Going paperless – Qualitative monitoring of staff morale during the transition from paper to electronic health records

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A R T I C L E   I N F O

A B S T R A C T

Background: Organisational change is an important part of development and growth. Transitioning from paper-based hospital records to electronic health records improves efficiency and patient safety by streamlining data access and reducing the risk of errors, ultimately leading to enhanced patient care and outcomes. In October 2020, a large NHS trust underwent the transition from paper notes to a fully electronic health records system. Therefore, the purpose of this study was to monitor staff morale during this organisational change; to highlight any issues arising that may impact on the smooth transition; to encourage feedback.
Methods: A questionnaire was distributed to all members of the maxillofacial outpatients department on a regular basis. The qualitative responses were analysed using NVivo, following a framework analysis model.
Results: The analysis generated 1319 codes, which were placed into 68 groups. The three main themes were 'Transformational Advancements in Healthcare Delivery'; 'Obstacles to Seamless EHR Integration; 'Navigating the Transition and Evolving Perceptions'.
Discussion: Regular monitoring of morale and staff opinion allows for smoother transition in a large-scale organisational change. The results of this project will help future hospitals and trusts undergoing similar transitions.

1. Introduction

Organisational change is an important part of development and growth, allowing the institution to adapt and evolve. When change is well planned, effectively communicated and the impact on employees considered, it will allow the organisation to progress and adapt efficiently [1]. However, if it is managed poorly, the wellbeing of employees can be affected and they can lose motivation, especially when their perceived degree of control over the change is removed [2]. This would affect the productivity and efficiency of the organisation.

Achieving continuity of care requires quick access to the patient's records at any point of contact, and this is offered by an electronic health records (EHR) system, strengthening the argument for the change [3]. However, the biggest obstacle to the transition is not

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financial, but cultural [4]. An extensive literature review identified that resistance to change is particularly problematic when it comes to EHR implementation [5]. It has been suggested that effective management of change should include substantial prior preparation, good internal communications strategy involving staff for consultations, engaging employees and encouraging team working to help each other adapt [6,7]. Transitioning from a paper-based system to EHR can initially seem daunting, but when split into smaller tasks, it appears to be more achievable [3]. Despite the challenges associated with the implementation of a new electronic system, it will allow for improved creation, storage, organisation, medical data audits, management and analysis; and edits to the medical records, therefore enhancing the delivery of healthcare [3,4,6,8–13].

Previous investigations have revealed that organisations undergoing EHR implementation typically require a period of approximately 2 years for the conversion process. This timeframe is dedicated to establishing the necessary infrastructure, ensuring the availability of computers and workstations, and for staff to get accustomed to the software [14]. Several publications have extensively documented the advantages and obstacles related to EHR adoption [11,15–17]. Potential issues include cluttered screens with items which are not utilised causing cognitive strain [18], a number of actions resulting in the same outcome resulting in confusion [19,20], difficulty reading and understanding the notes due to lack of personal touch [21], difficulty in finding specific notes [14], improper medication dosing orders [22,23] and a large drop in staff morale and increased staff burnout during the transition [24–28]. However, ultimately EHR aims to improve efficiency, reduce errors and provide timely care, all of which are the documented advantages of transitioning from paper to electronic records [29,30].

In 2018, a large NHS trust in the south west of England, announced a multi-million pound organisational change project to move all patient records and communications to a fully electronic system [31]. Prior to this, the trust used paper notes and a number of different electronic systems to send referrals, letters, view radiographs and request tests and medicines. The new EHR system incorporates all these different aspects into a fully computerised system, making the access of records more efficient, as well as improving safety for the patients.

The initial stage of this change involved communications with trusts who have already had this system instated to ensure a smooth transition. Approximately 6 months prior to the transition date, a handful of staff from each department were asked to become 'Superusers'; and received additional hands-on training. The rest of the department were asked to complete online induction material and attend a classroom training session. Initially the launch was meant to happen four months earlier, but this had to be postponed due to Covid-19 pandemic, which also had an impact on training provided. Staff were also asked to practice in a safe 'Playground' version on dummy patient accounts, to get used to the system and resolve any arising issues prior to the launch. The 'playground' continues to be available to experiment with prior to trying out functions in the live system.

The Oral & Maxillofacial Outpatients Department in the hospital undergoing the transition consists of a number of staff members, including consultants, nurses, receptionists, secretaries, speciality doctors, trainees and students. The system allows different level of access depending on the roles of staff. To ensure the ability to help each other during this large-scale change and allow for timely resolution of any arising issues, a project to monitor organisational change within the department was initiated.

