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Review

Advanced breast cancer education for cancer nurses: A systematic review

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ABSTRACT

Background: Access to comprehensive, integrated, multidisciplinary care is one of the most urgent and actionable recommendations of the Advanced Breast Cancer Global Alliance. However, access to specialist breast care units, and specialist breast cancer nurses is variable, influenced by access to specialist education and role recognition. To date, there has not been a synthesis of evidence regarding educational programmes related to advanced breast cancer education for nurses.

Objectives: The aim of this review was to determine the content, mode of delivery, assessment and outcomes of education programmes related to advanced breast cancer for nurses.

Review methods: A systematic review was undertaken, according to the Joanna Briggs Institute's mixed methods review methodology.

Data sources: MEDLINE, PUBMED, CINAHL, Scopus, PsycInfo, Joanna Briggs Institute, Web of Science and grey literature sources were systematically searched. Eleven publications met the inclusion criteria. Data relating to programme content, mode of delivery, assessment and outcomes were extracted and analysed.

Results: This review identifies a limited number of educational programmes within this specialist area of nursing practice. Shortcomings in the development, implementation and evaluation of advanced breast cancer education programmes included limited use of educational standards, theoretical frameworks and patient and public involvement to inform programme development. Evaluation of education programmes related to advanced breast cancer relied predominantly on self-reported learning, with limited consideration of the impacts of education on service delivery, patient experience or quality of care.

Conclusions: Future development of advanced breast cancer education programmes must consider the alignment of programme content and learning outcomes with existing educational and competency standards. Evaluation of educational programmes in this field must endeavour to enhance rigour of methods, incorporating standardised questionnaires, and multiple methods and sources of data to evaluate the broader impacts of advanced breast cancer education for nurses.

1. Introduction

Breast cancer has surpassed lung cancer as the most commonly diagnosed cancer globally, with an estimated 2.3 million new cases (11.7 % of all cancers worldwide) (Sung et al., 2021). Between five and 10 % of people who are diagnosed with breast cancer, are initially diagnosed with advanced or metastatic disease; up to one-third of people diagnosed with early breast cancer may later develop advanced or metastatic disease (Cardoso et al., 2020; Harding et al., 2013; Hartmann et al., 2014). However, as a result of improving treatment modalities, the median survival of people diagnosed with advanced breast cancer is improving, with an almost two-fold increase in the 5-year relative survival rate for denovo metastatic breast cancer from 18 % to 36 % between 1992 and 2012 (Mariotto et al., 2017).

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Advanced breast cancer is associated with poorer self-reported quality of life outcomes and high symptom burden and unmet needs (Au et al., 2013; Ecclestone et al., 2016; Kadravello et al., 2021; Reed et al., 2012; Uchida et al., 2011). People living with advanced breast cancer require complex care, as well as effective coordination of all specialists involved (Au et al., 2013; Fallowfield et al., 2021; Reed et al., 2012). Several studies identify high levels of unmet need experienced by people living with advanced breast cancer related to understanding of their disease status, information related to their care, and strategies to self-manage disease- and treatment-related symptoms (Au et al., 2013; Fallowfield et al., 2021; Reed et al., 2012; Uchida et al., 2011).

People living with advanced breast cancer want access to treatments and access to experienced metastatic breast cancer nurses (Breast Cancer Now, 2019). However, just 55 % of 34 European countries have specialist breast cancer units with access to interdisciplinary care, which are often poorly distributed throughout each country, and variable standards of accreditation for these centres (Bochenek-Cibor et al., 2020). Where such services are not available, people may experience shortcomings in the integration of care, access to optimal treatments, and access to ancillary services that add much to quality of life such as specialist breast nurses, psycho-oncologists, patient support groups, and physiotherapists, among others (Cardoso et al., 2017).

Access to comprehensive, integrated, multidisciplinary care is one of the most urgent and actionable recommendation of the Advanced Breast Cancer Global Alliance (Cardoso et al., 2020; Paluch-Shimon et al., 2020). Access to a breast cancer nurse specialist is identified as a quality indicator for breast cancer care by the European Society of Breast Cancer Specialists (EUSOMA) (Biganzoli et al., 2017). Despite the need and recommendations for specialist breast cancer nursing care to address the complex needs of people living with advanced breast cancer (Biganzoli et al., 2017; Cardoso et al., 2020), fewer than one-third of people living with advanced breast cancer receive care from a specialist nurse in advanced breast cancer (Bochenek-Cibor et al., 2020; Breast Cancer Now, 2019). Even where countries have specialist breast units with multidisciplinary teams, many do not include a specialist cancer nurse (Biganzoli et al., 2017; Cardoso et al., 2017).

Specialist breast care nurse roles are developing in the Western world and in some European countries in particular (Eicher et al., 2012; Vila et al., 2017). Specialist breast cancer nurses are integral to the provision of high-quality care, and are associated with improved outcomes related to quality of life, anxiety and depression, and greater satisfaction with care (Brown et al., 2021). However, the inclusion of specialist and advanced breast cancer nursing roles in multidisciplinary teams is influenced by the variability in access to specialist cancer nurse education programmes, and role recognition throughout Europe (Charalambous et al., 2018; Kelly et al., 2020; Reed et al., 2010; Sharp et al., 2020). Cancer nurses providing care for people with advanced breast cancer require knowledge and skills that address their complex needs. While there are published educational standards and competencies for nursing related to advanced breast cancer (Breast Cancer Now, 2020; Vila et al., 2017), there has not been a synthesis of evidence regarding the availability, scope, and outcomes of educational programmes related to advanced breast cancer for nurses. Therefore, this review aims to:

1) determine the content and competencies of education programmes related to advanced breast cancer for nurses,
2) ascertain the modes of programme delivery and assessment utilised in existing advanced breast cancer education programmes for nurses, and
3) evaluate the outcomes of existing advanced breast cancer education programmes for nurses.

