

Introduction

Rising breast cancer disease incidence and an overall ageing population in the United Kingdom (UK) means that more women (and men) are being diagnosed with breast cancer, alongside this more people are surviving and living longer following a breast cancer diagnosis^{1,2}.

Members of the public accessing cancer screening services and patients, along with their families and carers, with concerning symptoms referred for diagnostic investigations expect breast services to be of a high standard, accessible, accurate and compassionate^{3,4}. Expectation, increasing demand against a backdrop of workforce shortage, compromises the ability of the National Health Service (NHS) to maintain the level of quality required to inspire confidence, offer timely reassurance when all is well, and expedite treatment when required⁵. Demand on the breast diagnostic workforce, to provide initial and ongoing care, is therefore predicted to continue to rise for the foreseeable future⁶.

Advanced practice has long been used in breast screening and symptomatic services to meet these demands, with many senior radiographers upskilled into advanced and consultant practitioner level roles where they undertake image interpretation, ultrasound, tissue sampling and pre-operative localisation procedures with advanced practice first piloted in breast imaging in 1999-2001 by the Department of Health (DoH) through a four-tier system^{7,8,9}. The four-tier system defines multidisciplinary practice not by profession but by skills and competences across traditional boundaries, promoting new and extended roles through advanced practice, widening routes of access to advanced practice and develops the potential of all clinical practitioners⁸. The aim of advanced practice through the four-tier system was to develop a workforce that could expand cancer services in light of critical radiographer, radiologist and oncologist shortages¹⁰.

Workforce shortages have not only persisted but worsened in recent years^{11,12}, leading to increased efforts to support advanced practice. For example, the National Health Service (NHS) has recently released the Long-Term Plan for improved early diagnosis of (breast) cancer which offers further opportunities for advanced practice¹³. Additionally, Health Education England recently implemented an

Advanced Clinical Practitioner apprenticeship training programme to further facilitate progression and development of experienced healthcare professionals¹⁴. For example, senior radiographers are ideally placed to benefit from this programme and develop further expertise and skills to enable them to take more responsibility for the care of people on breast diagnosis clinical pathways.

Despite this, to date there is no systematic overview of current advanced practice in breast imaging in the UK to inform future programmes and apprenticeship training. There is therefore a need for a systematic examination of individual studies to provide more comprehensive information. The aim of this study was to systematically review studies that explore advanced practice in mammography to assess the potential impact of a specific Advanced Clinical Practitioner training programme in breast diagnosis within the UK.

Methods

Search strategy

Preliminary searches were conducted using the EBSCO database. This provided insight into key terminology and relevant databases. Following on from the preliminary search, four main databases were systematically searched: ScienceDirect; MEDLINE; PSYCINFO; and CINAHL. These databases were included because they had been identified in the preliminary search as containing the journals relevant to the research topic. Boolean techniques (Table: 1) were used to ensure no relevant literature was missed in the search strategy. Using this search strategy, the key components were entered into the database with their alternative subject headings.

Given that Advanced Practice was introduced in breast imaging in 1999⁹ the electronic databases were searched from 1999 to January 2020. Moreover, given countries from outside the UK do not have the same approach to advanced practice, and the role of Advanced Clinical Practitioner only being introduced in the UK, this review only includes relevant UK articles.

Table 1 – Search strategy

Element	Alternatives	
1. "Advanced Clinical Practitioner**"	Radiographer* Mammographer* "Technician" Practitioner* "Consultant practitioner**" "Advanced practice" "Advanced practitioner" "Assistant Practitioner" "Extended role**"	
2. "Breast imaging"	"Breast X-ray**" "Breast Screening**" "Cancer screening**" "Diagnosis" "Diagnostic**" Mammography	"Breast compression" Tomosynthesis "Breast ultrasound" "Breast intervention" "Film reading"
3. "Breast cancer"	"Breast lesion**" "Breast Neoplasm**" "Breast malignanc**"	
4. "Hospital**"	Clinic* "National Health Service" NHS Private	
5. "United Kingdom"	"United Kingdom" UK England "Great Britain" GB Wales Scotland "Northern Ireland"	
Boolean Operators	1. "Advanced clinical Practitioner**" OR Radiographer* OR Mammographer* OR "Technician" OR Practitioner* OR "Consultant practitioner**" OR "Advanced practice" OR "Advanced practitioner" OR "Assistant Practitioner" OR "Extended role**"	
	2. "Breast imag**" OR "Breast X-ray**" OR Mammography OR "Breast intervention" OR Film reading" (Breast OR mammary)	
	3. "Breast cancer" OR "Breast lesion**" OR "Breast Neoplasm**" OR "Breast malignanc**"	
	4. Clinic* OR "National Health Service" OR NHS OR Private	