The aims of this project were to understand the attitudes and beliefs of staff towards the transition from paper to EHR; to analyse the positive and negative aspects of the change as perceived by staff, and to propose suggestions for future hospitals and trusts undergoing the transition. The rest of the document is structured as follows. Section 2 will discuss methodology including patient and public involvement, participants, data analysis and reflexivity. Section 3 will offer the results and the findings of this study, including three main themes identified. Section 4 will provide the discussion around the topic and the results, offering study limitations as well as the conclusion.

2. Methods

2.1. Patient and public involvement

A Public and Patient Involvement (PPI) consultation was initially carried out with members of the department, including qualified nurses, junior doctors and speciality doctors, all of whom have worked with the previous paper-based system and will be working with the new EHR system after the transition. The PPI consultations encourage members to actively engage with research design, planning, conduct and its dissemination [32], and are endorsed by The National Institute of Health Research and National Institute for Health and Care Excellence [33,34]. The consultation reviewed the importance of this transition project, the burden of the intervention and the pre-prepared questionnaires. The stakeholders identified areas of improvement, potential barriers and how to overcome these as well as how to disseminate the results. Following this, the questionnaire was adjusted accordingly, and a local research and development approval was granted by the NHS trust.

2.2. The participants

Informed consent to take part in this study was obtained from all participants. The questionnaire (Supplementary File) was distributed to the same members of staff on multiple occasions throughout the transition – weekly for the two weeks prior the change (to gain baseline information), weekly for the first month, bi-monthly for the second month and monthly thereafter for a total of 6 months after EHR implementation. The department consisted of: 3 consultants, 6 middle-grade doctors, 6 junior doctors, 3 secretaries, 2 receptionists, 11 dental nurses and visiting medical and dental students. All members of staff from the department agreed to take part in the study and fill out the anonymous questionnaires on the weeks they were at work. Upon completion, the completed questionnaires were placed in a sealed box to maintain anonymity. On average, 24 anonymous responses were received on each occasion,

amounting to average response rate of 77%. The survey asked for free-text responses using open-ended questions, for example asking to list the positive aspects of the system. Therefore, if the comment was listed under the 'positive' part of the survey – it was analysed under the 'positive' heading. The flowchart of the study methodology is shown in Fig. 1.

2.3. Data analysis

In order to improve study trustworthiness, rigour, credibility and ensure content accuracy, the transcripts underwent member checking by the participants during Audit meetings, as well as peer-review triangulation [35–37]. The data were analysed by the author employing framework analysis and the six steps as suggested by Braun & Clarke (2006): familiarising yourself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and finally, producing the report [38]. The author read the full transcriptions twice before formulating initial codes, which were merged into sub-themes. Following this analysis, further triangulation was conducted using the members of staff in order to ensure rigour, validity, accuracy and trustworthiness. The data generated by this study was organised using 'NVivo Pro' [39].

2.4. Reflexivity

One of the key pillars of credibility of a qualitative study is reflexivity [40]. Although the responses were anonymous, the study lead was known to the participants professionally, as she was a female Registrar doctor working in the same outpatients department as studied in this project. The lead had reflective conversations about the project with the rest of the authors regularly in order to minimise possible bias from the lead's perspective [37,40,41]. This ensured transparency about the authors position and the influence on this project, and strengthened trustworthiness [37].

3. Results

A total of thirteen weeks of surveys were transcribed and examined. The analysis generated 1319 codes, which were placed into 68 groups. The three main topics were 'Transformational Advancements in Healthcare Delivery'; 'Obstacles to Seamless EHR Integration'; 'Navigating the Transition and Evolving Perceptions'.

3.1. Transformational Advancements in Healthcare Delivery

There were many positive comments about the transition and the new system. These were grouped into 22 sub-themes and 4 overarching themes (Table 1).

