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Western Australian radiology departments' views on Australian Personally Controlled Electronic Health Record

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Abstract

Introduction: Since the last decade, many countries have started developing a national electronic health record (EHR). The national EHR in Australia is called Personally Controlled Electronic Health Record (PCEHR). It has been available for use since 1 July 2012. A federal government's review of its implementation was conducted in late 2013 because it failed to meet the set targets. The purpose of this study was to investigate Western Australian radiology departments' views on the PCEHR complementary to the government's review report.

Methods: Chief medical imaging technologists (n=18) and picture archiving and communication system (PACS) administrators (n=18) from public and private hospitals in Western Australian were invited to participate in this study in May 2014. The response rate for participation was 22.2 percent (8/36). Semi-structured interviews were conducted with the participants to obtain their perceptions of PCEHR. The interviews were analysed inductively and thematically.

Results: There were eight people (n=8) who agreed to participate. They believed the PCEHR would enhance efficiency and effectiveness of healthcare services if barriers to its implementation were addressed. The major barriers identified were concern of individual privacy, increase of staff workload, inadequate system functionalities and training, lack of involvement of stakeholders and money. The use of Medicare to provide both positive and negative incentives to the stakeholders was suggested as a viable solution to address the current barriers.

Conclusion: This study investigated four Western Australian radiology departments' perceptions of PCEHR. Although their perceptions were similar to the ideas in the government's review report in general, new insights were also provided by the participants. These findings could potentially complement the government's review.

Keywords

Australia, electronic health record, radiology.

Introduction

According to the World Health Organization,[1] an electronic health record (EHR) is an electronic collection of personal health information of individuals over their lifetime. This allows information to be entered and accessed by multiple healthcare providers. Since the last decade, countries such as Canada,[2] the United States (US),[3] the United Kingdom (UK),[4] and Australia,[5] have commenced developing a national EHR.[6] In Canada, the federal government funded, not-for-profit organisation, Infoway is responsible to oversee the implementation of EHR in each jurisdiction. The ultimate goal is the establishment of a national EHR. To ensure this goal can be achieved, Infoway only funds project proposals submitted by those jurisdictions that can demonstrate compatibility and interoperability for the nationwide integration in the future.[2] Similarly, the EHR compatibility and interoperability are valued in the US. The US Centers for Medicare and Medicaid Services implemented the meaningful use (MU) programme to provide incentives to healthcare providers to adopt certified EHR technology before 1 October 2014. However, a penalty was to be applied if a practice did not adopt the technology from 2015.[7] This arrangement is expected to facilitate the US moving towards a national EHR.[8] Unlike Canada and the US, the UK approach to national EHR was top-down.[4,9] Their National Health Service Connecting for Health of the Department of Health was responsible to establish a standardised national EHR. A 'replace all' approach, rather than connecting existing systems, was used.[4] This programme was considered an enormous disaster and was discontinued in 2013.[10]

The Australian federal government utilises a top-down (rather than middle-out or bottom-up) approach to develop the national EHR. The National Electronic Health Transition Authority (NEHTA) was formed to establish the national EHR system: the Personally Controlled Electronic Health Record (PCEHR). This system has been available for use in Australia since 1 July 2012. The PCEHR allows not only registered healthcare providers to enter and access health information of individuals with PCEHR accounts, but also allows individuals to provide additional health records and to decide which parties can access their records. As in the UK, the PCEHR failed to meet the set targets, for example, the numbers of registrations. A panel was formed by the Australian federal government to review the PCEHR implementation in late 2013.[5] The review report was released in May 2014.[11] Although this review was comprehensive, and included comments from major organisations at a national level, such as the Royal Australian and New Zealand College of Radiologists, a study to investigate the views of local radiology departments was deemed to be important.[4] The purpose of this study was to investigate the Western Australian (WA) radiology departments' views on the PCEHR complementary to the Australian federal government's review report. As the development of national EHR in other countries is still ongoing, outcomes of this study could also be applied to their development.

