Exploring the role of the digital midwife as leaders in the implementation and adoption of an electronic health record: protocol for a scoping review of evidence

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Abstract

Background: Electronic health records (EHR) are quickly becoming an integral part of UK maternity services. There is a growing evidence base to support the necessity of accurate and timely reporting of a woman's pregnancy journey. This reporting ensures that information is easily accessible, that care is delivered in a safer way, and that efficient practice is supported (Payne et al 2015, NHS Digital 2018).

The Maternity Digital Maturity Assessment (2018) launched a plan to develop and recruit digital midwives as multi-skilled leaders. This team of leaders would understand both clinical and digital issues relating to implementing EHR in their departments (NHS Digital 2018). There are many challenges facing digital midwives when planning implementation strategies, as the entire workforce needs to be prepared for the disruption that change brings. Unfortunately, the evidence-base to support the development of digital maternity leadership roles, and by default, their influence on implementation and adoption of EHR, appears to be to be somewhat lacking (Wachter 2016, Topol 2019).

Research aim: This protocol outlines the plan to conduct a dual purposed scoping review. Firstly, it will offer the plan for an exploration of the current research landscape in relation to the role of the digital midwife. The second purpose will be to explore the digital midwife in relation to leadership effectiveness in the implementation, adoption or transition between EHR specifically within UK maternity services.

Search methods: This scoping review protocol was developed using the Arksey & O'Malley (2005) review framework, which was then enhanced by Levac et al (2010) to include more rigorous methods and will follow six steps. 1) Identify the research question 2) Identify relevant studies. 3) Study selection. 4) Extract the collected data. 5) Report the results and 6) consultation with stakeholders. A search of specific keywords will be carried out in the Embase, CINAHL, Medline and Scopus academic databases, and grey literature will also be searched. Relevant studies will be selected, then subjected to mixed methods narrative analysis to identify key themes for discussion.

Discussion: The narrative of this scoping review hopes to strengthen the case for research into multi-skilled, digitally prepared maternity leaders. Exploring the role of digital midwives is necessary to support them as leaders in the implementation of digitally capable services. Enhancing the knowledge around effective clinical leaders as agents for change could provide key evidence in maternity services and support the realisation of an effective digital strategy.

Keywords: adoption, champion, digital, electronic health record, leader, implementation, informatics, midwife: digital midwife

Background

A digital NHS: The big picture

The Department for Health and Social Care (2018) set the scene for current practice with regarding their vision for an effective digital strategy in UK health services and have identified four priorities. They aim to firstly, develop infrastructure that enables both national and local purchasers to invest in the most current technology that supports the needs of the healthcare workforce. Secondly, the vision of a digital provision that understands user need and scope for innovation. The third priority describes the enablement of short contracts to facilitate change where change is needed and at a time that is in keeping with trust funding capacity. Finally, the vision

of improved skill, and a culture of empowerment that supports the needs of the current workforce is defined and mapped in the fourth priority. It is envisaged that this will level the playing field in terms of digital literacy for all and promote effective recruitment into digital leadership roles.

Despite the vision for an effective digital strategy, it seems that innovative systems are being designed and commissioned at a speed to which the 1.4 million NHS staff are unable to implement or adopt effectively (Donaldson 2018). The resulting friction brought about by interoperability issues, lack of support and poor change management can result in costly implementation failure (Fragidis & Chatzoglou 2018, Pereira et al 2020), The responsibility of leading the team through this implementation period often falls in the lap of maternity leaders with an aptitude for technology. Sadly, the literature surrounding this is lacking and a formal role and national job description was not defined until 2018 (Gudgeon 2018). NHS Digital (2020) suggest that more work to establish the importance of digital leaders with clinical experience in the field of maternity is vital to creating a digitally mature service.