A few main points were mentioned frequently. Being able to locate and access notes on demand using a PC or the phone meant notes
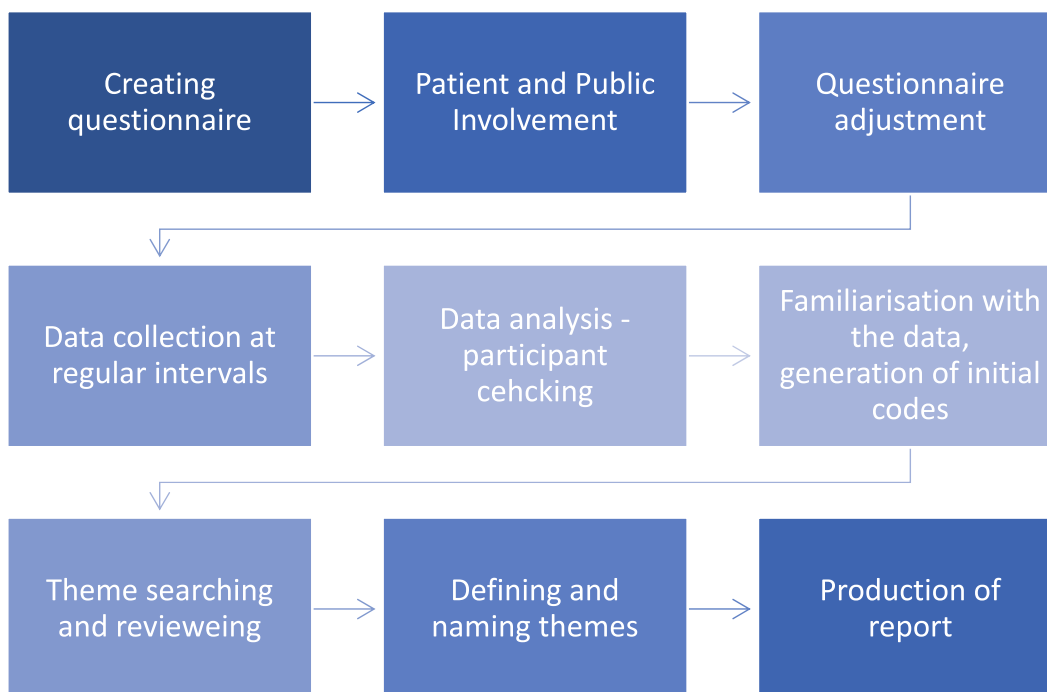

Fig. 1. Study methodology flowchart.

are not lost and can be viewed anytime, anywhere:

> "*No more missing notes, better for cross-contamination*"

The readability of notes was an improved feature:

> "… *quality of paper notes significantly deteriorating over the years*"

> "Not having to de-code illegible handwriting"

Manual handling issues with paper notes was no longer a problem:

> "*It saves my back, not having to carry heavy paper notes around!*"

Members of staff were impressed by the streamlining of processes:

> "*Everything in one place, all coordinated, easy access to information*"

Staff were also very happy about the efficiency:

> "*One login, efficiency of information transfer*"

A big positive topic was the new helpful features:

> "*Order sets less time consuming*"

> "*Remote access and being able to take clinical photos on the phone*"

The system also allows remote consultations to be done from home whilst having the same access:

> "Telephone consultations, being on-call, being able to document and book appointments remotely"

Staff also felt the new system was fast to use:

> "… *less time wasted*"

> "Having all information at your fingertips quickly on every patient"

Table 1
Transformational Advancements in Healthcare Delivery and the sub-themes emerging from the transition to EHR system.

Codes	Sub-themes	Themes
It saves my back, not having to carry heavy paper notes around!; No more missing notes, better for cross-contamination	Benefits of digital documentation	Enhanced workflow efficiency and documentation
No lost/missing referral letters		
Clear combined data and documentation; Ability to get a clear background/ history without having to look through notes		
Quality of paper notes significantly deteriorating over the years; Being able to read all of the notes and not having to de-code handwriting		
Easier for audit	Efficiency and convenience	
Easy to navigate; It has amazing potential for ease and efficiency		
Speed of use; Having ALL info at your fingertips quickly on every patient		
Can prepare for clinic/theatre more easily in advance; Can look at lists in advance at home!		
Endless capabilities; I have wanted this sort of thing for years		
Customisation of the platform to allow a quick personalisation; Order sets -less time consuming; Remote access, photos		
Access to all the info at home making being 2nd on-call much easier with the ability to know how busy the SHO's are and if they might need a second pair of hands		
Wouldn't go back - far too reliant on some aspects of EPIC by now.		
Easy chatting to doctors on EPIC secure chat, whole team being aware of patient management with more access	Enhanced communication and collaboration	
Consent process is fast and clear		
Slick transfers; Patient care, all info in one place; Patient safety	Enhanced patient care and safety	Quality of patient care and clinical processes
Easier ward rounds; Being able to visualise obs		
Personalising; Bulk booking orders	Efficiency and convenience	
Everything in one place (all coordinated, easy access to information		
Seeing things quickly - quick access to records, no waiting; Real time info		
Using less paper/ less trees; More environmentally friendly	Environmentally friendly	Environmental and administrative impact
Frees up staff for less admin long term; All the patient work is done on accessing the records and don't need to worry about completing those tasks later on	Less admin long term	
Patient autonomy and being more involved with their own medical care; Transparency and access to results	Patient autonomy with sister app MyCare	Patient-centred outcomes

3.2. Obstacles to seamless EHR integration

Staff members were given an opportunity to express the negatives of EHR. These were grouped into 30 sub-themes and 4 overarching themes (Table 2).