Methods

Chief medical imaging technologists (MITs), and picture archiving and communication system (PACS) administrators, from public and private hospitals in the WA metropolitan area were invited to participate in this study in May 2014. A total of 18 hospitals were invited to participate in the study. The chief MITs (n=18) and PACS administrators (n=18) were selected as the target population because they were considered to be the imaging informatics stakeholders in the radiology departments and would be able to provide useful views on the PCEHR from the respective radiology department's perspective.[12] All potential participants were informed that participation in this study was voluntary, and that they could withdraw at any stage. They were also informed that participation would require them to sign an informed consent form. This study was approved by the Curtin University Human Research Ethics Committee (Approval Number SCI-16-14).

Literature review of other EHR studies revealed that a semi-structured interview seemed to be one of the preferred data collection approaches used to investigate this topic area.[13] To test the research tool, pilot interviews were conducted with six MITs to validate the questions in the interview guide. This allowed the interviewers to amend and correct the interview questions where relevant.

Eight of the 36 invited imaging informatics stakeholders agreed to participate in the study; four chief MITs and four PACS administrators. This was a response rate of 22 percent (8/36). A semi-structured face-to-face interview was then conducted with each of them (n=8) by two trained interviewers (researchers).[4,13] An interview guide was developed based on the common themes from relevant literature including benefits, barriers and solutions of EHR implementation.[8,14-16] The interviews were recorded using a digital voice recorder.[4]

Each interview was transcribed by one of the interviewers. The transcript was reviewed for accuracy by the other interviewer. Each transcript was then made available to the corresponding interviewee to check for content accuracy. The interviews were analysed inductively and thematically. All transcripts were read and responses were coded independently by individual researchers. Similar recur-

ring ideas were grouped into themes. The themes were categorised subsequently. All researchers met regularly to discuss the themes and categories established until consensus was reached.[16]

Results

Four chief MITs and four PACS administrators from four radiology departments of major public hospitals in WA were interviewed. Their views on the PCEHR are presented below and are summarised in Figure 1. Verbatim comments of the participants are stated in italics.

• PCEHR benefits

It was perceived that the PCEHR would be able to provide secure, lifetime health records of individuals, including radiology reports and images that would be available to multiple authorised users anywhere, anytime. This would eliminate redundant medical procedures thus leading to cost savings and healthcare quality improvements such as efficient services, radiation dose reduction, and better diagnosis through image comparison, provided that the barriers to PCEHR implementation are addressed.

"I think having access to getting the results timely from the patient with their consent for the radiologist especially to review the images or even when to compare with previous imaging or even when patient comes from an external site through ED [emergency department] for example there's not duplication again and not a waste of time to ring around to find the right images and get them sent. So I think it will save money again because time is money" (Chief MIT, Department A).

"I think it would be successful if done properly" (PACS Administrator, Department B).

"Would an eHealth record [PCEHR] benefit the country? Absolutely. Will it succeed in its current format? Absolutely not" (Chief MIT, Department B).

• Barriers to PCEHR successful implementation

One of the major barriers to successful implementation that was suggested, was the concern of privacy of individuals.

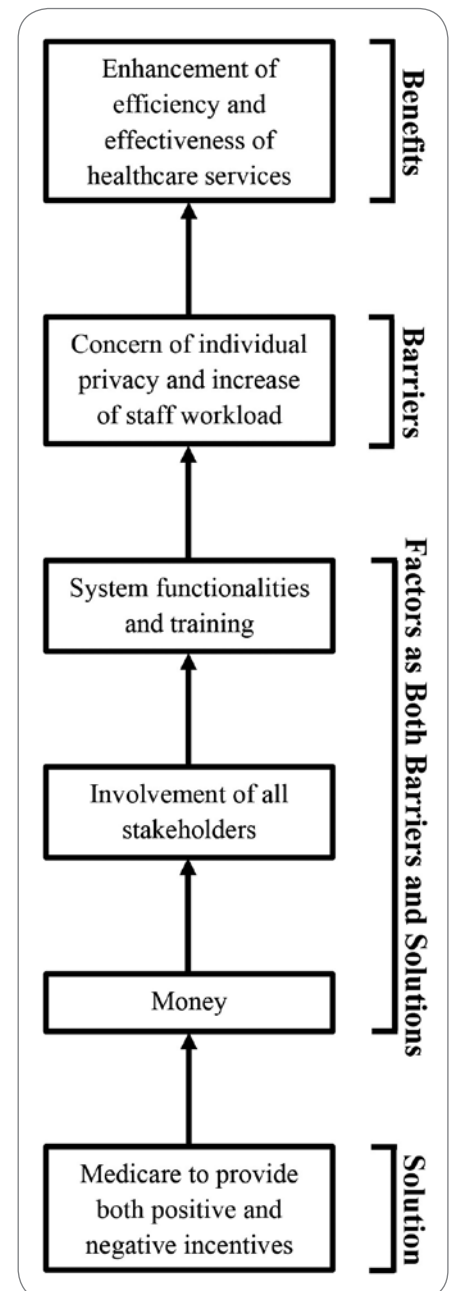*"…'I don't particularly want the receptionist at my local GP [general practitioner] who might actually live*

