

Clinician assessments of workplace security training- an informatics perspective

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Abstract

This paper describes and analyses clinicians' assessments of workplace privacy and security (PaS) training in the context of contemporary health information system (HIS) practice. The PaS training underpins national e-health frameworks. The paper draws on findings from a forthcoming dissertation. The 'questerview' technique was applied to this case study of 26 clinicians in three Victorian (Australia) public hospitals. The technique relies on data collection that applies standardised questions and questionnaires during interviews. Respondents were recorded while they completed the standardised questions and questionnaires and were encouraged to discuss their responses to items in detail. Data analysis involved the scrutiny of 'questerview' transcripts to identify emergent themes. Responses to the standardised items led to rich sources of qualitative data. The majority of clinicians had attended workplace PaS training sessions. The sessions took a variety of forms including written handouts, system training and induction programs. Some clinicians were unaware of the training sessions or found them poorly implemented. Scheduling problems meant many clinicians found the sessions difficult to attend. Clinician feedback indicates that workplace PaS training sessions for HIS were poor. The sessions were not ongoing or related to clinical practice concerns and can best be summed up as 'irrelevant' to HIS practice. Irrelevant PaS training sessions hamper clinical confidence in HIS practice and the introduction of unified e-health records at national levels. The clinicians' feedback suggests a pressing need for further research and contextual reviews of HIS PaS training protocols nationally and across the globe.

Keywords: Informatics, information protection, information system, on-the-job training, privacy, questerview

1. Introduction

Information privacy and security (PaS) training sessions for clinicians are important foundations of an e-health framework. Australia is increasingly adopting a national e-health framework to improve standards of patient care. E-health refers to the electronic management and exchange of patient health information. It depends on private and secure health information systems (HISs), underpinned by information and communication technology (ICT), in clin-

ical settings [1]. Public hospitals support e-health frameworks in a variety of ways that include the provision of workplace HIS PaS training sessions for clinical staff. The training sessions are an essential part of applying ICT to shared patient information [2-4]. Therefore, an understanding of the efficacy of workplace PaS training sessions, in the context of HIS practice at the hospitals, could produce material of great value to the development of successful and productive national e-health frameworks.

A shared understanding of key-terms supports this study. Firstly, the

term 'informatics' centres on the application of computerised, new and emerging ICT for the management of health information [5]. Secondly, as is enshrined in legislation, the term 'privacy' concerns control over access to oneself and associated information, including health information, while 'security' refers to all measures that protect information privacy [6, 7]. Finally, the term Health Information System (HIS) describes the unified collection of different types of information systems used by clinicians in health services [8]. The terms, defined

here, are applied throughout the study.

Informatics literature about the application of ICT to secure private patient health information is scarce [3]. Most of the literature is hypothetical or anecdotal, or centres on the functionality of various clinical computer applications [9, 10]. The literature that does exist argues that PaS training for clinicians is needed to underpin e-health frameworks if they are to succeed. When clinicians do not feel confident in the frameworks, patient records can be overlooked, might not be updated as frequently as they ought or could be jotted down on paper for later transcription into e-health systems [9, 11]. The inefficient management of HISs can create errors and fragmentation of patient information, which then means that the information is unreliable for clinical work.

At the same time, other literature shows that appeals for informatics training sessions abound [3, 12-18]. Effective health informatics training frameworks to secure patient privacy are sorely needed during qualifying and post-qualifying education for clinicians [13, 17-19]. Nevertheless, most informatics literature focuses exclusively on ICT-based applications and devices for clinical care, rather than the security of HIS vis-à-vis patient privacy.

Professional associations, such as the General Practice Computing Group, offer non-specific advice, guidelines and checklists to Australian clinicians about securing HIS [3]. The advice is designed to help clinicians meet their ethical and legal responsibilities with regard to the security of private patient information. Contradictory laws and policies at state and federal levels have fostered widespread confusion about

ways to mitigate HIS security risks [9, 20]. The confusion ensures the generality of security advice that clinician associations are forced to provide.

If they existed, Australian standards might alleviate the confusion [9]. Standards document specifications against which a series of best practices for a process or technology can be measured [21]. Until a standard is ratified, *HB174:2003 Information security management - Implementation guide for the health sector* outlines practical HIS security measures [22]. *HB173:2003* acknowledges both the need for clinical informatics training borne out by the literature and the PaS information vacuum that clinician associations highlight [22]. The handbook, which provides a common information security management reference for the health sector, incorporates workplace PaS training for clinicians [22]. Thus, clinical feedback about the relevance of workplace PaS training, as specified in *HB173:2003* and reported in this study, may provide fundamental material to national e-health frameworks.