The main negative comments stemmed from a few sub-themes. Firstly, increased time demand was mentioned in a number of responses:

> '*Takes too long to complete everything*''

As well as that, there were several issues with the training received. Primarily this stemmed from the lack of training as well as the quality:

> '*Training has been shocking, many feel under-prepared*''

Initial problems were also mentioned frequently during the first weeks of the transition:

> "Today, as a trust, we were unable to make follow-up appointments''

> " … unable to close down encounters''

> " … error message still coming up''

These issues were later resolved and reduced in frequency over the course of the transition. The systems complexity was another negative topic:

> '*Seems overcomplicated and lacks intuition*''

The last significant topic of this theme was the limited access to the system for the OPD dental nurses as well as medical students. Nursing staff felt underprepared and underutilised, causing a big decline in morale:

> '*Loss of some of my jobs within my role. I feel a bit redundant at times, I worry this will affect morale*''

> " … it's been frustrating from the perspective of a qualified dental nurse with experience of note taking etc to simply sit and chaperone''

> "*feeling a bit redundant whilst clinicians are overwhelmed*''.

Table 2
Obstacles to Seamless EHR Integration and the sub-themes emerging from the transition to EHR system.

Codes	Sub-themes	Themes
Training has been really inadequate.	Training issues	Training and adaptability challenges
Adapting to new methods; massive paradigm shift/change	Adapting to new methods and challenges	
Staff learning at the same time, not feeling confident with colleagues to help; unable to make appointments		
I have found a more efficient way of using the system efficiently…until they did an update		
Computers lock out quickly; "computer says no" scenarios	Technical issues and concerns	
Risk of cyber-attack; computer glitches; if the system goes down the hospital can't function		
Lack of PC's available		
Headaches - looking at a screen through eye protection is really becoming problematic		
Some difficulties discharging/transferring	Patient discharge and transfer issues	Workflow and operational issues
Difficulties with patients being seen in ED and then to return the following day for CEPOD		
Lengthy process involved in admitting patients from clinic to ward		
I'm still not able to sign off patients as myself as I have been entered incorrectly into the system.	Workload and time management	
Extra work normally done by reception/secretaries affecting time management		
A lot of time required for data input.		
Very clinician heavy; Senior staff now doing secretarial work and nurses get bored		
A&E disjointed with separate charting; can't go back into consult once you've signed the note	User interface and complexity	
Messy complicated screens; too many tabs to fill in; feels like lots of repeating yourself.		
Listing patients is too fiddly in my view; insufficient theatre time		
Doctors have no control over their list		
Not able to book 2 appts unless 2 orders are placed; no idea where patients have gone - invisible waiting list	Waiting list management	
Loss of some of my jobs within my nursing role. I feel a bit redundant at times, I worry this will affect morale	Impact on role and morale	User involvement and system design
Time management, may impact on learning opportunities as note writing/admin may take longer	Reduced learning opportunities for trainees	
I've seen note entries that have stated 'unsure on reason for referral - not called/bleeped etc'	Reduced quality of referrals	
It would be great to be able to customise things on a department level	System flexibility	
As with many systems you have to rely on the person before you correctly completing each step	Reliance on staff who saw the patient previously	
Patient access to notes is adding pressure to consultations, especially head and neck cancer query	Impact on consultations and patient care	Patient and communication concerns
Typing whilst conversing with patients can appear detached, apologising for the 'system' all the time		
It's pushing everyone over the edge; easy to make mistakes. It's a working nightmare	Challenges and stress	
Issues arising too fast for IT to solve quickly, i.e. unable to sign off LA lists etc		
Old medical information/op notes/scans will be missed (i.e. cancer long term patients)	Concerns about missing old medical information	

3.3. Navigating the Transition and Evolving Perceptions

A number of comments were made about anticipating issues with the transition, hopeful expectations and the assumptions that it will be good in the long run (Table 3). However, there were also comments which expressed frustration, nervousness and negative expectations. Some staff members believed that most of the learning about the new system will be done once it's live and many mentioned they would not wish to return to paper notes if given the chance.