Figure 1. Summary of participants' views on Personally Controlled Electronic Health Record.

in the same street as me to kinda know that you know … I've got infertility issues or something like that.' … I'm sure there's [re] different levels of accessibility like there is with PACS … But it's still, they can still know your medical history" (Chief MIT, Department C).

"Privacy is a huge issue as well, I think" (Chief MIT, Department D).

Another barrier identified was the increase of healthcare professionals' workload.

"So like a private company wants this country patient's images but PACS is

the middle man for public so it's got to get pushed to the public server and then go through public over to the private … You will still be the middle man … There will probably be a larger workload" (PACS Administrator, Department A).

"The issue with that is being able to maintain that. You would need an army of administrators taking care of that system as opposed to the small amount we have here. It would [be] quite expensive to maintain" (PACS Administrator, Department B).

• Factors identified as both barriers and solutions

Although the privacy and workload issues were identified as the major barriers, solutions for these were also suggested. The PCEHR could be successfully implemented by connecting all existing health information systems through the use of unique identifiers of individuals and established standards, and based on vendor neutral archive (VNA) and cloud computing technologies. All stakeholders including individuals / patients, healthcare professionals and providers from public and private sectors, and professional and government organisations at state, territory and national levels should contribute towards the development of PCEHR. In this way, the functionalities and performances of the PCEHR would be able to meet their needs such as consent giving, process automation and simplification, effortless maintenance and establishment, robust and secure platform, and adequate data storage space and transmission speed. Training and education should also be provided to the relevant stakeholders.

"I think the main thing is if it can be set up properly, involving radiology and IT [information technology] and all the different stakeholders, it will reduce time for the PACS guys from ringing around trying to get images onto PACS because they won't need to do that. It will just come down to having a look online when required. I guess there will need to be some kind of management course. When things go wrong, how are you going to deal with those things. Timewise, it might overall actually be the same" (Chief MIT, Department A).

"… To get these things to talk to one another, well, I think it all comes down to HL7 [health level 7]. We are

[have] our product HL7 … So this is where it gets back to the consent part, so getting patient's consent and somehow putting that into the system. So then only those patients who have given their consent, the report will be automatically sent to this eHealth [PCEHR] thing. And also getting that unique number, because I think it's all based. You have to get that unique number from somewhere … Regarding access to the entire study, that is just huge … Or whether or not you have a link then on the report to link into a webpage, web-viewer for your PACS? Maybe" (PACS Administrator, Department C).

"Well what I know is that eHealth [PCEHR] is an initiative by the federal government to try to bring together all patient records, working towards a complete electronic health record … I don't know if it's a 'cloud' actually. I'm not sure. It probably is" (Chief MIT, Department C).

"The systems are there and in place. They just need to be brought together and you need a network that is willing and able to do it like a great big VNA that can put all this stuff on" (Chief MIT, Department B).

However, at the same time, these solutions were considered as the barriers to successful implementation as well.

"I doubt whether the private sector would be willing to put money into something that their competitors would also have access to … And basically the ultimate goal is how can this benefit my organisation and put me at a distinct advantage compared to my competitor" (Chief MIT, Department B).

"Really it's money and effort and getting the people behind it to push it forward" (PACS Administrator, Department D).