Eligibility criteria

The literature was reviewed utilising the inclusion/exclusion criteria (Table: 2). Literature was firstly screened based on titles and abstracts. Following this initial screening a full text screening was conducted for all the potentially relevant literature. The search was conducted on 20th January 2020, with the exclusion and inclusion criteria applied (Figure 1).

The search also included manual searching of the reference lists of papers and by hand searching the grey literature. A range of study types, including qualitative, mixed method and reflective evidence were sought to explore the current and potential impact of advanced clinical practice in breast diagnosis in the UK. Due to the qualitative nature of the research aim only qualitative descriptive elements of the papers were extracted for analysis.

Table 2: Eligibility Criteria	
Studies must include qualitative elements describing the role of advanced practitioners.	To develop an understanding of the current and potential impact of Advanced Clinical Practice in Breast Diagnosis
Studies must be UK based.	Countries from outside the UK do not have the same approach to advanced practice. Moreover, the role of Advanced Clinical Practitioner is being introduced in the UK.
Date limit: 1999-present.	Advanced practice was first introduced as a pilot in 1999, therefore studies were only included from 1999 onwards.
Exclude studies exploring the role of advanced practice outside the remit of breast imaging.	Given the aim of this review only, studies exploring the role of advanced practice in breast imaging were included.

Quality assessment

The Critical-Appraisal-Skills-Programme¹⁵ was chosen as the primary quality assessment tool for the selected literature. The CASP framework was chosen due to its diversity of assessment tools which allow users to critique a wide range of study types, which is important given the diverse range of studies included in this review. The CASP framework firstly consists of screening questions which can be graded numerically (0=No 1=Partly 2=Yes). A maximum score of 20 can be achieved for qualitative, and 22 for quantitative and case studies. Mixed method studies were graded on both their quantitative and qualitative elements. The quality of the selected literature was assessed by the first author. The assessment process

involved grading each study on the CASP quality criteria which include methodological appropriateness, recruitment strategies and research ethics. Studies with a score under 10 were excluded. The quality assessment process was cross checked by all authors of this work. Qualitative data describing the role of advanced clinical practitioners was extracted from each of the included articles.

Data extraction

The data extraction was carried out by the first author and cross-checked by all 3 corresponding authors to minimise selection bias¹⁶. Title screening was firstly used to extract relevant studies. If the titles did not provide enough information about the study to determine relevance, the study was included and filtered through a later process. Subsequent to title screening, abstract screening was used, which involved reading each abstract. Only abstracts that met the eligibility criteria were included (table 2).

Data synthesis and analysis

Following title and abstract screening, the resultant full-text evidence was read, and articles were included if they met the inclusion and exclusion criteria. Figure 1 demonstrates a breakdown of the included articles and the process of filtration. The included articles were weighted on their ability to provide rich detail on the current and potential impact of Advanced Clinical Practice in Breast Diagnosis.

Data synthesis and thematic analysis was carried out¹⁷, the data was coded with reoccurring patterns noted and organised into themes and sub-themes. Thematic analysis of selected articles was carried out by the first author and cross-checked by the corresponding authors to optimise robustness by means of triangulation.