Useful suggestions were mentioned, which would be particularly beneficial for the future trusts and hospitals undergoing this change (Table 3). Cross-training between different staff roles would be advantageous to allow helping each other resolve issues. It would also be useful if the system technicians could revisit the department sometime after the launch to help optimise the system and answer any questions. iPads are currently used for consenting only and they do not have any other function; therefore, it has been suggested that they could be used for other purposes too, such as accessing clinics and schedules. As well as that, there is a very small 'refresh' icon which is very helpful when checking if the results are back, but currently it's small and tucked away. Additionally, staff members also mentioned that the system logs out too quickly whilst doing clinical examination or a procedure, and does not allow the referral window to stay open, requiring to open it up multiple times. Furthermore, every requested test asks for the authorising consultant to authorise it, even if you are the consultant requesting it, which seems illogical. Lastly, the ability for medical students to help input information is very helpful and it would be great if their access to the system could be expanded to allow them to add allergies and problem lists in addition to medications.

4. Discussion

The NHS Long Term Plan requires digitalised hospital records by 2024 [42]. Additionally, European Union announced their plans to digitise health records in all member states by 2025 [43], African Health Organisation announced their digitisation target which is to be achieved by 2030 [44] and numerous countries in Asia are in the process of transitioning to computerised systems [45,46]. Therefore, as other trusts move to electronic systems, it's important to understand the issues previous trusts encountered, to make every transition smoother than the last one. A number of hospitals which have previously undergone similar transitions reported a fall in group morale which resulted in staff illness and absence [47], strengthening the argument for monitoring the change. The responses from this study highlighted an obvious drop in motivation and morale – '' … *feeling tired at times''; "I dread coming in to chaos everyday''* and the transition did result in some members of staff requiring to take sick leave due to stress.

Despite the benefits of moving to an electronic system, a number of transitional issues were identified, which are supported by previous publications on the subject [2,4,6,8]. The main problems include a change in staff morale as well as lack of training and education about the new system. Staff members involved in this survey reported that the transition was a difficult process. Previous studies carried out for similar transitions, confirm that staff must be able to use the new system to ensure they can fulfil their job roles [8]. Unfortunately, initially there were some hiccups with staff being given the wrong level of access or being registered inaccurately – '' *I'm still not able to sign off patients as myself as I have been entered incorrectly into the system''.* This study also identified that staff did not feel sufficiently trained in the system, which is another major flaw in the transition so far –'*Training has been really inadequate''.* Hartley (2010) mentions that the transition must be a team effort including all members of staff; however, OPD nurses were not given the

Table 3
Navigating the Transition and Evolving Perceptions.

Codes	Sub-themes	Themes
Overall I am looking forward to it but it will be a difficult few months	Positive anticipation	Anticipation and outlook
Once we have more understanding on how to use Epic I'm sure all aspects will be better than paper notes		
I have learnt more about EPIC whilst using it and brainstorming with my colleagues	Concerns and uncertainty	
Entering the unknown		
Hopefully clinics/admin will be more organised and efficient	Improved efficiency	Efficiency and organisation
Wouldn't go back - far too reliant on some aspects of EPIC by now.		
Technical glitches that will inevitably occur; it's going to be a nightmare!	Technical challenges	
Just as you think it's all falling into place you find that you can't do something, and you cannot work out why!		
EPIC logs you out too quickly		
It would be good for the EPIC technicians to revisit the department 6 months on to tweak the system and answer any questions we now have about EPIC		
Make refresh icon bigger/more prominent		
Would be good if Epic allowed 2 windows open at the same time so the referral letter doesn't have to keep closing down and reopen		
Multifunctional Ipads. What is the need for 3 Ipads for consenting, use them to access epic for notes!	Technology integration	
Tasks needs authorising too many times	Task management	
Resistance from staff who are resistant to change; some patients believe it is the start of the American takeover of the NHS!	Resistance to change	Staff and patient perspectives
There needs to be some local or cross-training/additional access so that clinicians, nurses and admins can help each other more.	Collaborative support and training	
Students can add medications, do orders and put in visit diagnoses in outpatients, but can't add allergies or problem lists which would be helpful		

opportunity to use the system for the first three months [3]. Nurses in the department made comments, such as "It's a working nightmare!'' and "I dread coming in to chaos everyday'' which highlights the toll on their morale. The issue with nursing staff not having access to the system from the start meant that the clinicians were experimenting and progressing with the system, but the nurses were not able to help nor try it for themselves - *"I loved being a part of the team and feeling relevant. I'm feeling like I'm at the outside of the team now, feeling redundant and useless''*. This highlights the need to ensure all members of staff have access to the system at the same time, allowing for everyone to feel useful and help each other.