2. Methods

2.1. Systematic review

This systematic review was conducted according to the Joanna Briggs Institute's mixed methods review methodology (Pearson et al., 2015). Aligning with this approach, evidence derived from diverse methodological approaches were synthesized via a convergent integrated approach (Lizarondo et al., 2020; Pearson et al., 2015; Pearson et al., 2014). Throughout this review, key stakeholders with expertise in advanced breast cancer were consulted, including healthcare professionals, advocacy professionals and academics. A research librarian supported the development and execution of the search strategy.

2.2. Inclusion criteria

Studies were eligible for inclusion if they met the following criteria:

- *Participants:* nurses engaging in further education on breast cancer or advanced breast cancer, or educators who are delivering further education programmes on breast cancer or advanced breast cancer.
- *Intervention:* Postgraduate or continuing professional development programmes which provide education on advanced breast cancer as the primary topic, or as a sub-component of a breast cancer educational programme.
- *Outcomes:* Learning outcomes, topics and content of modules, modes of educational delivery, modes of assessment, and outcomes of educational programmes, based on Kirkpatrick's four levels, including:
  1) Reaction: students' experience, satisfaction and self-assessment of learning in advanced breast cancer.
  2) Learning: assessment grades and demonstration of skills in skills-based assessment.
  3) Behaviour: self-reported and observer-reported application of learning in clinical practice and impact on advanced breast cancer service development.
  4) Results: number of programme applicants, successful participants/graduates, alumni employment and promotional outcomes.
- *Studies:* Primary quantitative, qualitative or mixed-methods studies and systematic reviews evaluating the implementation and outcomes of educational programmes about advanced breast cancer. Peer-reviewed narrative reports describing the development of advanced breast cancer education programmes. Guidelines for breast cancer and advanced breast cancer education programmes.

2.3. Exclusion criteria

Studies or guidelines published in languages other than English were excluded from this review. Anecdotal reports and implementation or evaluation studies of breast cancer or advanced breast cancer education programmes that did not include nurses as a target audience or evaluation participant were also excluded.

2.4. Search and selection strategy

A comprehensive search strategy was designed based on the population (P), exposure (E), outcome (O) and study design (S) inclusion criteria to identify relevant peer-reviewed and grey literature. MEDLINE, PUBMED, CINAHL, Scopus, PsycInfo, Joanna Briggs Institute, Web of Science databases were searched from the date of inception to May 2021. Search terms included *breast cancer*, *advanced breast cancer*, *metastatic breast cancer*, *nurse education* and *nurse training programmes*. Searches were not restricted by language, but only studies published in English were selected for inclusion.

A Google advanced search was conducted in May 2021, using the

same search terms and inclusion/exclusion criteria to identify grey literature. This search yielded more than 18 million results; therefore, only the first 100 were scanned. The websites of key organisations in the fields of breast cancer, cancer nursing, surgical oncology, medical oncology and radiation oncology were hand searched to identify seminal grey literature for inclusion in the review, including guidelines for competence and education and training programmes in the fields of breast and advanced/metastatic breast cancer.

Endnote X9 was used to manage citations from multiple searches. Duplicate articles were removed using the automated 'remove duplicates' function in EndNote, and manual checks to ensure all duplicates were identified and removed. References were subsequently imported to Covidence for screening. Studies of interest to this review were identified through sequential evaluation of titles and abstracts against the PEOS criteria in Covidence. Full texts of articles retained following the title and abstract screening were subsequently retrieved and screened. Five authors were involved in the screening process (AD, GB, TW, MD, CDR). At each stage in the screening process, citations were screened by two researchers, and conflicts were resolved by an independent third reviewer.

2.5. Quality assessment

The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) appraisal tool was used to assess the methodological quality of selected primary studies, including the quality of reporting, validity and reliability of data collection and analysis methods, and the quality of study methods (Thomas et al., 2003). The quality of grey literature was evaluated using the Authority, Accuracy, Coverage, Objectivity, Date, Significance (AACODS) Checklist (Tyndall, 2008). Both tools were modified to include an additional item, specific to the purpose of this review, which evaluated the adequacy of the description of the content of the programme, curriculum or standards. Quality criteria were evaluated by two independent reviewers (AD, GB). Studies were not excluded from the review based on their quality.

2.6. Data extraction and analysis

Data was extracted from included full texts, based on the aim of the review, using a project-specific data extraction tool. Five authors were involved in the data extraction process (AD, GB, TW, MD, CDR). Two reviewers independently extracted data from included reviews, these were compared and verified by a third independent reviewer. Data extracted from each report included the publication year, country, study and/or programme aim, programme description, target audience, mode of delivery, mode of assessment, setting, data collection methods, and programme outcomes, guided by Kirkpatrick's four levels of learning; students' experience, satisfaction, self-assessment of learning and programme results. Aligning with the convergent integrated approach to mixed methods evidence synthesis, quantitative data were transformed to textual descriptions, enabling integration of quantitative, qualitative and mixed methods data in an integrated synthesis (Lizarondo et al., 2020).

3. Results

3.1. Characteristics of the studies

The search resulted in 918 citations, of which nine peer-reviewed articles and two grey literature reports were included (Fig. 1). Peer-reviewed articles reported breast or advanced breast cancer educational programmes in Australia ($n = 4$), the United States ($n = 3$), Japan ($n = 1$) and Spain ($n = 1$). Grey literature reports were both from the United Kingdom ($n = 2$). Peer-reviewed articles were published between 2005 and 2019, of which 4 (44.4 %) were published since 2015.