The digital midwife

To tackle this issue, findings from national reviews of maternity services across England and Scotland have been adopted as the catalyst for change in maternity digital maturity. The workstreams for harnessing digital technology as part of the maternity transformation programme (MTP) (NHS England 2021) are driving considerable change for maternity services across England. This includes the continuous rollout of electronic health records together with the goal of appointing of a digital midwife in every trust. NHS Digital (2020) describes the digital midwife as 'instrumental to the successful delivery of digital projects within maternity' (NHS Digital 2020:39). Conversely, the same report acknowledges that digital midwives often 'feel isolated' and that part of their role is to act as a change agent in inspiring the workforce throughout EHR implementation. On a more strategic level, digital midwives aim to ensure that issues around digital transformation in maternity are give consideration at every level of the organisation (Royal College of Midwives (RCM) 2021).

The digital midwife as an implementation strategy

In 2018, the NHS published its 'Maternity Digital Maturity Assessment' report (NHS Digital 2018) and argued that, if the maternity workforce is to stay abreast of the ever-evolving digital landscape, it is imperative that there are capable leaders championing this process. These leaders should have knowledge of both the maternity and health informatics arenas, such as digital midwives, and who are also skilled at managing change, and empowering the maternity workforce.

Alongside this, the National Maternity Review (National Maternity Review 2016) suggests that in order to forge a trusting relationship between a woman, her baby and the midwife responsible for her care, there needs to be a culture of trust and personal responsibility. Enabling this will contribute to the development of meaningful relationships between all systems involved in the care of a woman and her baby, including the adoption of digital technology. This ethos assumes an overall goal that understands more than just the midwife-woman relationship but managing the intersection between the health care professionals and how their digital tools support the therapeutic relationship. Despite the lack of evidence to corroborate this, it seems that the emerging role of the digital midwife could provide the conduit between each of these complex relationships.

Maternity services and electronic health records

The NHS maternity workforce considers themselves privileged to be part of a woman's childbirth experience (National Maternity Review 2016). The shared vision that every pregnancy journey is personalised by a workforce that delivers a quality service that is safe, effective and provides a positive experience for women. This means that maternity service leaders, including digital midwives, have a responsibility to ensure that staff are working effectively, and with the most effective digital tools available (NHS Digital 2018).

Affordable, maternity EHR technologies have been around for three decades (Evans 2016) and reporting on the impact of transitioning between one electronic health record to another will become more common as technology advances and systems improve (Saleem & Herout 2018).

The introduction of digital methods in dynamic environments such as maternity services, where women have historically been in control of their own paper medical record has been fraught with challenges (Takain et al 2012). These challenges are

often left unreported, resulting in individual staff members feeling forced to develop 'workarounds' to support their day to day working practices (Wachter 2016).

The challenges facing maternity services linked to accurate reporting became all too apparent during the Morecambe Bay Investigation (Kirkup 2015). Patient records were initially used as an investigative tool to make clinical decisions or identify potential learning opportunities. During the review they became evidence of grave negligence within the maternity services at a trust in the north west of England. Worryingly, the Kirkup review brought to light the potential dangers of failing to embrace modernisation by transitioning between legacy, paper documentation to safer, and more efficient practices, that are evidence-based.

The evidence-base that demonstrates the benefits and barriers to transitioning from paper-based patient health records to a new, EHR is well documented (Akhu-Zaheya et al 2017). What appears to be less commonly researched is the impact that effective digital leadership can have on the transition between paper health records and EHR or from one EHR to another (Saleem & Herout 2018). The literature exploring workflow redesign in terms of influencing clinical processes is also plentiful (Deokar & Sarnikar (2016). This is in contrast to very little literature that explores how these changes affect the workforce from multiple perspectives within UK maternity services and how digital midwives are championing change in their departments.

Preliminary searches the Cochrane Database of Systematic reviews, The Joanna Briggs Institute-Evidence Synthesis database and PROSPERO review database were carried out. There were no current or undergoing scoping reviews on the topic of the digital midwife. There were also no scoping reviews exploring implementation, adoption, or transition between EHR systems, specifically within maternity departments identified at the time of writing this protocol. As the evidence justifying the role of the digital midwife is also sparse, a broader search is needed therefore justifying this scoping review of evidence.