2. Methods

The aim of this study is to provide clinician feedback, in the practice context, about the implementation of workplace HIS PaS training sessions. As Australia joins other nations across the globe to pioneer unified e-HIS, authorities must understand the effect of clinical workplace PaS training policies and protocols. Therefore, research exploring the implementation of PaS from the clinicians' perspective is necessary and a qualitative, case-study, research

approach was appropriate for this study [23].

The case study method furnished a contextual explanation of clinicians' beliefs about HIS PaS training sessions. The method was appropriate to the study because it enabled us to ask 'how' and 'why' questions of clinicians in practice settings [24]. The case study provided a depth of understanding about a subject that has received little previous investigation while laying the groundwork for good quantitative research in the future [23].

Case study participants were drawn from a purposive sample of allied health workers, nurses and doctors, who worked with HIS PaS to provide patient care at public hospitals in Victoria (Australia). Participants were recruited from hospitals in rural, urban and rural-urban fringe locations. After human ethics clearance, hospital unit managers passed on recruitment material for the study during regular meetings with groups of clinicians. Twenty-six participants, nine medical, eight nursing and nine allied health clinicians, volunteered to participate.

The study relied on the 'questerview' technique to gather participant feedback during interviews. 'Questerviews' apply standardised questions and questionnaires during qualitative data collection, combining qualitative and quantitative research methods [25]. Participants did not see questions before the interviews and interviewee responses were tape-recorded by the researcher. Some questions were structured, ostensibly to obtain closed answers during interviews, while the semi-structured questionnaire facilitated open answers.

SECTION A
Are the information system security measures listed below used in this organisation?

1. Training that defines private/confidential information classifications?
Yes No Don't know

2. Training that focuses on how to protect privacy and security of information
Yes No Don't know

SECTION B
1. Do the following security measures affect your workflow, if at all?
...Training that defines private/confidential information classifications.
Yes No Don't know

2. If the measures affect your workflow, briefly describe the affect (with reference to clinical examples).

Figure 1. Privacy and security training - Extract from the research instrument

Structured questions were interspersed with semi-structured questions throughout the interviews, as illustrated in *Figure 1 Privacy and security training - Extract from the research instrument*. Question topics were based on controls operationalising *HB174:2003*. Ten controls are outlined in *HB174:2003* and incorporate, for example, communications and operations management, access control, information security policies and personnel security controls [22]. *Figure 1* draws on the training sections of an instrument used to collect data for a larger research study. The larger study is described in a forthcoming dissertation analysing the way clinicians work with HIS PaS to provide patient care.

In all interviews, during the administration of structured questions, the researcher did not explain terms to participants but repeated them if required. Participants read structured questions and were encouraged to speak out the reasoning for responses they gave to these questions [25].

Throughout the semi-structured questionnaire, informed by responses to structured questions, the researcher explored participants' perceptions and anecdotes of workplace HIS PaS training sessions. On the completion of the instrument, the researcher picked up on specific issues in some detail. Each interview was digitally recorded so that no important feedback would be lost.

Data analysis methods took two basic forms. Firstly, recorded interviews were transcribed. The transcripts were repeatedly scrutinised, using nVivo computer software, to extrapolate codes. Relevant themes and issues emerged from the data to guide the coding. Secondly, the coded segments were placed into separate files and analysed to facilitate a detailed understanding of the context and processes related to the training sessions. Data analysis was inductive and iterative, exploring the tacit or implicit PaS workplace training experiences of the clinicians [23]. Participant responses led to rich sources of

qualitative data which facilitate an understanding of the implementation of PaS in clinical practice in Victorian public hospitals.

3. Findings

3.1. The occurrence of workplace training

This section gives an account of participant views regarding whether or not clinicians attended workplace PaS training at the hospitals and is illustrated in Table 1. The table shows participant feedback to structured questions in the *General response* column while *Illustrative comments* are drawn from the semi-structured questionnaire. The structured questions, outlined in Section A of Figure 1 (above), did not work well during interviews. Most clinicians did not understand the distinction between training to define private or confidential information classifications and training that focuses on how to pro-

tect private information, so the table conflates their responses.