Included documents focused on the development ($n = 3$; Table 1) (Larson et al., 2019; Trovato et al., 2013; Turner et al., 2008) or evaluation ($n = 5$; Table 2) (Iseki et al., 2018; Steginga et al., 2005; Trovato

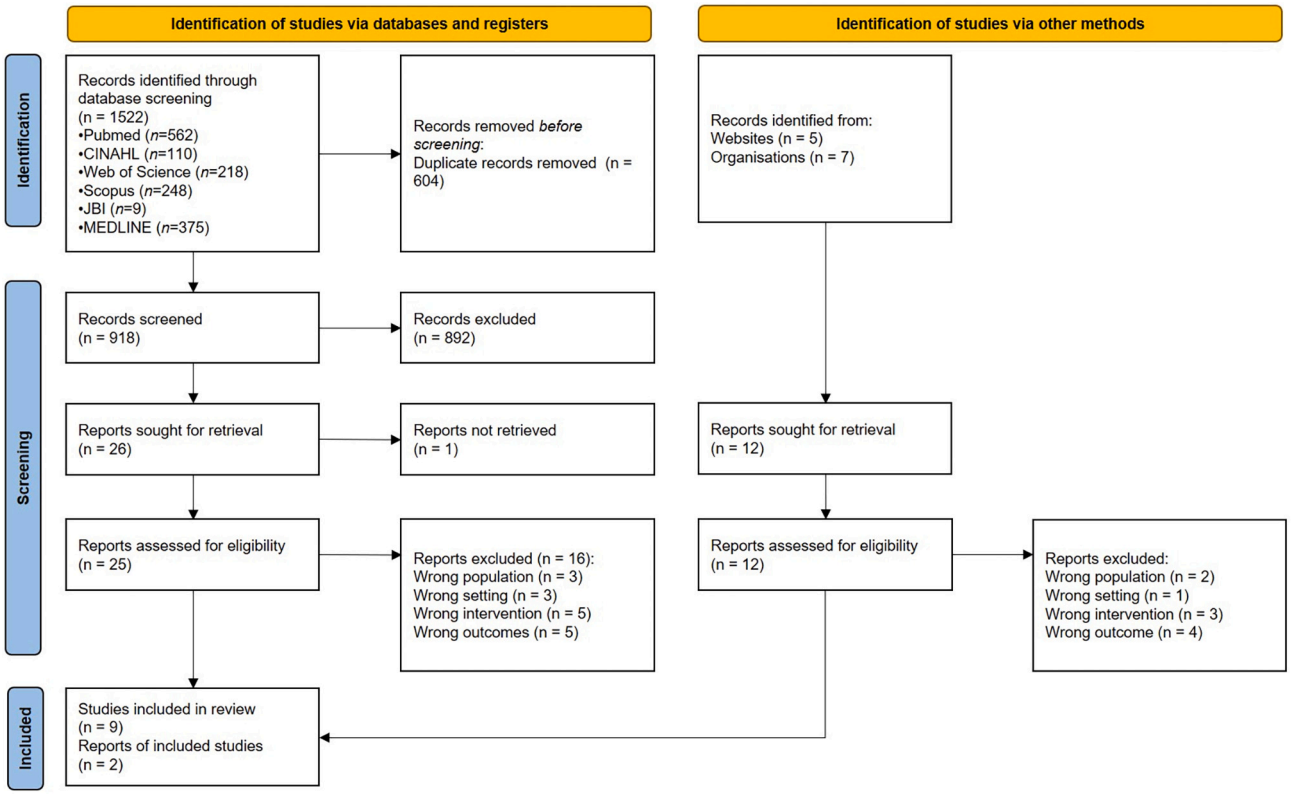


Fig. 1. PRISMA flow diagram.

Table 1
Characteristics of reports describing the development of education programmes related to advanced breast cancer.

Author, year, country	Aim	Design methods	Programme characteristics
Larson et al. (2019), USA	To understand the challenges of multidisciplinary teamwork to inform the creation of a cross-discipline retreat-training program for oncology care providers.	*Design:* Qualitative. *Sample size:* $n = 5$. *Data collection methods:* Semi-structured interviews.	*Target audience:* Multidisciplinary cancer care professionals working in advanced breast cancer. *Advanced breast cancer focus:* Programme aimed to prepare multidisciplinary healthcare professionals to deliver a 3-day therapeutic retreat for women with metastatic breast cancer. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Teaching methods:* Pre-retreat: programme delivery methods not described. During and after the retreat: reflective practice, debriefing. *Topics/competencies:* Facilitating group discussion of sensitive topics; support emotional awareness within group dynamics; delegation of leadership roles in multidisciplinary teams; handling challenging situations, including conflict and withdrawal.
Trovato et al. (2013), USA	To describe the development process of an interprofessional web-based breast cancer education modules for integration into graduate and undergraduate programmes in nursing, pharmacy and social work.	*Design:* Narrative. *Sample size:* Not reported. *Data collection methods:* Expert consultation.	*Target audience:* Graduate and undergraduate nursing, pharmacy and social work students. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic. Breast cancer was the primary topic of the programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Teaching methods:* Online: Short written paragraphs or bullets and visual objects. *Topics/competencies:* Epidemiology of breast cancer; breast cancer risk; screening for breast cancer; diagnosis, staging and grading; treatment modalities for breast cancer; breast cancer disparities; metastatic breast cancer.
Turner et al. (2008), Australia	To describe the development and content of an education manual which provides clinically relevant information and evidence-based recommendations to guide supportive care.	*Design:* Mixed methods. *Sample size:* Not applicable. *Data collection methods:* Literature review; qualitative consultation; expert advisory panel.	*Target audience:* Oncology nurses. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic; communication and support for parents with advanced cancer were the primary topics of this programme. *PPI involvement:* Not reported. *Curriculum model:* Kaufman ABC of learning and teaching in medicine. *Teaching methods:* Education manual, incorporating problem-solving exercises, self-reflective exercises and self-directed reading about practical approaches to communication with parents with advanced cancer. *Topics/competencies:* Emotional dimensions of advanced cancer; the needs of children of parents with cancer; psychosocial adjustment of parents with advanced cancer.

et al., 2013; Turner et al., 2009; Wang et al., 2015) of an education or training programme for healthcare professionals, including nurses, related to advanced breast cancer. Four described educational standards and competencies for nurses concerning breast cancer (Table 3) (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007).

