
CINAHL: 'Breast Neoplasms' AND 'Advanced Nursing Practice'	1982 – 2006	26	1
Medline: 'Specialties, Nursing' [MeSH] OR 'Oncologic Nursing' [MeSH] AND 'Breast Neoplasms' [MeSH]	1982 – 2006	354	5
Secondary search: 'snowball sampling'			4
Total		382	**10**

Table 3 – Synopsis of study designs, results and quality of studies, sorted by levels of evidence

Authors Country	Study type Aim Intervention versus control Definition of specialised nursing	Sample	Instruments Outcomes	Main results (significant results)	Details of evidence (Ver-haagen, 1998)		Level of evidence (Muir Gray, 1999)[14]	
					Auth 1	Auth 2	Auth 1	Auth 2
1. Goodwin et al., 2003[18] USA	• Randomised prospective trial • Effect of nurse case management on treatment of older women with breast cancer • Nurse case management versus traditional care by a surgeon • Baccalaureate degree registered nurses with 40 h of training from advanced practice nurses offering nurse case management	• $N = 335$ • Women aged 65 and older • Newly diagnosed women with breast cancer	• Self designed instruments • Primary outcome: Treatment received in the first 6 months after diagnosis • Secondary outcome: Evaluation process, patient satisfaction with decision making, arm function	More breast conserving surgery (28.6% versus 18.7%; $p = 0.031$) and radiation therapy (36.0% versus 19.0%; $p = 0.003$) in IG More adjuvant radiation therapy (78.3% versus 44.8%; $p = 0.001$) and axillary dissection (71.4% versus 44.8%; $p = 0.057$) in patients undergoing breast conserving therapy in IG More breast reconstruction surgery (9.3% versus 2.6%; $p = 0.054$) in IG More chemotherapy (72.7% versus 30.0%; $p = 0.057$) in patients with advanced disease in IG Two months after surgery more normal arm function (93% versus 84%; $p = 0.037$) and higher satisfaction with choice of treatment (82.2% versus 69.9%; $p = 0.020$) in IG	7	7	II	II
2. Koinberg et al., 2004[23] S	• Randomised longitudinal multi-centre study • Effect of nurse led follow up on patients' well-being, satisfaction, access to medical care and medical safety • On-demand nurse-led follow-up versus physician follow-up • Nurse with non-formal specialisation in follow-up care of breast cancer patients	• $N = 264$ • Newly diagnosed breast cancer patients	• Hospital Anxiety and Depression Scale; Satisfaction and Accessibility Scale • Outcome: Anxiety and depression; satisfaction with access to medical centres and phone services; time to recurrence or death	No significant differences in IG and CG	4	4	II	II

(*continued on next page*)

Table 3 – *continued*

Authors Country	Study type Aim Intervention versus control Definition of specialised nursing	Sample	Instruments Outcomes	Main results (significant results)	Details of evidence (Ver-haagen, 1998)		Level of evidence (Muir Gray, 1999)[14]	
					Auth 1	Auth 2	Auth 1	Auth 2
3. McArdle et al., 1996[21] UK	• Randomised controlled trial • Effect of counselling by specialised nurse on psychological condition • Routine care from ward nurses versus routine care including counselling by a specialised nurse versus routine care and voluntary support organisation • Long term experienced, non-formal trained nurse with research experience	• $N = 272$ • Women aged 70 or less • Women undergoing surgery for breast cancer	• Self-rating scale on general health and psychological morbidity (general health questionnaire, hospital anxiety and depression scale) • Outcome: General health; psychological morbidity	Psychological morbidity generally tends to fall over a 12 month period Significant reduction in psychological morbidity concerning general health condition ($p = 0.015$); anxiety and insomnia ($p = 0.027$); social dysfunction ($p = 0.031$) and hospital depression ($p = 0.003$) in group who received counselling by specialised nurse versus all other groups	4	4	II	II
4. Ritz et al., 2000[16] USA	• Randomised clinical trial • Effects of advanced practice nursing care on quality of life and cost outcomes • Advanced nursing care plus standard care versus medical care • Advanced Practice Nurse with a master's degree in nursing with in-depth knowledge and skills in the care of specific patient population	• $N = 210$ • Women aged 30–85 • Women with newly diagnosed breast cancer	• Modified Brootens cost-quality model • Mishel Uncertainty and Illness Scale, Profile of Moods Statement, Functional Assessment of Cancer Therapy • Outcome: Cost-quality differences; uncertainty; mood; quality of life	No significant cost differences Significantly faster decrease of uncertainty from baseline at 1 ($p = 0.001$), 3 ($p = 0.026$) and 6 months ($p = 0.011$) after diagnosis in IG	2	3	II	II