McCarthy (2010) notes that hospital staff can be at differing levels when it comes to stages in life, ease with computer systems, comfort with change and job satisfaction [48]. These factors will affect the ability to adapt to new EHR, and this has been mentioned in a comment during the study - *"Staff who aren't computer literate can feel less motivated"*. Munck (2001) mentioned that organisational change is a challenge, as people tend to hold on to familiar things even when improved alternatives are available [49], which this survey also highlighted - *"It will create chaos''*. Therefore, the feelings of all staff must be taken into account to create a better working and learning environment. Lastly, McGinn et all (2011) carried out an extensive literature review and noted that resistance to change was a pertinent problem during the transition from paper to EHR [5]. The consultation confirmed this, thus highlighting the importance of monitoring staff morale - *"Resistance from staff who are resistant to change"*.

Nevertheless, many positive aspects of the new system were mentioned – *"I have wanted this sort of thing for years!"*; *"Endless capabilities''*; *"The system is working better than I expected"*. The electronic system brings a number of improvements which were also noted in comments– *"remote access, photos''*; *"being able to visualise obs in real time"*; *"live secure chat with colleagues about a patient"*; *"quick consent''* and *'' making being 2nd on-call much easier with the ability to know how busy the SHO's are and if they might need a second pair of hands''*. Lastly, a comment made by one of the staff shows the positive feeling towards the system's capabilities and the future – *'' I think it has the potential to be really fantastic. It will change the health service for the better once the smoke has cleared and everyone is OK with its functionality and how it works within their own speciality''*.

Finally, valuable suggestions for future trusts and hospitals undergoing this transition were proposed. Cross-training among staff roles would be helpful to facilitate issue resolution through collaborative support. It is recommended that system technicians revisit the department post-launch to optimise the system and address any queries. To enhance efficiency, iPads, currently used solely for consenting, could be utilised for other purposes like accessing clinics and schedules. Improvements such as a larger and more accessible 'refresh' icon and extended login times during clinical activities were suggested. Additionally, streamlining the authorisation process for requested tests, especially when the consultant is the requester, is deemed essential. Lastly, expanding medical students' access to add allergies and problem lists, in addition to medications, would be beneficial.

The findings of this study will be communicated through a multifaceted dissemination strategy. This involves publication of research outcomes in peer-reviewed journals, as well as the presentation of research findings at departmental and hospital meetings. Furthermore, these findings will serve as a focal point for discussions at hospitals within the United Kingdom that are currently in the process of implementing EHR. Additionally, our research will be presented at nationwide conferences, where the results will be shared via both poster and oral presentations.

4.1. Limitations

The study lead, author and data collector was known by the stakeholders and worked in the same department. This could have introduced interviewer and social desirability bias, where due to the familiarity of the interviewer to the interviewees, the answers are distorted by the interviewee to produce a more favourable response [50]. It plays an important role when the topic can be perceived as embarrassing, and this study uncovered that many members of staff were uncomfortable with the change and new technologies. Furthermore, as the lead was also affected by this transition, the analysis might have been affected by bias; which is why the responses were reviewed by 2 other authors separately, both working in the same department. The comments and codes produced by this consultation achieved a level of saturation which was evident in the analysis; however, due to the small respondent number, the data had reduced credibility and transferability.

Despite the above-mentioned limitations, this study uncovered important issues regarding the transition and has provided insight into staff feelings towards the change as well as positive and negative aspects of EHR.

4.2. Conclusion

Organisational change is a significant burden to staff, which this study has confirmed. Useful suggestions for future transitions were mentioned, including improved cross-role training, involvement in the departmental set-up and optimisation of the software. The authors hope that these discoveries will be applied to the future transitions from paper to EHR in order to optimise the change and ensure smooth conversion.

Data availability statement

Data included in article/supplementary material/referenced in article.

CRediT authorship contribution statement

Gabriele Baniulyte: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration,

Writing – original draft, Writing – review & editing. **Norma Rogerson:** Conceptualization, Methodology, Resources, Supervision, Writing – review & editing. **John Bowden:** Conceptualization, Methodology, Resources, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2023.e20645.

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