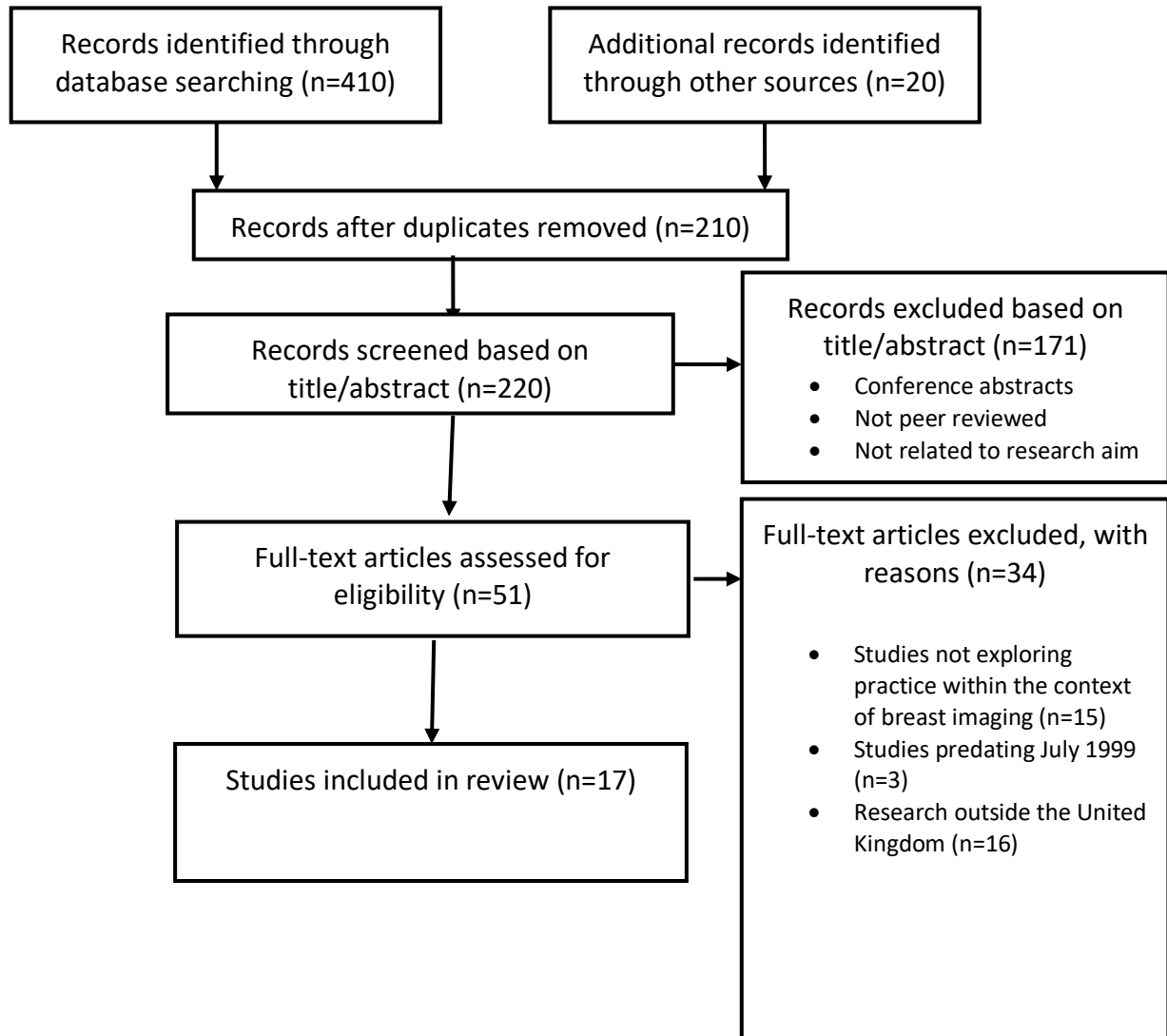
Results

Included studies

A total of 17 studies were included: 5 qualitative using semi-structured interviews and focus groups, 7 mixed methods using surveys and, 5 reflective case studies. Participants included: advanced practitioners (both radiographers and registered nurses), assistant practitioners, consultant radiographers, radiology managers and

patients. All participants were based in UK hospitals. Table 3 providing a detailed description of each study included in this review.

Figure 1: Study selection flow chart



Thematic Analysis revealed four key themes: multidisciplinary practice; roles and responsibilities associated with advanced practice; development and progression; embedding and sustaining advanced practice. Each theme is detailed below.

Theme one: Multidisciplinary practice

It was apparent that radiographer advanced practitioners working in breast imaging clinics interacted with multidisciplinary teams to deliver high quality care as part of

the four-tier system¹⁸. Although multidisciplinary practice is a feature to an extent in all clinical environments, it was particularly apparent within breast clinics given the wide range of staff involved in the patient pathway^{19,20}. Specifically, the included studies referred to breast care nurse specialists, pathologists, advanced nurse practitioners, advanced mammography practitioners, consultant radiographers, consultant radiologists, consultant breast surgeons and assistant practitioners as all being essential in the patient pathway^{18,21,22,23}.