5. Watson et al., 1988[17] UK	• Randomised controlled trial • Effect of specialised nurse counselling on physical and psychological outcome • Routine care versus routine care plus counselling by a nurse counsellor (including home visits) • Registered Nurse with a postgraduate training as Breast Care Nurse	• $N = 40$ • Women with early stage breast cancer and mastectomy	• Profile Mood States; Coutrauld Emotional Control Scale; Spielberger State-Trait Anxiety Inventory; Health Locus of Control Scale; Checklist of problems • Outcome: Mood disturbance; emotional reaction, anxiety; Health Locus of Control; physical symptoms	• Less depressed patients 3 months after the operation ($p = 0.05$) in IG • Significantly increased vigour ($p = 0.03$) in IG between week 1 and 12 in IG • At 12 months there were no significant group-differences in mood disturbances • No significant differences in anxiety levels and physical symptoms • Greater feelings of internal control over health ($p = 0.03$) in IG	3	3	III	II
6. Maguire et al., 1983[19] UK	• Randomised controlled trial • Effect of nurse counselling on physical disability and social recovery • Care including specialised nurse versus normal care on surgical unit • Non-formal trained specialised nurse offering counselling after surgery and follow-up consultations	• $N = 152$ • Women with modified radical mastectomy and full axillary clearance	• Semi-structured interviews and measurement of arm circumference • Outcome: Physical and social recovery	No significant differences between IG and CG concerning physical recovery except improved pain prophylaxis ($p = 0.05$) Better coping with scar ($p = 0.05$); prosthesis ($p = 0.02$) and breast loss ($p = 0.05$) in IG Less difficulties with housework ($p = 0.05$); social adaptation ($p = 0.05$) and return to work ($p = 0.05$)	2	2	III	II

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Table 3 – *continued*

Authors Country	Study type Aim Intervention versus control Definition of specialised nursing	Sample	Instruments Outcomes	Main results (significant results)	Details of evidence (Ver-haagen, 1998)		Level of evidence (Muir Gray, 1999)[14]	
					Auth 1	Auth 2	Auth 1	Auth 2
7. Maguire et al., 1980[20] UK	• Randomised controlled trial • Effect of counselling on psychiatric morbidity associated with mastectomy • Care including specialised nurse versus normal care on surgical unit • Non-formal trained specialised nurse offering counselling after surgery and follow-up consultation	• $N = 152$ • Women with modified radical mastectomy and full axillary clearance	• Semi-structured interviews and shortened Brown-Birley-life events schedule • Outcome: Anxiety state; depressive illness; sexual problems	No significant differences between IG and CG concerning prevention of psychiatric morbidity Better outcome in self-reported anxiety ($p = 0.001$) and depression ($p = 0.001$) in IG Shorter episodes of psychiatric morbidity ($p = 0.001$) in IG Better recognition of patient at risk for psychiatric morbidity ($p = 0.001$) and referral to psychiatrist ($p = 0.001$) in IG	2	2	III	II
8. Weng ström et al., 2001[24] S	• Randomised trial • Effects of nursing intervention on coping ability during radiation therapy • Care including specialised nursing intervention versus conventional care during radiation therapy • Non-formally trained specialised nurse; intervention based on Orem's model of self-care theory	• $N = 134$ • Women • Women with breast cancer beginning radiotherapy	• Wheel Questionnaire • Outcome: Structure, motivation, coping	No significant differences in coping abilities (The authors' finding, that in the subgroup of women over age 59 there was a difference between IG and CG seems to be a post-hoc exploratory subgroup analysis)	2	3	III	III