Overall, the quality of primary studies evaluated via the EPPI-centre criteria was variable; five of nine studies achieved 11 or more of the 13 criteria (Table 4). The remaining studies achieved between five and seven of the EPPI-centre criteria. Both grey literature items evaluated using the AACODS criteria were of high quality, with both achieving six and seven of seven quality criteria (Table 5).

3.2. Processes of developing healthcare professional education programmes, standards and competencies related to advanced breast cancer

Of the papers which described the development of education programmes or curricula related to advanced breast cancer (Table 1; Table 3), five of the seven documents described the programme development process ($n = 5$) (Larson et al., 2019; Trovato et al., 2013; Turner et al., 2008; Vila et al., 2017; Yates et al., 2007). Programme development was informed by guidance from an expert curriculum advisory panel ($n = 3$) (Trovato et al., 2013; Turner et al., 2008; Vila et al., 2017; Yates et al., 2007), literature review ($n = 2$) (Turner et al., 2008; Vila et al., 2017; Yates et al., 2007), review of competency standards and existing education programmes ($n = 1$) (Yates et al., 2007), qualitative consultation ($n = 2$) (Larson et al., 2019; Turner et al., 2008) and Delphi consensus ($n = 1$) (Vila et al., 2017). Three of the five studies used multiple methods to inform programme development (Turner et al., 2008; Vila et al., 2017; Yates et al., 2007). Two of the papers (Iseki et al., 2018; Larson et al., 2019) involved nurses (participants) in the development of the respective education programme. None of the included papers described the involvement of people living with advanced breast cancer in the curriculum development process. One paper described an educational theory underpinning the development of programme content (Turner et al., 2008).

Of papers which focused only on the evaluation of healthcare professional education programmes related to advanced breast cancer ($n = 4$), one reported the programme was developed with guidance from an expert curriculum advisory panel (Iseki et al., 2018). Neither of the competency standards identified in the grey literature search described the process of development (Breast Cancer Now, 2020; Royal College of Nursing, 2019).

Table 2
Characteristics of reports describing the evaluation of education programmes related to advanced breast cancer.

Author, year, country	Aim	Evaluation methods	Programme characteristics	Evaluation results/outcomes
Iseki et al. (2018), Japan	To investigate the learning effect of a webinar-delivered programme for nurses, focusing on treatment and nursing care for metastatic breast cancer.	*Design:* Pre-post pilot. *Sample size:* 85 (11 %). *Data collection methods:* Not described.	*Target audience:* Nurses with more than 3 years' experience caring for women with breast cancer. *Advanced breast cancer focus:* Advanced breast cancer was the primary topic of the programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Programme development methods:* Expert advisory panel consulted. *Teaching methods:* Webinar: 13 chapters containing lectures & case studies of 15 to 20 minutes length. *Topics/ competencies:* Pathophysiology and treatment of metastatic breast cancer; special considerations for care of people living with metastatic breast cancer, breast ulceration, bone metastasis, severe pain.	*Reaction:* Not reported. *Learning:* Overall improvement in nurses' knowledge between the start and end of the programme identified; meaning/significance of change not reported. Treatment of metastatic breast cancer (54 % change), nursing care of hereditary breast and ovarian cancer (40 % change) and medications of metastatic breast cancer (34 % change) were identified as the most effective chapters. Several chapters had low rates of change (7 %). *Behaviour:* Not reported. *Results:* 771 programme applicants. Number of successful applicants/graduates not reported.
Trovato et al. (2013), USA	To describe the development of interprofessional web-based breast cancer education modules for integration into graduate and undergraduate programmes in nursing, pharmacy and social work.	*Design:* Audit. *Sample size:* 1467 undergraduate nursing students, 240 Master of Social Work students, 156 Doctor of Pharmacy students. *Data collection methods:* Multiple choice exam questions and case-based short answer question.	*Target audience:* Graduate and undergraduate nursing, pharmacy and social work students. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic. Breast cancer was the primary topic of the programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Teaching methods:* Online: Short written paragraphs or bullets and visual objects. *Topics/ competencies:* Epidemiology of breast cancer; breast cancer risk; screening for	*Reaction:* Not reported. *Learning:* Doctor of Pharmacy students: 66 % correctly responded to post-test questions on first attempt. Results of case-based short answer question not reported. Nursing Students: Outcomes not reported. Social Work Students: No formal assessment completed. *Behaviour:* Not reported. *Results:* Not reported.