Furthermore, it was noted that multidisciplinary practice in breast imaging not only helped with sharing information and knowledge, but enabled staff to support each other. For example, studies found that multidisciplinary practice allowed extra flexibility within teams for training and development which improved patient pathways^{22,23,24,25}. One way in which multidisciplinary practice allowed time for training and development was to more effectively allocate workloads. Rees in 2014²⁴ Snaith and colleagues in 2018²¹ and Deane and colleagues in 2019²⁵ carried out surveys and semi-structured interviews evaluating skill mixes in mammography departments. It was well established that assistant practitioners form a vital part of the skills mix in mammography departments. Furthermore, it was clearly demonstrated that a proportion of mammographers' routine work (undertaking screening mammography) is now being carried out by assistant practitioners, allowing advanced practitioner radiographers the time to develop their skills and take on tasks traditionally carried out by radiologists²⁰.

As well as providing more time for training and development, multidisciplinary practice within breast imaging was also found to be key to expanding and sustaining busy services to keep up with demand^{23,21}. Culpan²³ in 2016 described how an 'ultrasound bottleneck' in the breast clinic was overcome by obtaining a second scanner and training an advanced practitioner mammographer to work alongside the consultant radiologist. Thus, this evidence shows how workloads can often be shared to facilitate the clinical environment and support the patient pathway, whilst developing advanced practice.

Although all the studies suggested that multidisciplinary practice in itself, particularly in breast imaging, works well, the literature also identified a number of contextual factors which inhibited multidisciplinary practice and therefore advanced practice in

breast clinics. For example, McLoughlin and colleagues in 2014²² found that for advanced practice to flourish there must be a sufficient number of staff to continue providing the more 'traditional' and 'routine' care. However, recruitment, workloads and staffing shortages were found to inhibit multidisciplinary collaboration as mammographers had to continue to do the more 'routine' tasks due to a shortage of assistant practitioners therefore lessening the time they had for advanced practice^{22,26,27}. This is important given that it was found that, in departments that experienced fewer recruitment issues, more time was available for mammographers and nurses to develop into advanced practitioners resulting in services which were thus able to increase the numbers of patients seen in clinic¹⁹. Kelly and colleagues back in 2008^{26,27} evidenced that the shortages and high workloads of consultant radiologists prevented them from providing adequate time and guidance to mammographers to be able to safely and effectively develop their advanced practice. Training and education will be the subject of a later theme.

Summary of main findings:

- Multidisciplinary practice in itself, particularly in breast imaging, is essential for patient care and works well.
- Multidisciplinary practice was found to support development and education associated with advanced practice.
- Multidisciplinary practice was also found to be key in expanding and developing existing services to cope with increasing demand on breast imaging.
- Workforce shortages and high workloads for existing staff was found to prevent multidisciplinary practice and therefore the development of advanced practice in breast imaging.

Theme two: The roles and responsibilities associated with advanced practice

When discussing the role of advanced practitioners in breast imaging, studies referred to the four pillars of advanced clinical practice which include clinical practice,

leadership and management, education and research^{24,25,18}. However, these four pillars were discussed to different degrees, with most studies predominately focusing on clinical responsibilities which include image interpretation (reporting mammograms), ultrasound, tissue sampling and pre-operative localisation procedures^{24,26, 28,29}. Mammography image interpretation (MII) was the most commonly reported aspect of advanced practice in breast imaging. MII involves mammographers reporting mammograms to produce clinical reports and diagnosis²³. Despite this, a survey across twelve NHS Hospital Trusts by Woznitza and colleagues in 2020¹⁸ found that advanced practice in breast imaging frequently combined mammogram reporting with other roles such as breast ultrasound and stereotactic biopsies in 46 out of 67 cases (68.7%). Although non-reporting advanced practice was found to occur across all modalities it was predominately found in breast imaging^{23,18}.

However, it was evident that advanced practice was not limited to clinical practice, studies reported that leadership and research were also vital aspects of advanced practice. For example, it was often highlighted that clinical responsibilities such as MII were commonly combined with aspects of management and leadership which included clinical governance and modality lead^{18,26,27}. In terms of research, only one study included in this review explored the research roles of advanced practitioners in breast imaging, which included auditing and taking part in research studies²⁸. Furthermore, it was reported by those carrying out research activities in breast imaging that they received 'no' or 'unspecified' time for research due to high workloads despite having research responsibilities in their job description²⁹.