Scoping review aim

This protocol outlines the plan to conduct a dual purposed scoping review. Firstly, it will offer the plan for an exploration of the current research landscape in relation to the role of the digital midwife. The second purpose will be to explore the digital

midwife in relation to leadership effectiveness in the implementation and adoption of EHR specifically within UK maternity services.

Objectives

1. To identify what evidence exists concerning the role of digital midwife (or equivalent) in UK maternity services.
2. To explore the role of digital midwife (or equivalent) in relation to the implementation and adoption of a new electronic health record, or the transition between legacy systems (including paper) and a new system.
3. To identify current practices in relation to the implementation of electronic health records from the perspective of digital and/or clinical leaders.
4. To identify key gaps in the existing evidence base and establish the most urgent question(s) in relation to digital maternity leadership for future research.

Methods

This scoping review protocol was developed using a framework designed by Arksey & O'Malley (2005) then enhanced by Levac et al (2010) to include consultation with stakeholders. The following steps will support the development and dissemination of this scoping review:

1. Identify the research question
2. Identify relevant studies
3. Study selection
4. Extract the collected data
5. Report the results
6. (optional) consultation with stakeholders

Step one: identify the research question

This scoping review is being carried out to explore the current literature landscape relating to the experiences of maternity staff in relation to effective leadership and the implementation of a new EHR. It is intended that this review will inform the design of a primary research project based on the two questions that follow:

1. What is currently known about digital midwifery in both hospital and community settings?

2. What is currently known about leadership roles in relation to implementation and adoption strategies or transitions between legacy and new systems in UK maternity services?

Step two: identify relevant studies

Eligibility criteria

Constructing eligibility criteria for the inclusion of papers in this review has been challenging. Partly due to the complexity surrounding the dual purpose of the review and partly due to the lacking evidence benchmark pertaining to the role of the digital midwife within academic literature. Inclusion and exclusion criteria are 'informed by the review process' (Suchsrew 2019:417) and only loosely defined at the beginning of the search strategy. Appendix 1 demonstrates *a priori* criteria used at the beginning of the search, but it is worth noting that full inclusion and exclusion criteria will only become apparent once the scoping review process is complete. Table 1 illustrates the initial exclusion criteria to be used when reading titles and abstracts of search results.

All primary and secondary research that adopts qualitative, quantitative, or mixed-method approach together with grey literature will be included in this scoping review. The decision to broaden the search in such a way lends itself to the desired outcome of a scoping review in that a representative picture of the research landscape is more likely with a less restrictive search (Levac 2010).

Preliminary searches of 'digital AND midwi*' were conducted across CINAHL, MEDLINE and SCOPUS academic databases, which revealed no studies pertaining specifically to this role at the time of writing this protocol (February 2021). With this in mind, this literature review will be extended to include similar roles within the NHS. It will include 'IT midwife', and 'digital lead midwife' from the field of midwifery and 'informatics nurse*' or 'digital champion*' from the wider healthcare community. This list is not exhaustive, and similar roles will be added to the scoping review search as they emerge.

Alongside an exploration of the role of digital midwife, this scoping review is concerned with implementation science as the intervention and overarching theory utilised in the introduction of a new patient record in maternity services. The search strategy will include keywords or phrases that include Implementation; adoption; framework; transition, and after discussion with PhD supervisors, any of the four

most popular implementation science theories as defined by Wensing (2018) (National Institute of Mental Health 2018). The Diffusion of Innovations Theory (Rogers 2003), The Theoretical Domains Framework (Atkins et al 2017), Organizational readiness framework (Weiner 2009) and Normalization Process Theory (May & Finch 2009) will be added to the search terms.

This scoping review is also concerned with paper and electronic health records. Terms to be included are electronic health records, electronic patient records, patient records, maternity records, summary care record, and medical records. In order to potentially capture transitions between paper records and electronic records, or partial transitions, the keywords 'paper' and 'legacy' will be added to the search terms as commonly used phrases.

Only studies written in English in the first instance will be included due to the increased risk of bias, misinterpretation of meaning or loss of conceptual similarity during the translation process (Kirkpatrick & Dillingen 2009). Studies will not be limited on their date or geographical location as, at this stage, the specific practices or technological advancements are not being scrutinised.