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Table 2 (*continued*)

Author, year, country	Aim	Evaluation methods	Programme characteristics	Evaluation results/outcomes
			breast cancer; diagnosis, staging and grading; treatment modalities for breast cancer; breast cancer disparities; metastatic breast cancer.	
Turner et al. (2009), Australia	To enhance oncology nurses' capacity to provide supportive care to patients with advanced cancer who have dependent children.	*Design:* Pre-test, post-test. *Sample size:* 35 (25 %). *Data collection methods:* Questionnaire: burnout, health, stress, confidence and attitudes. Assessment: essay and simulated patient interviews.	*Target audience:* Oncology nurses. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic; communication and support for parents with advanced cancer were the primary topics of this programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Programme development methods:* Not reported. *Teaching methods:* Self-directed learning manual and 1-day communication skills training workshop. *Topics/ competencies:* Overview of evidence about communication in oncology, with special reference to parents with advanced cancer.	*Reaction:* Participants reported the educational manual was easy to use (82 %) and relevant (88 %). Reflective (71 %) and problem-solving exercises (65 %) were helpful, and participants felt supported during workshops (82 %). *Learning:* Nurses reported actively caring for themselves emotionally and spiritually. Participants reported increases in confidence about ability to provide support and information, and raise discussion about emotional issues with parents. Participants felt more confident in their ability to help the parent, and the nurses did not have to focus on practical issues or recommend referral as occurred at T1. *Behaviour:* 65 % of participants believed the training programme had enhanced their clinical work. Significant improvements in general communication skills and skills specific to this training were identified. *Results:* 35 programme applicants. 32 completed the programme successfully.
Steginga et al. (2005), Australia	To evaluate the impact of a cancer nursing education programme on: 1) nurses' knowledge about cancer and its treatment; 2) attitudes and perceived skills in psychosocial care of people living with cancer and their families; and 3) preparedness for nursing in cancer care.	*Design:* Quasi-experimental pre-test, post-test design. *Sample size:* Intervention Group: $n = 31$; Control Group: $n = 22$. *Data collection methods:* Quiz; questionnaire.	*Target audience:* Registered nurses. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic; chemotherapy, breast cancer, palliative care, and introduction to cancer nursing were the primary topics of this programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Programme development methods:* Not reported. *Teaching methods:* Residential programme: clinical visits;	*Reaction:* Participants reported high levels of satisfaction, improvements in knowledge and confidence in cancer nursing practice, and increased activity in patient education and referral to community support services. *Learning:* Not reported. *Behaviour:* Participants reported: 1) feeling more confident and willing to discuss patient care with peers; 2) being more willing to discuss psychosocial concerns with patients and family members; 3) their communication with physicians had improved since attending the course; 4) incorporating evidence-based practice; and 5) improved professional networks with nurses from other, larger treatment centres. *Results:* 31 nurses agreed to participate in the programme; 30 completed the second assessment; 24 completed the third and final assessment (80 %).

(*continued on next page*)

Table 2 (*continued*)

Author, year, country	Aim	Evaluation methods	Programme characteristics	Evaluation results/outcomes
			interactive and didactic learning sessions; problem-based learning; reflective practice. *Topics/ competencies:* The palliative care and breast cancer courses focus totalled 31 h of educational content, of which about 60 % of each curriculum covers disease and treatment, 30 % addresses psychosocial care, and 10 % addresses professional development and support.	
Wang et al. (2015), USA	To determine whether a brief, targeted sexual health training for oncology providers results in improved provider comfort level and frequency of addressing female cancer-related sexual issues.	*Design:* Pre-test, post-test design. *Sample size:* Pre-test: 71 oncology professionals; post-test: 36 oncology professionals. *Data collection methods:* Self-report questionnaire.	*Target audience:* Oncology professionals: Oncologists, surgeons and nursing and allied health professionals. *Advanced breast cancer focus:* Advanced breast cancer was a secondary topic. Breast cancer and female sexual health was the focus of this programme. *PPI involvement:* Not reported. *Curriculum model:* Not reported. *Programme development methods:* Not reported. *Teaching methods:* Face to Face: 30–45 minute presentation, including case vignettes and role play. *Topics/ competencies:* Definition of sexual health; normal female sexual response cycles, effects of menopause and aging; sexual side effects of breast cancer and treatment, including biological, psychosocial and relational effects; prevalence and long-term nature	*Reaction:* The majority of participants reported lecture content was useful, relevant to practice and enhanced knowledge and skills related to sexual health issues. *Learning:* There were statistically significant increases in participants' comfort levels and frequency of addressing cancer-related sexual health issues. *Behaviour:* The majority of participants reported that they gained new strategies and skills which could be applied to their area of practice. *Results:* Number of professionals who took part in the programme not reported. 71 oncology professionals completed pre-test survey; 36 completed post-test survey.

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Table 2 (*continued*)

Author, year, country	Aim	Evaluation methods	Programme characteristics	Evaluation results/outcomes
			of female cancer-related sexual issues; recent DSM revisions for Female Sexual Dysfunction; definition of couples sexual health; current recommendations for providing cancer-related sexual health care; national and local cancer-related sexual health resources/ referrals; case vignettes on common female cancer-related sexual health issues: vaginal dryness, low desire, and relationship discord; role play of a sexual health assessment tool: "Did you CARD her?"; cancer team's role in addressing sexual health; evaluation and treatment.	

3.3. Nurse education standards and competencies related to advanced breast cancer

Two of the standards for nurse education and competencies which were included in this review focused on the primary topic of advanced breast cancer (Table 3) (Breast Cancer Now, 2020; Vila et al., 2017). The two remaining standards documents focused on breast cancer specifically, and included recommendations related to advanced breast cancer (Royal College of Nursing, 2019; Yates et al., 2007). These documents made broad recommendations for nurse education related to advanced breast cancer to include content related to:

- The background and significance of advanced breast cancer (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017),
- Treatment for advanced breast cancer (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017),
- Supportive, palliative and end of life-care (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007),
- Communication skills, cultural awareness, emotional awareness and advocacy skills (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007),
- Multidisciplinary/Interdisciplinary approaches to care (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007),
- Clinical leadership (Vila et al., 2017; Yates et al., 2007), and
- Self-care (Breast Cancer Now, 2020; Vila et al., 2017).