Although these studies provide some evidence of research and management in breast imaging as part of advanced practice, their sparsity must be acknowledged. Specifically, research and management responsibilities were explored to a much lesser extent compared to clinical responsibilities^{18,28}. However, the data analysed in this review suggest that the prioritisation of clinical practice over other domains of advanced practice seemed to be caused by service demand and professional responsibilities^{19,23,29}.

It was evident that with these different roles and pillars of advanced practice came confusion and role ambiguity. In some cases, it was reported that role ambiguity led

to many of the responsibilities of advanced practitioners going unrecognised^{19,30}. For example, Henderson and colleagues in 2016¹⁹ discuss that within a breast imaging centre involved in their study they had a radiographer 'carrying out the duties' of a consultant, but not so titled. Additionally, it was evident that the roles and responsibilities of advanced clinical practitioners working in breast imaging varied between the studies and were often dependent on the needs of specific clinics rather than standardised protocol^{19,20,29}. Back in 2006 Willson²⁰ highlighted one mammographer was trained by a radiologist to carry out ultrasound procedures because that particular clinic had a shortage of consultant radiologists able to carry out ultrasound and had an 'influx' of patients requiring the service.

Summary of main findings:

- Advanced practitioners in breast imaging have a diverse range of responsibilities which may or may not at present include management and research.
- The different responsibilities that come with advanced practice are often combined such as clinical and managerial work.
- The prioritisation of clinical practice over other domains of advanced practice such as research seemed to be caused by service demand and professional responsibility.
- Role ambiguity was frequently reported throughout the included studies leading to many of the responsibilities of advanced practitioners going unrecognised.
- No one advanced/consultant practitioner role is the same. Advanced practitioner roles can be moulded to suit the department and environment and service need.

Theme three: Development and progression

This theme is centred on progression and developmental requirements to develop into an advanced practitioner in breast services. It was apparent that education has

ranged from formal qualifications such as master's degrees to more informal on-the-job training (shadowing)^{19,25,31} Informal methods such as on-the-job training appear to rely on the expertise of existing staff such as radiologists and was mainly used for clinical aspects such as tissue sampling. However, it was suggested that now more commonly, informal on-the-job training is being combined (or supported) with formal postgraduate education^{18,19,23,29}.

Nonetheless, analysis identified several longstanding barriers to formalised education and training associated with advanced practice in breast imaging^{19,23,32,33} Henderson and colleagues in 2016¹⁹ administered questionnaires to lead radiographers and found that training and education barriers to evolving roles are multi-faceted. The study reported that fiscal pressures such as a lack of training budget can affect the quality and quantity of training and education available to support advanced practice. Additionally, access to postgraduate training and education was limited and often reliant on geography with more training being available in the more urban parts of the country such as London compared to the more rural parts, despite the availability of e-learning postgraduate courses¹⁹.

As well as financial, it was apparent that time pressures in busy departments reduced formal education and progression opportunities. A longitudinal study which interviewed eight consultant radiographers reported that 61% of participants received no time allocation for research³³. Furthermore, analysis suggests that the overall issue of recruitment in mammography for both radiographers and radiologists compound fiscal pressures. Specifically, it was discussed that the lack of appropriately experienced staff to train the trainees advanced practitioners led to decreased opportunities for development and training^{19,33}.

Alongside these contextual barriers, it was evident that a resistive/protective culture within the medical community existed towards advanced practice, even in breast imaging where advanced practice has been long established^{19,25}. Henderson and colleagues in 2016¹⁹ report that professional resistance is one of the main factors preventing change and role development throughout all areas of advanced practice, including breast clinics. For example, it was reported that some radiologists were protective of their traditional roles responsibilities and were aware in cases they were being replaced with advanced practitioners¹⁹. However, a lack of self-belief from

radiographers was also apparent with one study highlighting that a majority of radiographers felt that the expectation of achieving a master's or Doctorate qualification was overwhelming²⁵.

