Medical and Nursing Staff Perspectives on an Electronic Health Record Implementation in Hospital Outpatient Departments

A Qualitative Study in Four English Hospital Trusts

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Abstract: Objective: The authors sought to investigate the attitude of the staff using computers in outpatient departments and whether their perceptions altered as a result of the NHS Care Record Service (CRS) implementation. Design: Qualitative study using semi-structured interviews and observations. Participants: A total of 70 interviews were undertaken representing a broad range of staff involved in the outpatient department including doctors, nurses, managers, medical records staff, clerks and IT staff. In addition, 361 hours of observations were carried out in the outpatient departments over a six week period. Setting: UK Results: This study highlighted the dependence that outpatient department staff placed on IT and the complexity of issues surrounding their use of computer systems. All outpatient staff used a computer to some degree in their work and were relatively computer literate but recognised that there were problems with the technology such as the length of time it took to get information from the system, the number of times it crashed and the lack of interoperability between different systems. The implementation of the NHS in one trust created additional problems for the outpatient staff, especially during the rather protracted bedding-in time. As the software was more complex than the previous system, it required a greater number of clicks to find the information needed. The added scale and complexity of the NHS CRS was perceived to have resulted in an overall slower system, with problems finding relevant patient information on the screen. The clinic booking system configuration created difficulties with double or triple booking of clinics or clinics cancelled. During this process, staff did not feel that senior managers were listening to their concerns. Conclusions: The outpatient department has different and unique requirements which must be considered during the development stage of any new electronic health record system. IT development processes must acknowledge that new software systems require a degree of maturity and undergo testing in the different departments prior to the implementation process. Staff need to feel part of the software implementation process and their problems addressed to reduce stress and anxiety. The software design flaws described decreased the acceptance of the NHS CRS by staff but it is important to recognise that staff opinions and views may change over time as the system becomes embedded and matures.

1 INTRODUCTION

Many hospital staff now use computers for at least a part of their work and the hospital outpatient department is no exception in being dependent on some IT. Outpatient departments provide care to enormous numbers of people and for most of those patients, it is their principal care providing department in the hospital. The number of patients seen is rising year on year; between 2008/09 and 2009/10, activity had risen 12% to 19,746,222 appointments. (Audit Commission, 2009)

There have been several studies exploring the barriers and frustrations associated with the implementation of the Electronic Health Record (EHR) in hospitals (Moody et al., 2004); (Dillon et al., 2005); (Scott et al., 2005); (Kossman, 2006); (Firth et al., 2008); (Holden, 2009); (Boonstra and Broekhuis, 2010) although few have concentrated on the outpatient department (Joos et al., 2006) or explored the attitudes of staff when confronted with a change over from a known computer system to a different one. Staff acceptance is now recognised as

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integral to the organisational change process and is considered crucial for any successful implementation of Information Technology (IT). (Miller and Sim, 2004); (Jensen and Aanestad, 2007)

This study was part of a larger programme of research to evaluate the implementation of the National Health Service Care Record Service (NHS CRS), the central plank of England's NHS' ambitious National Programme for Information Technology (NPfIT). The NPfIT sought to leverage the potential of IT to provide better quality, safer and sustainable healthcare. (Robertson et al., 2011); (Robertson et al., 2012) The key aim of the Programme was to replace paper records with life-detailed digital records, which can be shared across healthcare organisations. (Robertson et al., 2010); (Cresswell et al., 2011); (Sheikh et al., 2011).

In the context of undertaking the wider evaluation of the implementation and adoption of the NHS CRS, (Sheikh et al., 2011) we sought to (i) explore the completeness of medical records in the outpatient department (forthcoming separate paper), and (ii) investigate the attitude of the staff to using computers in the outpatient department, and whether their perceptions altered as a result of this implementation.

2 METHODS

The qualitative study was undertaken at four English trusts, which had expressed an interest in implementing NHS CRS, and it encompassed eight hospital outpatient departments.