General response	#Illustrative comment	*No. of responses
Yes	Yeah.	19
Yes, but it is unsatisfactory	It's poorly done.	10
No	I'd say no.	6
Yes, in written form.	They [hospital management] attach everything to your pay slip ... which is then your responsibility to read and take in.	5
Yes, it is an induction process.	We do it [train clinicians] during orientation [for new staff].	5
Yes, but scheduling is a problem.	It's really difficult [to organise].	5
Yes, but it is not useful.	Repetitive, it's [the training] boring and inconvenient.	3
Yes, though it isn't timely	... everyone had forgotten the training [for a new HIS system] where it should have occurred before and then ongoing...	3
Uncertain	I think we're getting training on how to protect privacy.	2
Yes, a little.	We probably haven't really gone through a lot of that.	2
Unknown	I don't know if we have them [training courses].	1

Table 1. A summary of clinical views about whether workplace training on the privacy and security of patient information had occurred. *The responses of some participants appear more than once # The illustrative comment column uses participant interview quotes.

The table demonstrates that the majority of participants, nineteen, had attended hospital training about the PaS of patient information. One participant did not know whether he had attended the sessions. A further six participants commented that they had not ever participated in workplace training sessions about how to protect the PaS of patient information. One clinician, a doctor, gave a possible explanation as to why some clinicians did not receive the workplace training. He spoke of problems training highly specialised doctors in private practice at the hospitals because they are not part of the public health system. He said: *“There’s considerable difficulty and to a degree, some reluctance, because of scarce resources, to put in and get engagement for much [PaS] training [for specialised clinicians]”*.

3.2. Scheduling

Scheduling workplace PaS training sessions was a major problem noticed by five of the nineteen trained participants. One participant, a clinician-manager, commented on his experience of scheduling the training sessions. He said: *“We’re a 24/7 department here. I’m lucky if I can get a third of my staff to attend any meetings, so it’s really difficult to set out any [PaS] information. Another clinician-manager commented too. She said: Yeah, it’s just that we’ve got to get staff off a rostered shift you know ... it’s really hard getting them [clinicians] all off because you’ve got to get them off in big groups. Still another clinician summed up the majority of participant views on this topic. She said: It’s just the fact that the training, most of the time, is off the ward and*

... we have casuals, part-timers and full-timers, and a lot of people who are part-time don’t start until 2 o’clock and so they have to come in for the training and you have to go down off the ward and then everything gets mucked up...”

3.3. Delivery mechanisms

Although most clinicians had been trained to protect the PaS of information, Table 1 shows that orientation or induction programs were the delivery mechanism for five of the nineteen. A participant described the typical process. She said *“... they [hospital authorities] go through it [PaS training concepts] in your orientation, you know ... your responsibilities in terms of information that can be given out ... it’s just part of an induction I guess.”* Another clinician commented that *“... it all comes with your initial training”*. Still another comment

probably sums up relevant clinician feedback. The participant said: *“Training? It’s just done through our HR department. No big deal and we do it, we do it in group form and we do it during orientation. New staff members will go through a full orientation at some stage and they deal with confidentiality and so on.”*

Five participants, as shown in Table 1, were trained about the security and privacy of clinical information via written communication. Two of these commented that the training information was nested in the contracts they signed when initially employed. One clinician said: *“It’s [PaS training] been a written format ... you sign a contract when you first come into the position.”* Another clinician was trained by way of her salary advice. She said *“We got a four or five page document that was attached to ... our payslips.”* Finally, still another participant described the experience of two clinicians when he explained that his training was via the circulation of a hospital booklet. He explained: *“Look we all got a copy of the book the ‘Privacy Principles’”.*

The third kind of delivery mechanism that participants mentioned centred on HIS training sessions. Some participants commented that PaS training sessions are embedded in training for new e-health systems. One of these participants said: *New staff [to the department] that come in when they’re having ... computer training ... are given the appropriate [PaS] information.* Another participant had similar experience with PaS training sessions for e-health. He said: *“Homer [a computerised HIS] training was given maybe six weeks prior to the system being entered and then what happened is it came in and everyone has forgotten the [PaS] training, where it should’ve occurred before and then ongoing after...”* Still another participant commented on e-health application training. She said: *“... if you need [ongoing, contextual PaS] training, like up here [at the hospital campus], finding someone who, we have people who are trained with Concerto [a suite of e-HIS] and that, who come out and do training,*

but actually getting in contact with them if they’re not in hospital, because they do other sites as well ... can be difficult at times.