9. Liebert et al., 2003[15] AU	• Multicentre case-control study • Feasibility, implementation, acceptability and impact of an evidence based specialist breast care nurse model • Specialist Breast Nurse versus traditional nursing care • Clinical nurse specialists or clinical nurse consultants accredited as Specialist Breast Care Nurse (SBN)	• $N = 300$ breast cancer patients 6–12 months after diagnosis • $N = 47$ health professionals	• Prospective logs (structured documentation of nursing interventions) • Outcome: Patient- satisfaction with needs, documentation; experience with SBN	98% reported that availability of SBN would affect their choice of hospital Significant differences: Higher provision of Hospital Fact Sheets (59% versus 44%; $p = 0.03$), audiotape of consultations (57% versus 7%; $p = 0.0001$) information on clinical trials (40% versus 26%; $p = 0.003$) and study-participation (18% versus 10%; $p = 0.004$) in IG	NP	NP	IV	IV
10. Garvican et al., 1998[22] UK	• Comparative design • Satisfaction with clinical nurse specialist • Clinical Nurse Specialists versus general practitioners • No information on specialisation available	• $N = 119$ • Breast cancer patients in post-treatment phase	• Self-designed satisfaction questionnaires • Outcome: Satisfaction with care; results of fine-needle aspirations	Significant difference in satisfaction with specialised nursing care ($p = 0.0001$); no significant difference concerning fine-needle aspiration results of different professionals	NP	NP	IV	IV

IG = Intervention Group, CG = Control Group, NP = Not Possible, Specialised Nurses with formal accreditation highlighted in grey.

Only six of the articles complied with the inclusion criteria. Four additional articles were identified through snowball sampling.[12]

Search terms and results are summarised in Table 2.

2.1. Quality of trials under investigation

The randomised controlled trials (RCTs) included were critically analysed with respect to their research methods. The authors applied the catalogue of quality criteria for RCTs by Verhagen and colleagues [13] (definition of inclusion and exclusion criteria, the comparability of patients, double-blinding (examiner and patient) and the intention-to-treat analysis) with the exception of double blinding, which is inappropriate in the context of individualised care. Quality was classified on a numerical scale (1–9), with 9 being the highest quality level. Based on these considerations, the independent evaluation of the studies by two authors (ME and SM) resulted in a high degree of inter-rater agreement (Cohen's kappa = 0.67; $P = 0.004$). Evidence levels in the studies were classified by an existing and generally acknowledged evidence classification.[14] The agreement between the independent ratings by two authors was likewise high (Cohen's kappa = 0.53; P=0.01. Since the included trials employed different concepts of specialised nursing in breast cancer care, the studies were also analysed with respect to (a) nurses with formal accreditation of specialisation and (b) nurses with non-formal specialisation (cf. Table 3).

The outcomes of specialised nursing were classified in six inductively developed dimensions: improvements of physical impairment, psychosocial problems, patient satisfaction, decision making processes, collaboration in a multiprofessional team, and improvement of costs.

3. Results

The review systematically analysed a total of ten studies (cf. Table 3).

3.1. Role models of specialised nurses

Only a few studies give evidence of formal accreditation (such as higher education or university degrees) of the specialised nurses involved [15–17] (cf. highlighted columns, Table 3). All other studies are based on different role models of non-formal specialisation of nurses. The selected studies are based on different job titles such as Nurse Case Management,[18,19] Advanced Nurse Practitioner,[16,20] Nurse Specialist, Specialist Breast Nurses [15,17] or Breast Cancer Nurse.[21] Other studies focus on process aspects such as the continuity of care and care by nurses with working experience in the field of breast cancer care.[22–24] The studies differ with respect to the choice of intervention and control groups. Four studies compare specialised nursing performance with services provided by physicians and surgeons.[19,22,23] The remaining studies compare conventional care models with more innovative models offered by supplementary specialised nursing services. Further, the studies address different pathways of breast cancer patients based on different patient populations (cf. Table 3).