One document recommended that education programmes related to advanced breast cancer should be presented in a face-to-face format, based on the consensus opinion of experts in oncology nursing and medical oncology (Vila et al., 2017).

3.4. Characteristics of healthcare professional education programmes related to advanced breast cancer

Seven studies describing the development or evaluation of six education programmes related to advanced breast cancer were included in this study. Of these, two programmes had a primary focus on advanced breast cancer (Iseki et al., 2018; Larson et al., 2019). Two programmes focused on breast cancer, but included components on advanced breast cancer (Steginga et al., 2005; Trovato et al., 2013). Two education and training programmes were designed to enhance the provision of supportive care to people with advanced cancer, including advanced breast cancer (Turner et al., 2009; Turner et al., 2008; Wang et al., 2015).

Education programmes were designed for nurses (Iseki et al., 2018) or multidisciplinary professionals (Larson et al., 2019) working in the area of breast cancer, while remaining programmes were designed for cancer nurses (Turner et al., 2009; Turner et al., 2008), cancer care professionals (Wang et al., 2015), general nurses (Steginga et al., 2005) and graduate and undergraduate students from multidisciplinary fields (Trovato et al., 2013).

The mode of programme delivery included workshops (Turner et al., 2009; Turner et al., 2008; Wang et al., 2015), a residential programme (Steginga et al., 2005), online webinars (Iseki et al., 2018) or workbooks (Trovato et al., 2013; Turner et al., 2009; Turner et al., 2008). One study did not describe the mode of programme delivery.

Considering the recommendations for content of education programmes related to advanced breast cancer (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007), few programmes consistently aligned with these recommendations. For example, three of the six reviewed programmes included content on the background and significance of advanced breast cancer (Iseki et al., 2018; Steginga et al., 2005; Trovato et al., 2013), three included content regarding the treatment of advanced breast cancer (Iseki et al., 2018;

Table 3
Characteristics of nurse education standards and competencies.

Author, year, country	Aim	Design methods	Target audience	Advanced breast cancer focus:	PPI involvement	Curriculum model	Topics/competencies
Yates et al. (2007) Australia	To define a set of competency standards and recommendations for the education and training of specialist breast nurses in Australia.	Mixed methods: literature review; stakeholder consultation; synthesis of competency standards and educational requirements; review of education programmes.	Specialist breast cancer nurses	Advanced breast cancer was a secondary topic. Specialist breast cancer nurse competencies and educational standards were the focus of this document.	Not reported	Not reported	Supportive care; collaborative care; coordinated care; information provision and education; clinical leadership.
Royal College of Nursing (2019), UK	The competency framework for nurses providing care to people with breast cancer identifies the breast cancer specific knowledge and skills nurses require to provide care to people affected by breast cancer in general and specialist settings.	Not reported	Oncology nurses	Advanced breast cancer was a secondary topic within this breast cancer competency framework.	Not reported	Not reported	Anatomy, physiology, prevalence & epidemiology; psychological care; communication; consent; holistic needs assessment; multidisciplinary team working & interdisciplinary/ interagency working; clinical trials & application of research; screening & health promotion; diagnosis; breast surgery; breast & nipple reconstruction; lymphoedema; systemic anti-cancer treatments and supportive medications; radiotherapy; follow-up; secondary breast cancer; palliative care and end of life care; leadership.
Vila et al. (2017), Spain	To define a new oncology nursing role specialising in advanced breast cancer, to help guide patients throughout the whole healthcare itinerary.	Mixed methods: systematic review, Delphi and participatory meeting with expert advisory panel.	Oncology nurses	Oncology nursing roles in advanced breast cancer is the focus of recommendations of this document.	Not reported	Not reported	Patient assessment; clinical management; counselling/ coaching; psychological considerations; healthcare education and coaching for patients and families; symptoms management, including pain and anxiety.
Breast Cancer Now (2020), UK	To support the provision of care and support for people with secondary breast cancer.	Not reported	Specialist breast cancer nurses	Advanced breast cancer is the primary focus of these standards of care.	Yes	Not reported	Advanced assessment skills; advocacy skills; case-management and coordination; communication with family members, including children; current clinical research and trials; health education; local and national support services for metastatic breast cancer patients; advanced breast cancer, treatment and the illness trajectory; national and local information and support for patients' families; supported decision-making; supportive care; self-management support; palliative care; end of life care; psychosocial, spiritual/existential impact of metastatic breast cancer on the patient and their family; self-care.

Trovato et al., 2013; Turner et al., 2009; Turner et al., 2008), four described content focusing on various aspects of supportive, palliative and end of life-care (Larson et al., 2019; Steginga et al., 2005; Trovato et al., 2013; Wang et al., 2015), three included content related to communication skills, cultural awareness, emotional awareness and advocacy skills (Larson et al., 2019; Steginga et al., 2005; Turner et al., 2009; Turner et al., 2008). One study included guidance on multidisciplinary approaches to care (Larson et al., 2019), two provided education

Table 4
Summary results of the EPPI-Centre quality assessment.

