Reinterpreting the Nursing Record for an Electronic Context: Development Principles

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Abstract. The full potential for electronic health record systems in facilitating a positive transformation in care, with improvements in quality and safety, has yet to be realised. There remains a need to reconceptualise the structure, content and use of the nursing component of electronic health record systems. The aim of this study was to engage and involve a diverse group of stakeholders, including nurses and electronic health record system developers, in exploring together both issues and possible new approaches to documentation that better fit with practice, and that facilitate the optimal use of recorded data. Three focus groups were held in the UK and USA, using a semi-structured interview guide, and a common reflexive approach to analysis. The findings were synthesised into themes that were further developed into a set of development principles that might be used to inform a novel electronic health record system specification to support nursing practice.

Keywords. electronic health records, nursing, nursing records, software design, user-centred design

1. Introduction

The potential role of electronic health record systems in the positive transformation of care, and the promise of improvements in care quality and safety, have long been recognized [1,2]. However, this promise has yet to be fully realised.

Contemporary electronic health record systems appear unable to reflect and support the needs of practice and to meet expectations around improvement. A recent

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integrative literature review [3] identified several nurse workarounds to electronic health records, such as omission of process steps, and explored their role as a contributing factor in healthcare errors, particularly in the context of medication administration. The authors also investigated the causes for the workarounds, with usability standing out as a major factor. Poor usability of digital systems has been associated with adverse patient outcomes, and higher levels of discontent among nurses [4]. Inflexible technologies may also impact negatively on nurse autonomy, again resulting in workarounds that may compromise patient safety. In order to overcome these issues closer engagement between developers and users (and researchers) to improve design and implementation through better shared understanding, involving nurses in all aspects of electronic health record system development is crucial [5].

The COVID-19 pandemic precipitated the rapid adoption of new technologies [6]. However, the pandemic also appears to have cast a light on pre-existing and ongoing problems with electronic health record systems. Early into the pandemic, Dykes and Chu [7] argued that while attention had been directed towards newer technologies, they also argued that '*utter disregard has been shown to the 'usual' poorly designed technologies that nurses used every day preceding the pandemic and will continue to use during and after the fact*' (p e25). In common with other researchers, the authors called for opportunities for collaboration to create a shared understanding between developers and users of emerging and existing technologies.

These recent studies point towards a need for change in how we conceptualise nursing record systems. They also point to a need for better engagement, involvement and collaboration in the quest for a shared understanding of electronic health record system requirements. A previous literature review [8] provided the foundations for the current study by critically examining existing approaches to nursing records, highlighting the variability in how electronic health record systems are built, with consequent implications for patient safety.

The aim of the current study, was to engage and involve a diverse group of stakeholders in exploring issues and possible new approaches to documentation, using patient-centred nursing as the focus, that better fit with practice and that facilitate the optimal use of recorded data.

2.   Methods

Three focus groups were held online with a diverse group of consenting stakeholders (vendors, informatics specialists, nurse users, managers and leaders). The participants were based in the UK and the USA and were drawn, from existing networks, to provide a range of knowledge, skills, and experience. Each project partner was responsible, from recruitment to analysis, for managing the focus group associated with their own country. Each focus group took as its focus one of three themes (note that the findings associated with each focus group are not necessarily applicable within the other country): *standards*, *decision making* or *documenting* (as used in the preceding literature review [8]). A fourth theme, *abstraction and summarisation*, was considered across all focus groups.

The focus groups all drew on the same semi-structured interview guide (derived from the literature review) and followed the same format. They ran for approximately one hour and, following brief rationale and introductions, the facilitator (a project partner) worked through the interview guide, eliciting responses from all participants.

Each focus group ended with a short debrief. The focus groups were held via Teams (hosted by the University of Huddersfield) and were video and audio recorded. The recordings were made available only to the project partners.

The project partners were responsible for analysing their own focus group data, using the interview guide to identify a priori codes and to frame the analysis, taking a reflexive approach to coding and without regard to the findings from other focus groups. Thematic analysis was conducted directly from video/audio. Once all the three focus groups were analysed, the individual analyses were sent to the project coordinator (NH) for synthesis (through further clustering of codes and development of themes) to inform a high-level generalisable nursing record system specification, via a common set of derived principles that might underpin development (hereafter referred to as development principles).

Ethical approval was granted by the Research Ethics and Integrity Committee of the School of Human & Health Sciences at the University of Huddersfield, UK.