3.2. Outcomes of specialised nurse interventions

We have categorised the efficacy of interventions offered by specialised nurses into six dimensions of outcomes.

3.2.1. Improvement of physical impairment

Three studies investigate physical outcomes. In a randomised prospective trial with 335 patients aged 65 and older with newly diagnosed breast cancer, Goodwin and colleagues [18] reported a significant amelioration of arm functioning after axillary lymph node clearance in patients receiving nursing case management. In contrast, in a randomised controlled trial of 152 women with modified radical mastectomy and full axillary clearance, Maguire and colleagues[19] were not able to demonstrate any differences between patients receiving or not receiving specialised nurse counselling after surgery, except for a significant difference between counselling group and control for none versus some pain. In contrast, Watson and colleagues[17] did not find any differences in pain sensation between intervention and control groups in their randomised trial of 40 women with mastectomy for early stage breast cancer.

3.2.2. Improvement of psychosocial problems

Several studies suggest a positive effect of specialised nurse intervention on the duration and perceived intensity of psychosocial problems: In a randomised controlled trial with 152 patients with modified radical mastectomy and full axillary clearance, Maguire and colleagues[20] observed a significant improvement of anxiety and depression as well as shorter episodes of psychiatric morbidity in the intervention group counselled by specialised nurses. Similar evidence was provided by McArdle and colleagues[21] in a randomised controlled trial with 272 women undergoing surgery for breast cancer; they detected a significant reduction in psychological morbidity, anxiety and insomnia, social dysfunction and hospital depression in the group receiving counselling by a specialised nurse. Similarly, Watson and colleagues[17] found fewer depressed patients 3 months after the breast cancer operation in the group counselled by specialised nurses. Ritz and colleagues[16] described in their RCT a significant decrease of uncertainty in 210 women with newly diagnosed breast cancer receiving advanced nursing care. However, in a randomised trial with 264 patients, Koinberg and colleagues[23] could not confirm such effects with respect to reduction of anxiety and depression. Maguire and colleagues[20] also failed to show any positive effect on depression. McArdle and colleagues[21] as well as Maguire and colleagues in a later publication[19] described faster social reintegration, coping with the scar, the prosthesis, and breast loss as well as return to work as a result of specialised nursing. Further, Watson and colleagues found significant increases in vigour in the group counselled by a specialised nurse. In contrast, Wengström and colleagues[24] in a randomised trial with 134 women beginning adjuvant radiation therapy did not find significant differences in coping abilities between women receiving or not receiving specialised nursing care.

3.2.3. Improvement of patient satisfaction

In the multicentre case control study with 300 breast cancer patients Liebert and colleagues[15] reported that, from a retrospec-

tive point of view, patients indicated that specialised nurse counselling was an important decision criterion for hospital selection in the future. When comparing the service of physicians with that of specialised nurses in a sample of 119 breast cancer patients in the post-treatment phase, Garvican and colleagues[22] reported significantly higher patient satisfaction with the services of specialised nurses. In contrast the study by Koinberg and colleagues[23] revealed no significant differences between satisfaction with surgeons and specialised nurses in the domains of confirmation, trust and availability.

3.2.4. *Improvement of decision making processes*

Goodwin and colleagues[18] found higher confidence of having a voice in decision making, when counselled by a nurse case manager compared to counselling by a surgeon. They reported an increased proportion of patients opting for a breast conserving therapy and radiation therapy as well as significantly more frequent adjuvant radiation therapy and axillary dissection in this subpopulation. Breast reconstruction surgery was also more frequent in the subpopulation of patients with mastectomy, as was chemotherapy in patients with advanced disease.

Liebert and colleagues[15] reported that specialised nurse counselling resulted in a significantly higher rate of patients opting for plastic reconstruction.

3.2.5. *Improvement of collaboration in multiprofessional teams*

Maguire and colleagues[20] found a significantly better recognition of patients at risk for psychiatric morbidity and higher rate of referral to a psychiatrist related to the implementation of specialised nursing. Garvican and colleagues[22] found no difference between clinical nurse specialists and practitioners when comparing the quality of results of fine-needle-aspirations. Due to the implementation of specialised nurses in the multidisciplinary team, Liebert and colleagues[15] conclude a positive influence on continuity of care, information, patient support and efficiency of treatment-process.