Author, year, country Quality criteria	Iseki et al. (2018), Japan	Larson et al. (2019), USA	Steginga et al. (2005), Australia	Trovato et al. (2013), USA	Turner et al. (2008), Australia	Turner et al. (2009), Australia	Vila et al. (2017), Spain	Wang et al. (2015), USA	Yates et al. (2007) Australia
A = Aims and objectives clearly reported	Y	Y	Y	Y	Y	Y	Y	Y	Y
B = Adequately described the context of the research	Y	Y	Y	Y	Y	Y	Y	Y	Y
C = Adequately described the sample and sampling methods	Y	Y	Y	Y	Y	Y	Y	Y	Y
D = Adequately described the data collection methods	N	Y	Y	Y	Y	Y	Y	Y	Y
E = Adequately described the data analysis methods	Y	Y	Y	N	N	Y	Y	Y	Y
F = Good or some attempt to establish the reliability of the data collection tools	N	N	Y	N	N	Y	N	N	N
G = Good or some attempt to establish the validity of the data collection tools	N	Y	Y	N	Y	Y	Y	Y	N
H = Good or some attempt to establish the reliability of the data analysis	N	Y	Y	N	N	Y	Y	Y	N
I = Good or some attempt to establish the validity of the data analysis	N	Y	Y	N	N	Y	Y	Y	N
J = Used the appropriate data collection methods to allow for expression of views	Y	Y	Y	N	Y	Y	Y	Y	Y
K = Used the appropriate methods for ensuring the analysis was grounded in the views	Y	Y	Y	N	N	Y	Y	Y	N
L = Actively involved the participants in the design and conduct of the study	Y	Y	N	N	N	N	N	N	N
M = Adequately described the content of programme/ curriculum	N	Y	N	Y	Y	Y	Y	Y	Y
Number of EPPI-Centre Criteria Met	**7**	**12**	**11**	**5**	**7**	**12**	**11**	**11**	**7**

Table 5
Summary results of the AACODS quality assessment.

	Authority	Accuracy	Coverage	Objectivity	Date	Significance	Describes curriculum content	Number of AACODS criteria met
Breast Cancer Now (2020), UK	Y	Y	Y	Y	N	Y	Y	**6**
Royal College of Nursing (2019), UK	Y	Y	Y	Y	Y	Y	Y	**7**

on self-care for cancer nurses (Larson et al., 2019; Turner et al., 2009; Turner et al., 2008). None of the included programmes described curriculum related to clinical leadership.

3.5. Evaluation of healthcare professional education programmes related to advanced breast cancer

Of the five papers which described the evaluation of education programmes (Table 2), three used pre- and post-programme evaluation methods, two of which used quasi-experimental methods. One audited the end-of-programme assessment results. Studies which conducted pre-post evaluations of programmes included samples of between 31 and 156 participants.

Collectively, the programme evaluations reported findings for each of the four of the Kirkpatrick levels of evaluation, however, none of the programmes included evaluation of all four levels. Two studies evaluated students' reaction to the educational programme, including self-reported satisfaction with the programme (Steginga et al., 2005; Turner et al., 2009) and the accessibility of programme content (Turner et al., 2009). Three of the five studies evaluated students' perceptions of their knowledge (Iseki et al., 2018; Steginga et al., 2005; Wang et al., 2015); one study reported the academic outcomes of a component of the assessment for one of the three cohorts of students described in the study sample (Trovato et al., 2013). Three studies evaluated students' self-perceived changes in behaviour, including levels of confidence in providing care (Steginga et al., 2005; Turner et al., 2009; Wang et al., 2015), providing information and education (Steginga et al., 2005; Turner et al., 2009) and referring people living with advanced breast cancer to community support services (Steginga et al., 2005). Four studies reported the results of the programme, including the number of programme applicants (Iseki et al., 2018; Steginga et al., 2005; Turner et al., 2009) and number of successful graduates (Steginga et al., 2005; Turner et al., 2009).

Of studies which described evaluation outcomes related to students' reaction to learning, all suggested students were satisfied with programmes, highlighting the usefulness of the knowledge acquired and its

relevance to practice (Steginga et al., 2005; Turner et al., 2009; Wang et al., 2015). Subjective self-evaluations of learning highlighted self-perceived improvements of knowledge and confidence in practice (Larson et al., 2019; Steginga et al., 2005; Wang et al., 2015). While studies which evaluated objective assessment of learning reported improvements in knowledge, the significance of improvements was unclear, with inconsistencies in achievement of learning outcomes across modules (Iseki et al., 2018). Furthermore, the specific outcomes of learning was not consistently reported for cohorts who undertook the education programme reported by Trovato et al. (2013), representing a significant limitation of this study.

While four evaluation studies described Level 3 and Level 4 outcomes for the Kirkpatrick framework, these were predominantly self-reported by participants. In particular, changes in behaviour were focused on confidence or perceived likelihood of engaging in nursing care of people living with advanced breast cancer, with results suggesting positive outcomes for students, which had the potential to impact patient care (Steginga et al., 2005; Turner et al., 2009; Wang et al., 2015). For level four outcomes, all focused on the number of students who enrolled and/or completed the programme (Iseki et al., 2018; Steginga et al., 2005; Turner et al., 2009). However, these outcomes were not consistently reported, and the number of students who enrolled (Wang et al., 2015) or completed programmes (Iseki et al., 2018) in some studies was unclear. Where pre-test and post-test assessments were reported, attrition in these programmes was 49.3 % (Wang et al., 2015), 22.6 % (Steginga et al., 2005) and 8.6 % respectively (Turner et al., 2009).

4. Discussion

This review aimed to determine the content and competencies of education programmes, ascertain the modes of programme delivery and assessment utilised in existing education programmes, and synthesize evidence concerning the outcomes of existing education programmes related to advanced breast cancer for nurses. The quality of evidence underpinning this review was variable, and included a number of high-quality studies and standards for education. However, four of the eleven documents included in this review were of moderate quality. Furthermore, this review highlights several key limitations in the development, implementation and evaluation of education programmes for cancer nurses to advance knowledge and competence related to the care of people living with advanced breast cancer.