3.   Results

The 3 focus groups were held in June/July 2021; there were a total of 23 participants across the two countries (UK, USA). Findings from each of the focus groups are summarized below (as analysed by each of the facilitators). While examples are given for each of the derived themes, these are not comprehensive, and due to space limitations, it was not possible to include supporting quotes.

Findings from the *standards* focus group fell into four main themes.
1.   Structure - agreement that the framework underpinning electronic records systems for nursing might be inappropriate for contemporary nursing.
2.   Process - a need to work on digital workflow for agreed longitudinal, multidisciplinary clinical pathways.
3.   Purpose - a need to go back to basics in understanding the purpose or goal of documenting.
4.   Context - a desire for change across the profession.

Findings from the *decision making* focus group fell into four different themes:
1.   Data capture and system interoperability - a need to enable the provision of 'the right information at the right time' to support decision making.
2.   The importance of standards - a need for national standards to enable the documenting of patient care.
3.   Changes to the ways of working - a need to change the way in which nurses' work and record care.
4.   Developing informatics skills - a need for investment and the identification of the right training to create capability in the profession.

For the *documenting* focus group, a two-person consensus approach was used for identification, validation and categorization of findings. These were organised into two broad areas:
1.   Barriers - lack of capture, storing, and presenting of relevant patient information; lack of patient centeredness; poor adoption of nursing terminologies; poor design of the electronic health record.
2.   Solutions - a need for solutions and nursing specific tools that capture nursing practice; a need for adopting terminologies (and electronic health record integration) that link nursing practice and patient outcomes; a need for nursing

specific tools that capture the patient voice; the use of the electronic health record as a communication tool; the need for a fundamental redesign of the electronic health record.

The focus group findings were summarised as 47 source requirements, such as *Clarity in purpose of documenting*; *What good looks like*; *Understanding at senior level*; and *A record of care delivered and its impact*. These source requirements were then grouped by conceptual similarity into 13 more general development principles which aggregated around 5 broad development areas, as presented in Table 1.

Table 1. Derived development principles and development areas

Derived development principle	Derived development area
1. There is a shared understanding of purpose	Development conditions
2. People are prepared for implementation and use	
3. There is an inclusive approach to development (involving multiple stakeholders and shared ownership)	
4. There is an evolutionary approach to development/maintenance (and opportunities for innovation)	
5. The system is structured around the citizen	System 'values'
6. The information meets disciplinary and multidisciplinary needs	
7. The system provides support for clinical decision-making	
8. The available content covers the domain	
9. The system is intuitive (and easy to use for entry, access, and visualisation of data)	System features
10. The system can be customised to individualise care	
11. The system is able to exchange and make use of data from other systems	System functions
12. The system supports defined digital workflows (multidisciplinary care pathways, and a single longitudinal record)	
13. The system is underpinned by (reusable) data (a single multidisciplinary terminology), documentation (a defined information model to support data entry and retrieval), and digital practice standards	Standards

4. Discussion

It is clear from discussions across the three focus groups that the frameworks that underpin electronic records systems for nursing are currently suboptimal, and there was a general call for a new approach, particularly to support care planning and the patient journey, packaged in a way that supports procurement and development.

There appears to be a hunger to reconceptualise nursing documentation and a felt need for an inclusive approach to both re-development and culture change that ensures buy-in from all stakeholders – nurses, nurse leaders, citizens, policy makers, regulators, professional organisations, and other disciplines. There is a need to: refine digital workflow to support multidisciplinary clinical pathways; better understand the important enabling and supporting role of documentation; engage and involve citizens in some degree of active co-ownership of their own records; agree on an appropriate balance between standardisation and personalization, with a more comprehensive standardized terminology and an agreed information model.

There was a call across focus groups for: good digital application design; a citizen-centred transdisciplinary approach; effective data sharing across the multiplicity of disciplines, platforms and organisational boundaries, and interoperability between

independent systems; supportive digital practice standards; and pre- and post-registration education and training to enhance data capability at all levels.

Finally, there was an expectation that people will be required to work differently, with a continuous re-imagining of practice, and support for ongoing innovation.

The derived development principles are the main product of value from this study, and we recommend that these be taken forward into future work in this area, such as electronic health record system development programmes. We would also call for sustaining 'ownership' of these evolving development principles, shared across key stakeholder groups at both national and international level.

5.   Conclusions

This study has shown that it is possible for a diverse group of stakeholders to work together towards a common understanding of requirements in the development of an agreed set of design principles for electronic health record systems. Moving forwards, there was an acceptance across participants in the study that, as electronic health record systems evolve, there will be a need for users to work differently, as part of a continual reimagining of practice.

Acknowledgements

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