3.2.6. *Improvement of costs*

Comparing conventional health care costs for breast cancer patients with the additional expenses induced by advanced nurse practitioners, Ritz and colleagues[16] did not find a significant difference in terms of charges and reimbursements between intervention and control groups.

4. Discussion

The present systematic literature review provides evidence that specialised nursing can contribute to improvement of a wide range of patient outcomes. With respect to *physical impairments* specialised nurses may contribute to improving arm-functioning after axillary lymph node clearance, but there is questionable evidence for improved pain prophylaxis. For *psycho-social impairments* the review suggests a reduction of psycho-social problems including anxiety and depression by specialised nursing. Further, specialised nursing may improve *patient satisfaction with the quality of care* and *patient involvement in the decision making processes*. However, these initial findings require confirmation by studies conducted under rigorous scientific standards to produce results with robust levels of evidence. To date, only one trial has examined the effect of specialised nurse interventions on *collaboration in multidisciplinary teams*.

The comparison of outcomes in assessments and diagnostic procedures between specialised nurses and other health professionals is rather new, but might be an aspect of further interest, as specialised nurses in the role of clinical nurse specialist or nurse practitioner may be in direct competition with the medical profession. Although *economic and financial considerations* impact dramatically on health care institutions and professionals, no conclusive results could be found with respect to specialised nurse interventions.

4.1. *Role models of specialised nursing*

The review provides evidence of the lack of a uniform role model of specialised nursing in breast cancer. Similar observations have been made in the current Advanced Nursing Practice debate.[25] We have found a wide variety of competence and educational levels for specialised nurses, ranging from basic education to clinical nurse specialists educated at university level, a wide variety of work domains, ranging from psycho-social support to somatic diagnostic and therapeutic interventions as well as different levels of autonomy.

As summarised in Table 3, there is in particular a lack of rigorous studies evaluating the effectiveness of *formally accredited* specialised nurses. Nevertheless, the role of specialised nurses in all cited studies can be summarised along four dimensions, developed by Hordern and colleagues:[8]

- to assess women's physical and psychosocial status in relation to treatment and to intervene appropriately
- to provide verbal and written information to women and their close others
- to coordinate the entire care episode across different treatment modalities
- to act as an integral part of the multidisciplinary team.

4.2. *Methodological considerations*

Despite the relatively small number of studies under investigation, there is a considerable divergence of outcome variables and instruments, which limits comparability. For instance, only anxiety and depression were measured with identical instruments and thus allow a meaningful comparison of results. Reliability and external validity of most instruments under investigation are questionable.

Further, a potential bias of contamination between intervention and control groups may be a limitation of all randomised studies in this review. A potential effect of specialised nurses on organisational culture has not been taken into account.

5. Conclusion

This review provides an orientation for the design and conceptualisation of new specialised nurse services for breast cancer patients as well as guidance for future research. Specialised nursing can contribute to an improvement in health and well-being of women with breast cancer, both on physical

and psycho-social levels. Its positive effect on a reduction of anxiety and depression as well as on an improvement of well-being finds the most robust empirical support to date. Nevertheless, and in order to develop a broader, more reliable basis for future services and research strategies, we postulate the need for a more specific definition of the role and required skills of specialised nurses in breast cancer care. Such standardisation is also necessary to make guidelines such as the one issued by EUSOMA[1] more meaningful and credible. Future investigations in the area of breast cancer care need to explore and define the degree of decision autonomy of specialised nurses and how such autonomy impacts on multidisciplinary teamwork, e.g. on physicians and on economic considerations, as they impact strategic decisions in health care.

An agreement on a more uniform role model of specialised nursing in breast cancer would facilitate the formulation and operationalisation of evaluative studies of this rather new service. A critical mass of high-quality studies is crucial for the development of such services in hospitals as well as for policy-making in national healthcare systems.

Conflict of interest statement

None declared.

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