"Obviously when it does break you're going to have to learn how to fix a new programme. So someone is going to have to provide training. Who is going to provide that? Maybe the government? They never really provided PACS training" (PACS Administrator, Department A).

"OK, barriers - there's quite a few. So there's stakeholder buy in. And that's

probably fundamentally the patient … Often if you are somebody who is reasonably healthy most of your life, how relevant is the fact that I broke my arm ten years ago? ... Now a lot of the GPs [general practitioners] are not on eHealth [PCEHR] … Because sometimes GP practices don't have the mouse nor do they have the finances to deck themselves out with some decent computer equipment and maintain it and then get updates. And why would they do that when they are kinda working ok now? So there doesn't seem like there's enough in it for them. There's no a great buy in from them because they haven't been convinced yet" (Chief MIT, Department C).

Money was indicated as one of the main factors that would drive all the stakeholders to involve themselves in the PCEHR and contribute towards its successful implementation. Nonetheless, it was also perceived as the major barrier.

"The other barrier would be the cost. That would be a huge barrier. The cost, the ongoing cost and the projections for that … Well there's no money … That's the holdup" (Chief MIT, Department C).

• Solution for PCEHR successful implementation

It was suggested that changing the current PCEHR to an opt-out or mandatory system could help to address the financial barrier to some extent so as to ensure successful PCEHR implementation.

"… I think the government would need to invest a lot of time and money into selling the benefits to each individual user because they're going to be all different, public, private, radiology, radiographer … They aren't advertising it enough" (Chief MIT, Department A).

"And I guess the problem is that things like this everybody needs to be committed to it and if it takes longer, it costs more money and it's more difficult for people to do … You can bet your bottom dollar the government is not going to say 'right, you can have extra amount of FTE [full-time equivalent employees] to do it.' It's just something you would have to do. It'll be one more job" (Chief MIT, Department D).

"Make the default opt-out if not mandatory" (PACS Administrator, Department B).

"I mean it has to be compulsory. Otherwise it's a waste of resources and time and effort" (Chief MIT, Department B).

However, the feasibility of moving to the opt-out or mandatory system was also questioned due to potential political issues such as concern of individual privacy.

"Yeah, I think there are civil libertarians are onto this about how it's probably gonna go" (Chief MIT, Department C).

"It's just dumb. I could imagine how they reacted to this. I'm willing to bet the same people that came up with this are the ones saying 'don't make it mandatory and let it be patient controlled to avoid any privacy issues'" (Chief MIT, Department B).

"Whether it will ever become compulsory or opt-out, I doubt it. I think that sometimes in Australia, people are given too much choice. And I think sometimes we are not rigid enough and say 'right, this is what needs to happen and let's do it.' I mean it's a bit of a political hot potato. I guess a little bit, isn't it" (Chief MIT, Department D).

A more viable strategy was also proposed, which was to use incentives to encourage different stakeholders to become involved and contribute. In this way, the current opt-in, personally controlled element of PCEHR could be maintained addressing the potential political issues such as concern of individual privacy to some degree. It was further suggested that the incentive programme could be administered by Medicare (universal healthcare scheme in Australia). Furthermore, there could be a reduced rebate for those who did not register for PCEHR. This, in turn, would provide money to Medicare to fund the ongoing PCEHR development, but to some extent, still allow the stakeholders to choose.

"… maybe making an incentive to put the record on e-health [PCEHR]. Or if you have your e-health set up you get your [Medicare] rebate quicker or something" (Chief MIT, Department A).

"There are different ways you can do that. Government pays for all of radiology, so under Medicare. So even if you have your private health insurance, you can't claim your CT [computed tomography] scan (or whatever) on private health insurance. If I was the government, they could say 'ok, we will pay you 10% less for each item number and that money might go into a mutual archive which we will manage for the whole other country'" (PACS Administrator, Department D).