3.4. Unhelpful training

Ten participants had attended workplace PaS training sessions which they described as unhelpful. These clinicians were critical of the training because it was not ongoing or related to their practice concerns. One clinician articulated a common view. He said: *“I believe there are policies about it [the PaS of patient information] but there should be ongoing training for clinicians so they fully understand their responsibilities ... staff in this department keep on saying they’re not clear about what it means.”* The same participant continued on to criticise hospital authorities who had provided the training, summarising feedback from many of the clinicians. He said: *“It’s [the training] poorly done, it’s not systematic and it’s poor. I mean it should, in a sense, if the privacy principles are that important, there should be ongoing debate within the hospital and a forum where people can discuss this regularly. ... But for example, if you’ve got something urgent, is there a case where you could email something about a client? It’s that kind of thing the staff ask for constantly and I don’t have answers because I haven’t had the training and it’s not my specialist area, so it really needs specialist input.”* He continued: *“What does it [current PaS workplace training] mean for my practice? What does it mean today when I’m ringing a client?”* Another participant added: *“... for example, can you email client information to somebody else? Now sometimes people do, but I believe the policy in this place [the hospital] is that you shouldn’t, it should only be by fax when it’s client stuff.”* One trained participant felt she had no access to practice information at all. She said: *“I often feel alone. I have no information about how to protect patient security so I have to use my own judgement - I feel helpless about what to do about patient security.”*

The participants were also concerned that PaS training took no account of practice discipline. One clinician spoke of instances where he and others had attempted to achieve PaS training that was contextual or stratified according to practice discipline. He said: *I’m asking you [hospital authorities] to put training on... here’s the results of the staff survey, [I took], because I had whinged to them, but nothing, kind of, happened. It has been incredibly difficult to get them [the hospital] to move on it.* Another clinician acknowledged that contextual training should be implemented by the hospital. She said: *“It’s [contextual PaS training] not done on the, in the clinical areas, but it needs to be. ...they [hospital authorities] now have to get it down to the grassroots.”* Still another participant worried about the source of workplace PaS training. He said: *“I wonder whether the reason we’re not getting [contextual PaS] training is because the people who are information experts may not know [about clinical implementations], so they’re not giving the training.”* Finally, one participant, concerned that patients in rural areas would not seek medical treatment when required due to concerns they might be recognised by hospital personnel, pointed to the different PaS training needs of rural hospitals vis-à-vis metropolitan hospitals. She explained: *“You know patients coming into A&E [Admissions and Emergency], ...might be coming in for something a bit silly or something that they might have done to themselves and they don’t really, you know, on the spur of the moment, want it to go any further than here.”*

Other participants criticised the training because it was not competency-based and paid no regard as to whether the clinicians had absorbed the training into their practice or not. One of them pointed out that the training was *“a bit cursory”* while another commented: *“It’s not an ongoing thing once you’ve done the training once. It’s not mandatory and you can’t repeat that training.”* Finally, another group of participants stated that they found the training ses-

sions *inconvenient* because they were *boring* or *repetitive* and removed the clinicians from patient care settings.

4. Discussion

Study findings mean that the PaS needs of the clinicians, who expressed a lack of confidence in workplace HIS training sessions, may be indicative of much more widespread concerns about PaS implementations. The feedback indicates four key areas for further action to support national e-health efforts. Firstly, the training requirements for individual clinicians who provide patient care with HIS must be specified by authorities since health practices are bound by Australian privacy laws and other legislation. Secondly, scheduling issues need resolution so that all clinicians can be trained to secure private patient information in clinical settings. Thirdly, workplace training ought to be tailored to the needs of particular groups of clinicians. Finally, workplace training sessions would be enhanced if they were contextual. Each key area for further action is explored in turn.

Firstly, while training requirements for clinicians who provide patient care with HIS are not specified by health authorities, health practices are bound by Australian privacy laws and other legislation [6]. For privacy guidance in line with their legal obligations, the practices are forced to depend upon security controls listed in *HB174:2003*, where the content of workplace training sessions is specified. Most clinicians interviewed for this study could not distinguish between workplace training to define private or confidential information classifications and training that focuses on how to protect private information. It would be surprising if none of the clinicians could recall this part of their training. Based on their confusion over the matter, it's probable that the training did not demonstrate differences between the concepts or, if it occurred at all, conflated the concepts in the same way as this study has reported findings. The

training sessions provided by the public hospitals may comply with the *HB174:2003* requirement to protect patient information, but not the requirement to define private information. The practical effect on health services of clinicians who cannot define clinical information protected under the law and the impact of this on e-health frameworks could be problematic, currently and in the future.

Several clinicians commented too, that in their experience, workplace training was often provided in a written form, via the circulation of privacy acts and updates to the legislation for example, or nested in contracts of employment, with no reference to a person where one might ask questions. In one instance, the training consisted of legislative updates that were attached to a clinician's payslip. As far as the clinicians were aware, the hospitals did not check whether the written PaS training material was actually read, let alone absorbed into clinical practice. Therefore, for PaS implementations to be effective, health authorities must specify clinician training requirements.

