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Why Teach Computer Security to Medical Students?

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Abstract

The introduction of Electronic Medical Records (EMR) within the healthcare practice can be beneficial in order to integrate and centralize heterogeneous patient information. However, there are still some problems that hinder the successful use of EMR. The concern for patient privacy is one of them. The aim of this paper is to present the results of a study that assesses attitudes of 1st year medical students towards computer security and the EMR. An anonym questionnaire was given to the students at the beginning and at the end of the academic year of 2003/2004 for them to comment on several security related scenarios. 238 questionnaires were answered at the beginning of the year whilst 222 were answered at the end of the year. The students feel, at the end of the year, that they understand better what computer security is and how to protect patient privacy information. This shows that teaching computer security to medical students, the future users of EMR, can greatly influence the success of EMR integration and therefore improve and fasten healthcare treatment.

Keywords:

computer security; education, medical, undergraduate

Introduction

The introduction of Electronic Medical Records (EMR) within the healthcare practice allows for the integration of heterogeneous information that are usually scattered over different locations [1] [2]. However, there are some barriers that impede its successful integration in most healthcare practices [3] [4].

One specific barrier relates with the privacy and security of patient information [5]. The use of new information systems within healthcare stresses the need for young doctors to comprehend them from their conception so that they can be used in a beneficial way and support their future daily work. As such, all the feedback provided during their training into the medical profession is essential for the enhancement of those systems [6], moreover in terms of computer security.

The Biostatistics and Medical Informatics Department of Porto Faculty of Medicine teaches Ethics and Medical Informatics to 1st year medical students [7]. The later subject includes theoretical and practical lectures about Electronic Medical Records (EMR) and computer security.

This study aims to assess the opinions, attitudes and awareness of 1st year medical students towards computer security issues relating to EMR, and how these can affect the successful integration of EMR within the healthcare practice.

Methods

An anonym questionnaire was given to the students both at the beginning and again at the end of the academic year of 2003/2004. It was applied two times so that we could compare their attitudes before and after they had attended the Ethics and Medical Informatics' subjects.

The questionnaires introduced 3 scenarios for the students to comment. The first scenario described a breach of patient privacy to an EMR by one of their colleagues. There were two questions relating with this scenario:

- Q1.A – Is the described scenario a security breach?
- Q1.B – What would you do if you found out about this breach?
- The second scenario included additional information to the first scenario. It explained that the colleague in question had shared his password with a friend and that friend was the one to access patient private information, without him knowing it. The question related with this scenario was:
- Q2 – Would you change your attitude if you found out this new piece of information?
- The third scenario introduced the issue of more sensitive information (e.g. HIV, Cancer results or even VIP related) and how this information must be protected. The question presented within the questionnaire was the following:
- Q3 – Do you think this kind of information requires stronger security measures than other types of information?

The answers to these questions were inserted into SPSS® and analysed separately.

Results

A total of 460 questionnaires were filled by the students. 52% (238) were answered before the lectures started whilst 48% (222) after the lectures finished. Table 1 shows the results obtained from the applied questionnaires.

Table 1 – Results obtained from the questionnaires

		Before the lectures % (n)	**After the lectures % (n)**
Answered questionnaires		*(238)*	*(222)*
Q1.A	*Valid answers*	*98 (232)*	*98 (217)*
	Yes	100 (232)	100 (217)
Q1.B	*Valid answers*	*61 (144)*	*60 (132)*
	Reason with	54 (77)	44 (58)
	Inform	40 (58)	50 (66)
	Others	6 (9)	6 (8)
Q2	*Valid answers*	*62 (148)*	*62 (138)*
	No	74 (109)	83 (115)
	Yes	26 (39)	17 (23)
Q3	*Valid answers*	*43 (103)*	*91 (204)*
	No	44 (91)	38 (77)
	Yes	55 (112)	62 (127)

For Q3, the main reason given by the students that felt no extra security measures were needed to access more sensitive information is that all security measures must be effective for all cases, independently of the patient or healthcare performed. The majority of the students that thought extra security measures were necessary agreed that this would provide for the protection of certain social groups from discrimination.

Conclusion

According to this study's results, after Medical Informatics and Ethics' lectures, students feel more conscientious to report privacy breaches to responsible parties (Q1.B). They understand better what computer security is and how to behave in order to protect confidentiality of electronic information. They consider indirect disclosure of sensitive information, such as with another person's password, a serious fault (Q2). Further, at the end of the year, students become more aware for the need of different protection levels of security depending on how sensitive information can be (Q3).

We believe that the introduction of Medical Informatics and Ethics early in the degree of the Medical course has an influence in the awareness and attitudes of first year medical students towards computer security and EMR. This can greatly influence the success of EMR integration whilst improving and fastening healthcare treatment.

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