2.1 Data Collection and Analysis

Data collection took place in the outpatient departments of participating trusts between May 2010 and December 2010. If a trust had more than one hospital site, then the main (adult) outpatient departments were selected.

Semi-structured interviews were undertaken with a range of key stakeholders who were purposively sampled and included doctors, managers, nurses, IT staff and clerical staff. Interviews ranged in length from five minutes to an hour, were audiotaped (with permission), and transcribed verbatim. An information sheet explaining the purpose of the study and a consent form were supplied to all participating staff. The researcher also undertook observations and took field notes in the outpatient departments.

Interview transcripts were imported into NVIVO 9, a data analysis and visualization tool designed to assist with qualitative analysis (Bazeley, 2007) where they were coded and then thematically analysed. Major themes common to different groups of interviewees were identified and explanations built for recurring patterns and associations.

Because of substantial delays in the implementation of the NHS CRS, only one trust actually implemented the outpatient department software module and the researcher was able to obtain the perspectives of staff five months after the implementation of the system.

3 RESULTS

Seventy interviews in total were undertaken and, in addition, 361 observation hours were carried out over a six week period.

Whilst staff understood that the computer system was a tool to improve the outpatient department work-flow and assist them in their work routine, those interviewed frequently expressed frustration in the problems they faced with using the computer. This section will highlight the key issues that impacted on staff in all four trusts using their current computer systems. It will then explore the effects of the implementation of the NHS CRS in the outpatient department of the one trust that deployed the new system.

3.1. Staff Perception of Their Current Systems

All the hospitals in this study already used a computer for one or more processes and, in general, the outpatient staff considered themselves computer literate. However, paper-based medical records still dominated in all four trusts and the lack of interoperability between different software systems meant that patient information was accessed only via several different and separate systems. Frequently, this resulted in all computer based information being printed out and placed in the medical record when preparing each clinic.

Many staff complained that, at times, the system was unreliable. In one trust, the computer was known to freeze suddenly which was not only frustrating for the staff, but had the potential to disrupt the clinician-patient consultation. The staff expressed exasperation when the system failed and crashed, as '*everything is dependent on your PAS system'* (Interview8). Staff also complained that the

systems, at times, were '*frustratingly slow*' (Interview15).

3.2 Following Implementation of the New System

During the course of the research study, one trust implemented elements of the NHS CRS which included the outpatient department module. This section will briefly examine some of the issues that staff in the outpatient departments experienced when confronted with changing over from one computer system that was well established to a newer and more complex one. Initially, the staff had been positive about the changeover to the NHS CRS but the software problems affected their attitude and confidence in the new system. One manager spoke for others stating '*the trust has lost a big opportunity in terms of capturing the moment.*' (Interview51). Whilst not every person was negative, there was little praise for the new system '*I think the principle's a good idea […] but I just don't feel as confident as I once did.*' (Interview50)

3.2.1 Training

Whilst some staff believed that the training they had received had been adequate, others felt it has been too soon and did not help them with what they needed to know.

The staff required crib sheets and step-by-step guides but at the time few were available. Within each outpatient department, the staff tended to support each other through the difficult period following go live. As one nurse explained '*if somebody finds something out they actually all tell each other and they'll actually work together.*' (Interview44) This support structure enabled many to carry on despite the stressful situation they were faced with during the implementation period.

3.2.2 Issues with the New System

This new system was considered even slower than the previous one, it crashed frequently and took so long to retrieve information. Staff complained that the complexity of the system challenged their work processes and that interoperability between systems remained a problem. More clicks were needed to retrieve the desired information which was then difficult to view, '*the screens are badly laid out, the data is badly laid out across the tabs on the screen*' (Interview56). In addition, the terminology on the new system was changed for common clinic expressions such as '*peg board*' instead of '*screen*' and '*withdrawn*' instead of '*cancelled*' causing further confusion for staff.