Participants reported that workplace HIS PaS training sessions were often of poor quality. The clinicians were concerned that the workplace training was unhelpful. It was not ongoing, related to practice concerns or competency-based. For instance, the training sessions were often embedded into training for the introduction of a new e-HIS, generally several weeks prior to installation. By the time the new system was implemented, clinicians reported that they had forgotten relevant PaS training. Furthermore, should a clinician require assistance to remember how to ensure the security of private information, trainers were generally unavailable or difficult to contact. Regardless of whether eHIS training was helpful, it was the only PaS support available to some clinicians. Currently, while the hospitals may believe they have fulfilled their legal obligations vis-à-vis information privacy this way, one cannot assume that

clinicians, patients or the Australian legal system would agree [6, 10, 12, 20].

Secondly, the scheduling of workplace information PaS training sessions for clinicians has also proved problematic. Some private clinicians function in the patient care settings of public hospitals. Apparently, scheduling training courses for these clinicians is simply too difficult for the hospitals. Many clinical personnel are casual or part-time employees. The majority of clinical personnel at the hospital, including full time clinicians, were required to do shiftwork [13]. Clinicians are not always available for training within hospital constraints or business hours. The clinicians, especially clinician-managers, commented about how difficult it was to schedule training that all of them could attend. Hospital PaS training sessions could not accommodate clinicians that did not fit into customary workplace training schedules.

The scheduling problems were exacerbated by the time training sessions took away from clinical care workloads. Clinicians were not keen to attend workplace training that took them away from direct patient care. Consequently, some clinicians chose to miss out entirely on workplace PaS training sessions. Moreover, workplace training sessions were never repeated for the clinicians neither were they mandatory. The scheduling problems, based on the literature, probably meant too that some clinicians did not know how to secure private information during their use of HIS in clinical settings. Clinicians who cannot secure private information could affect the security of current HIS while presenting an obstacle to national e-health frameworks in the future. Scheduling issues should be addressed so that all clinicians are trained to secure private patient information in clinical settings.

Thirdly, workplace PaS training must be tailored to the needs of particular groups of clinicians. Participant feedback indicates that workplace training did not deal with practice concerns, which affected patient care greatly every day. Some

participants questioned the competence of workplace trainers as well as the PaS training sessions. Clinicians did not know whether they were permitted to communicate private patient information to colleagues using eHIS, let alone how to securely communicate the information. Study participants did not know what information could lawfully be intercommunicated using a HIS. Clinical confusion about the definition of private or confidential information classifications, noted earlier, aggravated practice concerns. Consequently, many clinicians communicated patient information in an ad hoc way. This communication style is likely to cause PaS difficulties in the future or where patient care settings are presently computerised because, at a national level, ICT-based systems are based on a unified ways for clinicians to enter patient information [26].

Clinicians felt that ongoing PaS training sessions might attend to their practice concerns. The feedback was linked to other responses expressing anxiety that workplace training sessions were not competency-based. Competency-based training underpins many clinical qualifications [13]. Some clinicians felt that if workplace HIS security and privacy training were competency-based then they would not be of *such a poor quality*. To get around the lack of competency-based training some of the clinicians suggested that hospital workgroups could meet regularly to talk about how PaS affected their practice concerns. These competency-based, *grassroots* groups would look closely at the way contextual factors affected the PaS of health information.

Finally, most clinicians agreed that contextual training would be a step toward achieving competency-based PaS training. For example, rural health privacy concerns, where people may know each other, are different from those of metropolitan patient care settings. Clinical jobs in rural areas are also different from those in metropolitan areas and those on the fringe. Contextual PaS training could

effectively target the clinical practice concerns of a wide array of clinicians to ensure a successful foundation for national e-health endeavours.

5. Conclusion

Irrelevant PaS training sessions hamper clinical confidence in contemporary HIS practice and the introduction of unified e-health records at national levels. Overall feedback indicates that the clinicians were not confident in workplace training about the PaS of patient care. The training was too general, hard for hospitals to schedule and clinicians to attend, unhelpful or of poor quality and was not contextual. Participant lack of confidence in the workplace PaS training affected clinical work on a regular basis, where decisions affecting patient privacy were routine events. Consequently, in the words of one participant, clinicians believed the training was *irrelevant*. Irrelevant PaS HIS training sessions mean that government efforts to introduce e-health frameworks so as to improve the quality and efficiency of patient care could be difficult to achieve. There is a pressing need for further research into the management of HIS PaS workplace training. Study findings will be revisited next year. Based on participant feedback and the literature, the challenge of ensuring an effective PaS implementation for e-health may have thus far eluded health authorities.

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