Most critically, this review has identified a limited number of educational programmes which provide nurse education about advanced breast cancer care. These are further limited by the use of face-to-face models of delivery, which feeds into the geographical inequities in access to education for cancer nurses. Access to specialist clinical education in cancer care is critical to the development of specialist and advanced practice roles in nursing, and is an identified barrier to role enhancement (Kelly et al., 2020). Relevant and accessible education is essential to ensure the cancer nursing workforce is equipped to respond to recommendations for specialist breast cancer nursing care to address the complex needs of people living with advanced breast cancer (Biganzoli et al., 2017; Cardoso et al., 2020).

Regarding the development of educational programmes, few articles described a specific curriculum development model or framework which informed the development of the programme (Turner et al., 2008). The programmes reported in papers included within this review offer limited description of content related to advanced breast cancer, particularly for programmes which have a wider focus on breast cancer care. Of papers which described the content of education programmes related to advanced breast cancer, none consistently aligned with published recommendations for competencies and educational standards for advanced breast cancer education (Breast Cancer Now, 2020; Royal College of Nursing, 2019; Vila et al., 2017; Yates et al., 2007). While adopting a one-size-fits all approach to the development and implementation of educational programmes is not pragmatic and may propagate barriers to specialist nurse education, transparent reporting of the frameworks which underpin such programmes can support systematic approaches to programme development which allow flexible adaptation of programmes to respond to local needs (Viennet and Pont, 2017).

Patient and public involvement (PPI) in education of healthcare professionals is increasingly being recognised as good practice, sensitising educators and healthcare professionals to the specific needs of people living with and after cancer (Suikkala et al., 2018; Towle et al., 2016; Wykurz and Kelly, 2002). In each of the programmes included in this review, none explicitly indicated the involvement of people living with or after advanced breast cancer in the development or delivery of the educational programme. Where meaningful patient and public involvement is achieved in the development and delivery of health professional education programmes, patient representatives valued the opportunity to facilitate students' learning and understanding of their care, wellbeing, and opportunities to be actively involved in student assessment and feedback processes (Suikkala et al., 2018). Of course, specialist knowledge and skills are required to ensure high-quality care for people affected by advanced breast cancer. However, it is essential that specialist cancer nurses understand the needs and preferences of people living with advanced breast cancer to ensure that care is tailored to meet the complexity of their needs (Au et al., 2013; Ecclestone et al., 2016; Kadravello et al., 2021; Mayo et al., 2021; Reed et al., 2012; Uchida et al., 2011). Patient involvement in nurse education programmes can enrich students' learning, enable the delivery of care that is responsive to the individual needs, preferences and values of people living with advanced breast cancer (Suikkala et al., 2018).

The results of this review suggest that published evaluations of education programmes related to advanced breast cancer provide evidence for each of the four levels of the Kirkpatrick framework; reaction, learning, behaviour and results. However, programme evaluations included within this review included relatively small samples, and programme evaluations at all levels of the Kirkpatrick framework relied predominantly on participants' self-reported experience, using study-specific questionnaires to evaluate changes in attitude, knowledge, skills and behaviours. Furthermore, there remains a limited understanding of the organisational and systemic impacts of advanced breast cancer education programmes, including the impacts on service delivery, patient outcomes and patient experiences. The tendency to evaluate educational programmes at lower levels of the Kirkpatrick model and challenges of rigorously evaluating impacts of education at individual, organisational and contextual levels are recognised limitations of the Kirkpatrick framework (Bates, 2004; Cahapay, 2021). While self-perceived learning is a relevant indicator for programme evaluation, objective evaluation of students' achievement of learning outcomes and the wider impact of educational programmes on service delivery is essential to ensure that such programmes are meaningfully impacting care. Therefore, where resources permit, future evaluations of advanced breast cancer education programmes must endeavour to consider the specific impacts of such programmes on patient experience and quality of care.

Limitations of this review include the inclusion of empirical and grey literature published only in the English language. This may result in the exclusion of potentially relevant programmes and education standards published in other languages. Nevertheless, the use of a systematic review methodology enables synthesis of the breadth of educational programmes for nurses related to advanced breast cancer, and enables understanding of the gaps in content and availability which may hinder access to specialist education in this field.

5. Conclusion

This review sought to determine the content, mode of delivery, assessment and outcomes of education programmes related to advanced

breast cancer. This review identifies a limited number of educational programmes within this specialist area of cancer nursing practice, and furthermore identifies shortcomings in the development, implementation and evaluation of education programmes. These findings have several implications for clinical practice and professional education related to advanced breast cancer care. The development of advanced breast cancer education programmes requires greater transparency in the reporting of programme content, and the clinical and/or educational standards which have informed programme development are needed. To ensure that the content and learning outcomes of such programmes are tailored to address the needs of people affected by advanced breast cancer, greater patient and public involvement in curriculum development is required. Finally, future efforts to evaluate education programmes in advanced breast cancer require greater rigour, incorporating standardised evaluation tools, and consideration of the specific impacts of such programmes on healthcare delivery, patient experience and quality of care.

Data availability

The datasets generated during and/or analysed during the current study are available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

All authors (AD, MD, CDR, SE, VA, TW, GB) contributed to the concept and design of this study. AD and GB prepared the review protocol. AD, MD, CDR, TW, GB engaged in data curation. All authors (AD, MD, CDR, SE, VA, TW, GB) were involved in interpretation of the data. AD prepared the initial draft of the manuscript and all authors (AD, MD, CDR, SE, VA, TW, GB) critically reviewed and approved the paper. AD & GB are guarantors.

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Declaration of competing interest

The authors declare no conflict of interest.

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