3.2.3 Clinic Booking Information

Fundamental to the outpatient department is an efficient booking system for outpatient appointments. The configuration of the new system meant that the staff who booked the clinic saw different information to the outpatient department staff. This created confusion, sometimes resulting in patients arriving for clinics that did not exist or clinics being double or treble booked with all patients arriving at the same time or no patients arriving for a clinic.

3.2.4 Senior Management Support

Staff in the outpatient department tried to alert senior management of the problems they were having but they felt that no one was listening to them, '*nobody seems to be hearing us so we're either not speaking the same language, we're speaking a foreign language, or we're not being heard for a reason*' (Interview47).

3.2.5 Professionalism Attacked

As a consequence staff felt that their professionalism was being attacked, '*We were trying desperately hard to keep the clinics running, get the patients seen, be there with the patients whilst they're being examined and being seen and we can't do that if we're chasing round after […] a computer system that won't deliver what we're looking for*' (Interview47).

3.2.6 Safety Issues

With the implementation of the NHS CRS some of the clinical staff expressed concern that the confusion with the new system created potentially unsafe issues for the patients. As one nurse said, '*safety mistakes are being made which weren't before,'* (Interview49).

One of the consultants also complained that he was very concerned about the safety aspect of the new system, '*The system is not working to some safe way and we have to find ways around it to make things safe*' (Interview42).

4 DISCUSSION

4.1 Main Findings

This study highlighted the dependence outpatient department staff placed on IT and the complexity of issues surrounding the use of computer systems. Whilst papers have studied clinicians' attitudes relating to the implementation of software, (Dillon et al., 2005); (Whittaker et al., 2009) few studies have explored the practical problems experienced by the staff (Boonstra and Broekhuis, 2010) during any implementation period.

All outpatient staff expressed frustration that the poorly designed software often impacted negatively on their workload and this decreased the acceptance of the NHS CRS by staff. They raised concerns about (i) the length of time it took to get information from the system, (ii) the number of times it crashed and (iii) the lack of interoperability between different systems.

Staff found that they had to alter their work practices, rather than the technology fitting into their work processes (Cresswell et al., 2012). According to Buntin, (2011) the human element is crucial to a successful software implementation. Although staff in this study appeared willing to embrace the new system, the implementation process brought with it a number of challenges altered their attitude to the new system.

5 STRENGTHS AND LIMITATIONS

One of the main strengths of this study was the large number of different staff involved, who provided a wealth of information and knowledge about the practices and procedures undertaken in each trust. Data was collected across a number of different speciality outpatient departments, thus providing a more complete picture in the different research sites. This helped to provide a comprehensive picture of the issues staff faced when using the hospital electronic systems.

The main limitation to this research was that the implementation of the new NHS CRS took place in only one trust, this being due to the well-publicised delays in the NPfIT. The lack of benefits may have been unique to the site as the trust was still undergoing a transitional period of implementation. It is therefore important to recognise that staff opinions and views may change over time as the system becomes embedded.

6 CONCLUSIONS

Staff expressed their frustration that computer systems did not assist the effective running of the clinics. The implementation of the new computer system in the one trust studied appeared to cause additional delays and problems for the staff in the outpatient department and placed extra stress on them.

Sheikh et al (2011) acknowledged how the political pressure to implement the NHS CRS meant timelines were rushed and therefore software was implemented prematurely. A greater maturity of the new system may have prevented some of the problems experienced by staff at this trust.

Many of the issues raised here have been mirrored in other studies (Kossman, 2006); (Boonstra and Broekhuis, 2010) thus demonstrating the importance of learning from previous implementations. Jensen and Aanestad (2007) stated whilst the benefits to EHR can be considerable, the implementation of any new system can be erratic especially when the system fails to meet the need of the healthcare professionals. This study complements those results and highlights that with any major change in software, staff need to be involved throughout the process.

The outpatient department has different and unique requirements which must be considered during the development stage. It is essential that there are adequate test runs prior to any major implementation to identify potential problems and, if necessary, the software not implemented until all such problems are satisfactorily dealt with. Should any occur during the initial stages of implementation then they must be given top priority for development.

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