However, it must be acknowledged there appeared to be more acceptance of role development and progression in breast services compared to other sectors. Specifically, in some studies it was found that opportunities for mammographers to become involved in advanced practice and develop into consultant level are far greater compared to other modalities such as Magnetic Resonance Imaging (MRI) and Computed Tomography (CT)¹⁸. Furthermore, it must be acknowledged professional resistance was not identified in all the studies and in some cases, it was evident that radiologists welcomed the advancing roles and responsibilities of mammographers and radiographers. For example, it was often highlighted that radiologists are an essential training asset working alongside side mammographers and passing on their knowledge^{28,30}.

Summary of main findings:

- Training and education opportunities required for advanced practice includes on-the-job training to formal postgraduate qualifications.
- Training and education opportunities were influenced by a range of multifaceted issues from fiscal resources, to workloads, geographical location, and radiologist's openness to share.
- Opportunities for mammographers to become involved in advance practice appear to be greater compared to other modalities such as CT and MRI.
- Recruitment issues in mammography compound these factors by inhibiting the ability to make the allowance for training and development.

Theme four: Embedding and sustaining advanced practice

It was apparent that embedding and sustaining advanced care roles into practice was just as important as implementing and opening up advanced practice opportunities^{4, 31,32}. Despite this, most evidence analysed in this review was about implementing and entry into advanced practice, with often little information on the on-going challenges in relation to sustaining advanced practice^{4, 23,30}.

The studies which did contain information on sustaining advanced practice highlighted several factors which both hindered and supported sustainability. The main inhibitor seemed to be feelings of emotion and stress towards the increased roles and responsibilities held by advanced practitioners^{29,32}. While many practitioners expressed feeling a strong motivation and passion to make a difference through advanced practice, it was also highlighted that the role left them feeling pressured, with feelings of intense stress and at times isolated^{30,33}.

Emotions both positive and negative, appeared to be increasingly more prominent through role progression and during transition periods from advanced practitioner to consultant and specialist levels. For example, one study reported that the transition to consultant level from advanced practitioner was a highly emotional and intensely stressful experience to meet the expectations of the development programme/organisation⁴. Additionally, studies exploring advanced practice across multiple modalities (including breast imaging) found that practitioners often reported feelings of isolation due to the very nature of the role, and the fact that they were often one of the first people in that role³³. However, given the more established nature of advanced practice in breast imaging it was more apparent that radiographers' progressing into advanced practice were often not the first, and therefore had more support³³.

As well as negative emotions, several positive emotions were found to help practitioners embed and sustain advanced practice. Specifically, it was apparent that working patterns as well as achievement of objectives and good working relationships all contributed to the increase in reported confidence in the role⁴. Rees had reported similar findings in 2014²⁴ which found that when breast consultant radiographers developed good relationships with radiologists, they were able to agree on roles and made positive contributions to the department. However, despite the benefits related to workload and working patterns, the implementation of

advanced practice roles is often seen as a means to address an immediate service delivery need⁴. It was therefore unsurprising that feelings of stress and pressure were being added to and made more prominent by increasing workloads, demands on services and expectation on nonmedical practitioners/consultants^{4, 30}.

Summary of main findings:

- Emotions such as intense stress and pressure were expressed by advanced practitioners; being made more prominent by increasing workloads, demands on services and expectation on nonmedical practitioners.
- Given the more established nature of advanced practice in breast imaging feelings of isolation were less common in breast clinics compared to other modalities.
- Practitioners also expressed positive emotions such as motivation and satisfaction.
- Good relationships with radiologists helped to reduce feelings of stress.

Discussion

This review has provided a comprehensive overview of advanced practice in breast imaging across the UK, which identified four themes: multidisciplinary practice; roles and responsibilities associated with advanced practice; development and progression; embedding and sustaining advanced practice. Analysis suggests that each of these areas are key to developing and sustaining advanced practice in breast services, and can therefore be used to inform future programmes and policy.

Although advanced practice and its benefits are well established in breast imaging^{34,35}, findings highlighted several areas of practice where improvement can be made. Specifically, it was apparent that role ambiguity, recruitment issues, lack of support from radiologists and poor funding inhibited advanced practice^{19,29}. However, these barriers are not unique to advanced practice within breast services, similar

issues have been reported across different modalities and professions such as nursing^{36,37}. For example, one review in nursing highlighted issues around role ambiguity and unsupportive medical doctors noting that there is no clear pathway or framework for nursing staff undertaking advanced practice³⁶. However, it is acknowledged that the multi-professional framework established in 2017 and experienced professionals such as medical doctors play important supervisory and mentorship roles; as well as supporting funding for postgraduate posts.