Discussion

The themes emerged from the interviews with the stakeholders of the radiology departments are, to some extent, similar to those raised in the Australian federal government's PCEHR review report. For example, both mentioned its potential to enhance efficiency and effectiveness of healthcare services, issues of individual privacy, healthcare professionals' workload, system functionalities, healthcare identifiers, training and funding supports, and solutions for these including involvement of all stakeholders, connecting existing systems, use of cloud computing technology and providing incentives such as money and quicker Medicare rebate.[5]

However, some unique aspects were noted in the interviews of this study. The PCEHR review panel recommended that the government should change the current PCEHR to an opt-out model as a way to address the adoption rate and financial barriers even though the use of positive incentives, such as quicker Medicare rebate, was considered.[5] The participants in this study also raised the use of the opt-out or mandatory model. Nonetheless, they doubted the feasibility of this model due to the potential political issues such as concern for individual privacy, and believed positive (e.g. reward money, quicker Medicare rebate, etc.) and negative incentives (e.g. reduced rebate, etc.) for the stakeholders should be used to address these barriers. This is because when comparing it to the opt-out situation, this opt-in, personally controlled setting could protect the stakeholders' right to privacy better. At the same time the negative incentives such as rebate reduction could provide Medicare with the money to fund the PCEHR's ongoing development (positive incentives) and encourage all stakeholders to participate.[3]

Although it is anticipated that the use of negative incentives could cause other political issues, it seems it would be a better solution to the financial barrier.[17] Similarly, a programme with the use of positive and negative incentives (i.e. MU programme) has been implemented in the US to encourage the stakeholders to contribute towards the national EHR development.[7] Apparently, the use of incentives would be a viable solution for PCEHR successful implementation.

The integration of existing systems in radiology departments with the PCEHR was recommended in the PCEHR review report. The report also acknowledged the difficulties related to the integration in general, such as the issues of different healthcare identifiers, workflow and data types used in radiology, but did suggest some solutions for these.[5] The participants in this study provided further insights into the integration. For example, they suggested that the use of cloud and VNA based technologies should be an effective solution for the integration. Their suggestion appears to align with the current development direction of medical imaging applications and EHR.[18,19] For instance, Langer et al[19] proposed a cloud-friendly VNA architecture that could potentially address the compatibility issue of heterogeneous medical imaging systems and reduce the number of times for image transmission by mounting the VNA file system on various radiology and clinical servers in the EHR environment. All the servers could provide links to medical image files stored within the VNA. In this way, the image files would not need to be sent to and stored within these servers. This, in turn, could address the connection, storage and security barriers to PCEHR implementation.

Two major limitations are noted in this study. One of these was the fact that there were only eight participants (n=8). However, in a recent study of electronic image data and medical record management, the same number of interviewees (n=8) were recruited.[20] It appears that this number of participants was considered to be adequate. The second limitation was that all participants came from the radiology departments of public hospitals in WA. A representative sample should include participants, from a range of radiology departments across Australia. This could be considered as the direction for further research. Nevertheless, the findings of our

study seem to be in line with those from the PCEHR review report generally. The trustworthiness of the results could be assured to some extent.[5]

Although there were limitations, this current study appears to be timely because the development of PCEHR is still ongoing.[21] The participants were also able to provide some insights into the PCEHR from a radiology department perspective. Such insights were not provided in the PCEHR review report.[5] The findings of this study could potentially complement the Australian federal government's review. For example, only positive incentives were mentioned in the government's report but our participants suggested the use of both positive and negative incentives should be a more effective solution for PCEHR successful implementation. Also, the government's review proposed

the adoption of cloud computing technology for the PCEHR development while a more specific direction, the use of cloud-based VNA, was identified in our study.

Conclusion

This study investigated four WA radiology departments' perceptions of PCEHR. The participants believed the PCEHR would enhance the efficiency and effectiveness of healthcare services if the barriers to its implementation were addressed properly. The major barriers identified were concern of individual privacy, increase of staff workload, inadequate system functionalities and training, lack of involvement of stakeholders and money. Although similar ideas were noted in the Australian federal government's PCEHR review report, new insights were also provided by the participants in this study. For example, the use

of Medicare to provide both positive and negative incentives to the stakeholders was suggested as an alternative to the opt-out model to address the current barriers. Technical solutions specific to radiology for information system integration were proposed as well. The findings of this study could potentially complement the Australian federal government's PCEHR review. As other countries are also developing their national EHR, it is expected that our experience might be useful for them to consider for successful implementation of their systems.

Acknowledgements

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