Table 1. Exclusion criteria

1	Does not address the role of digital midwife (or equivalent clinical/digital leader) in the implementation, adoption or transition between (electronic) health record systems in maternity.
2	Is not focused on leadership responsibilities directly responsible for the implementation, adoption or transition between (electronic) health record systems in maternity.
3	Does not address the perspectives of the healthcare workforce (regardless of the grade) in relation to their interaction with the change associated with implementation, adoption or transition between (electronic) health record systems.
4	If the paper is not written in English.
5	The paper is addressing the implementation, adoption or transition between (electronic) health record systems from the perspective of participants outside the healthcare arena.

Search strategy

The search strategy for this scoping review has been developed with the advice of two PhD supervisors and consultation with an experienced research librarian. Pre-defined keywords suggested above and demonstrated in appendix 1 will be applied to relevant electronic databases. CINAHL, Medline, SCOPUS and Embase will be used to capture all health, health informatics and social science citations. Finally, Cochrane Central and Prospero literature review databases will be scrutinised to capture any literature reviews, published or ongoing that are related to the topic of digital midwifery, implementation science and EHR.

The search will include all studies regardless of their study design and will not be limited to peer-reviewed literature. Grey literature will be searched using google, google scholar and the open-grey database (http://www.opengrey.eu/) to capture policy documents, conference proceedings, official publications an anecdotal writing pertaining to digital midwifery as suggested by Higgins & Green (2011).

The last stage of literature searching will include a comprehensive hand search of the reference lists of all included studies to ensure that as much of the available, relevant literature in relation to leadership roles involved in implementing EHR is captured.

Scoping reviews are an iterative process (Tricco et al 2018). Although search terms are pre-defined, it is possible that further keywords relevant to the study will present themselves during the selection process (Levac 2010). These terms will be added to the search strategy, and the search re-run to capture as many relevant studies as possible. The full search strategy will be tabulated and presented in the final scoping review.

Step three: study selection

Once the searches are complete, all identified studies will be uploaded into the endnote X9 (desktop) reference management system and duplicates will be removed. Titles and abstracts will be screened by a lone researcher (as per the remit of PhD study) and two independent peer researchers will review a sample (10% of all round one included studies) to verify the screening process. Any studies not relating directly to the people involved in the implementation, adoption, or transition between electronic health records will be excluded; any disagreements between peer decisions will be discussed until consensus is reached.

The search and study inclusion/exclusion process results will be reported in full in accordance with the PRISMA-ScR statement as suggested by Tricco et al (2018) and The Equator Network (2019).

Step four: charting the data

The reviewer intends to identify evidence associated with digital midwifery and leadership and their role in the implementation, adoption or transition between EHR systems. Key information to inform a descriptive-analytical method of the evidence, as suggested by Arksey & O'Malley (2005), recommend charting the data as an exercise to identify potential comparisons between studies. The preliminary form shown in Table 2 aims to ensure that all data charted is consistent and in keeping with the review questions. The final data collection form will be refined via consultation with PhD supervisors, peer research colleagues and selected members of the digital midwife community. This is to ensure that the form is of suitable quality and applicability (Daudt 2013) and is in keeping with the Joanna Briggs Institute scoping review framework (Tricco et al 2015).

Table 2. Preliminary data charting elements

Element and sub-elements	
Publication details	**Reviewer question**
Author(s)	Who wrote the paper or article?
Paper type	Empirical research, opinion piece, editorial, conference proceedings etc?
Year	What year was it conducted and/or published?
Geographical location	Which country, region or population type is the paper focused?
Study/paper characteristics	
Study design	What methods were used to collect information?
Aims	What are the main goals of the paper?
Population	Is there a population being considered? What are they?
Study/paper focus	What is the main focus? Implementation science, maternity leadership or something else relevant to the review questions?
Study/paper setting	Describe the context to which the text is referring
Study/paper perspective	Is the focus on implementation of EHR, on leadership in maternity or both?