Henderson's review¹⁹ evidenced a number of contextual barriers such as lack of funding for postgraduate education and geographical locations of training establishments. To address issues around access to education, NHS England in their latest framework for advanced clinical practice (ACP)³⁸ state that programmes should embrace the concept of learning at work to develop new ways of working. However, little evidence of this was apparent in this review particularly in relation to negotiation with employers and academic supervisors to formulate an individual learning pathway to suit individuals undertaking advanced practice. It is however recognised that many Higher Education Institutions have embedded individual learning pathways within their modules. As such consideration of specific service needs as well as the needs of practitioners was identified as a top priority from this review.

This review also helped to highlight several attributes unique to advanced practice in breast imaging. For example, it was apparent that many practitioners undertaking advanced practice in breast imaging felt less isolated and more supported compared to their counterparts in modalities and professions where advanced practice was less established^{24,33}. Literature has highlighted that the greater numbers of advanced and consultant level practitioners in breast diagnosis is due to it being a well-defined speciality, enabling mammographers to follow a predetermined range of training allowing them to hold their own workload^{26,27}. The established nature of advanced practice in breast imaging should therefore be incorporated and acknowledged in the design of any future training programme.

The recently released Advanced Clinical Practitioner (ACP) apprenticeship standard^{38,39} may help to address some of the challenges highlighted in this review by providing a more formalised route to advanced practice in breast diagnosis. It

would additionally support the development of research skills, education and leadership, and provide a more holistic approach to practitioner development. The recent ACP framework expects the ACP in breast diagnosis to use person-centred approaches to take an individual's detailed history. Additionally, they have the ability to examine body systems to help them make a diagnosis in addition to selecting / undertaking a range of appropriate clinical tests and assessments to help with diagnosis. The ability to analyse, interpret and act on these results and assessments and formulate a plan is all part of the scope of an ACP. The ability to take a comprehensive health history and examination of the breast and axilla are fundamental skills required by an ACP to assess a patient with suspected breast disease. However, given the long-established nature of advanced practice in breast imaging and the changing/increasing needs, the requirements of the developing advanced practitioner must be embedded into any advanced clinical practice (ACP) training through higher-level practice skills and knowledge in the context of service redesign and service needs. Furthermore, it is important to recognise that any programme developed would need benchmarking against relevant subject statements including the Framework for Higher Education Qualifications⁴¹ and descriptor for a higher education qualification at level 7 and the ACP Multi-professional framework for advanced clinical practice³⁸

In terms of evaluation and testing of any programme developed, it is recommended that Critical Realist Evaluation (CRE)⁴² is used to evaluate the import and impact of the Advanced Clinical Practitioner Apprenticeship training programme in UK breast imaging departments. Although CRE has not yet been used in radiography research, it has been used successfully in nursing and social care research to evaluate the effectiveness of similar interventions⁴³. CRE involves a systematic evaluation of an intervention which takes account of the intervention design, the effect of context, and the responses of stakeholders⁴². This is important given that outcomes are sparsely the result of an isolated intervention but instead are influenced by the setting in which they operate, and the people involved⁴⁴.

Limitations

It is recognised that restricting the search to English language articles and UK evidence may mean that some potentially relevant papers may have been excluded

from this review. However, given the aim of the review was to assess and inform developing advanced clinical practice in a UK context the transferability and relevance of these papers would likely be limited. Additionally, it is recognised that many of the articles included in this review were of poor methodological quality, for example, the reflective studies which were included. This may limit the transferability of the findings and the recommendations produced from this review. Despite this, these studies still provided useful descriptive elements to increase understanding of advanced practice in breast imaging.

Conclusion

It was evident across all themes that advanced practice is vital to supporting better care for patients attending breast imaging in light of workforce shortages. Although advanced practice and its benefits are well established in breast imaging, persistent barriers were acknowledged such as lack of strong framework surrounding advanced practice, recruitment issues, lack of support from radiologists and poor funding.

Findings from this review suggest that introducing a more formalised framework to advanced practice through the implementation of an Advanced Clinical Practitioner Apprenticeship training programme may overcome many of the longstanding barriers to advanced practice. Future empirical research is needed to explore and evaluate the import and impact of the Advanced Clinical Practitioner training programme in UK breast imaging departments.

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None

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