Content	
(Electronic) health records	Is the main focus on electronic (or paper) health records in maternity?
	Please explain?
Leadership	Is the main focus on leadership in maternity?
	Please explain?
Electronic health records and leadership	Is the paper of dual focus and discusses electronic health records and leadership in maternity?
	Please explain?
Implementation science	Does the paper include implementation science as a theoretical underpinning in relation to the implementation, adoption or transition between health record systems?
	Please identify which?
Other important features	Please include any keywords not previously included here?

Step five: report the results

Levac et al (2010), supported by Tricco et al (2018), suggest reporting the results in 3 stages to foster a more systematic and rigorous approach to the review. This scoping review will adopt the suggested method and draw its conclusions from the narrative.

Stage 1: analysis

All included studies, together with any conference proceedings or non-academic articles will be uploaded into the NVivo data analysis software (QSR International Pty Ltd 2020) for qualitative content analysis and generation of themes. Quantitative data will also be analysed this way as the scoping review only aims to report on summaries of key findings and not a critical appraisal of the literature. Despite its benefits, no quality assessment will be carried out as this does not align with the purpose of a scoping review in exploring a potentially large volume of literature.

Stage 2: reporting

Narrative analysis across all included papers will summarise the breadth of existing literature and identify potential gaps in the evidence base. These findings will be discussed, and a summary of all included study findings will be presented in a data table.

A numerical descriptive analysis relating to study characteristics such as study design, types of intervention in relation to EHR implementation, population characteristics that relate to the job role being investigated and research environment (primary or secondary care, UK or abroad) will be carried out and reported pictorially within the scoping review report. The final data categories will be developed post-hoc to allow for novel findings.

Stage 3: apply meaning

Themes generated within this scoping review will be used to inform doctoral research design which aims to adopt a qualitative methodology to firstly investigate the role of the digital midwife. Secondly, it hopes to explore their impact on the implementation, adoption, or transition between legacy (electronic or paper) and EHR technologies as an area of research that is necessary, novel, and current.

Digital strategies in the UK appear to be evolving at a rate where the influence that digital midwives can have on policy and practice is essential to implementation success. This scoping review could potentially support the development of the role in accordance with the suggestion of NHS Digital and their entire digital maternity strategy.

Step six (optional): consultation

Levac et al (2010) describe consultation activities (step 6) when conducting a scoping review but suggest a lack of clarity of purpose. Further investigation via the Joanna Briggs Institute (Peters 2014) suggests that consultation with peers and key stakeholders be written into the scoping review from the outset. Preliminary consultation activity was carried out volunteers from the digital midwife community who were asked to volunteer suggested search terms for inclusion. The same expert reference group will be approached to discuss the findings of this scoping review and aid in the development of a meaningful research question.

Dissemination plan

It is anticipated that there will be two products generated by this scoping review. Firstly, the advancement of knowledge surrounding the most urgent research questions, especially with respect to the role of the digital midwife. This new knowledge will inform the design of a full research project which explores the role of the digital midwife in relation to EHR implementation. Secondly, the scoping review

findings will be disseminated via scientific journals specific to maternity research communities and echoed on academic and social media platforms.

Ethical considerations

This scoping review aims to investigate the breadth of existing, primary research regarding EHR and the digital midwife and, as a secondary analysis of primary data is being carried out, does not require ethical approval. An ethics checklist provided by the supporting university has been completed and is available to view on request.

Author

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Appendix 1: Search terms/strategy

	Search term(s)	SCOPUS	CINAHL/ Embase	MEDLINE	PsycInfo/ APA PBSci.
#1	"digital midwi*" OR "digital lead midwi*" OR "informatic* nurse" OR "digital (champion*)" OR "EHR friend"				
#2	Implementation OR adoption OR transition OR framework OR "diffusion of innovation*" OR "theoretical domain* framework" OR "organi*ational readiness framework" OR "normali*ation process theory"				
#3	"electronic health record" OR "electronic patient record*" OR "patient record*" OR "maternity record*" OR "summary care record*" OR "medical record*" OR "paper record*" OR "legacy system"				
#4	#1 AND #2 AND #3				
#5	English				
#6	Duplicate removal				