Patient Education and Counseling 93 (2013) 515–521

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

The impact of residents' training in Electronic Medical Record (EMR) use on their competence: Report of a pragmatic trial

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ARTICLE INFO

Article history:
Received 15 November 2012
Received in revised form 22 July 2013
Accepted 12 August 2013

Keywords:
Electronic Medical Record (EMR)
Doctor–patient–computer communication (DPCC)
Doctor–patient communication
Simulation based training (SBT)
Medical education

ABSTRACT

Objectives: Even though Electronic Medical Records (EMRs) are increasingly used in healthcare organizations there is surprisingly little theoretical work or educational programs in this field. This study is aimed at comparing two training programs for doctor–patient–computer communication (DPCC).
Methods: 36 Family Medicine Residents (FMRs) participated in this study. All FMRs went through twelve identical simulated encounters, six pre and six post training. The experiment group received simulation based training (SBT) while the control group received traditional lecture based training.
Results: Performance, attitude and sense of competence of all FMRs improved, but no difference was found between the experiment and control groups. FMRs from the experiment group evaluated the contribution of the training phase higher than control group, and showed higher satisfaction.
Conclusion: We assume that the mere exposure to simulation served as a learning experience and enabled deliberate practice that was more powerful than training. Because DPCC is a new field, all participants in such studies, including instructors and raters, should receive basic training of DPCC skills.
Practice implication: Simulation enhances DPCC skills. Future studies of this kind should control the exposure to simulation prior to the training phase. Training and assessment of clinical communication should include EMR related skills.

1. Introduction

Electronic Medical Records (EMRs) are increasingly being used in healthcare organizations in general and in ambulatory settings in particular. Their use has been promoted around the world by governments and organizations. Perhaps most notable is the investment of the United States government in promoting EMRs for all Americans by 2011, as part of the American Recovery and Reinvestment Act [1]. A number of countries, especially in Western Europe, as well as Israel are in advanced stages of developing national EMR systems [2–4].

The impact of this phenomena is still under investigation, and while reports of the positive impact of EMRs are multiplying, negative effects and reservations emerge as well [5]. EMRs have transformed the clinical encounter; as a literature review [6] shows, the computer is an active player that mobilizes both patient and physician in active as well as passive ways. Thus, the dyadic doctor–patient relationship is presently necessarily a triadic doctor–patient–computer one [7]. Hopes that the computer will exert a major positive change for patient care safety have been tampered by the realization that new errors occur [8]. The analysis of these new safety risks demonstrates a small gap between improving efficiency and jeopardizing safety; sometimes the same characteristics and features that improve efficiency and safety increase EMR associated errors [8]. Thus, a fine balance exists in the two domains of communication and safety in the computerized setting – between empowering the encounter and improving safety versus disabling both.

The use of EMRs has a positive impact on medical care through better adherence to guidelines, clinical monitoring and medical error prevention [5]. Our review of the literature [6] as well as our own study [9] suggests that EMR use positively affects information related tasks such as gathering medical history, review of patient's medications and biomedical information exchange. Nevertheless,

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http://dx.doi.org/10.1016/j.pec.2013.08.007

EMR use had also some negative effect on the doctor–patient relationship, developing rapport with patients and psychological and emotional talk which are important elements of patient centered care [6]. Noordman et al. [10] showed that, 7 years apart, physicians were more efficient using the computer, but using the computer was still negatively correlated with communication, especially by reducing looking at the patient and the amount of information given by the patient. Recent criticism reproaches the EMR by, "raising a cautionary note about some unrecognized dimensions of the use and experience of the EMRs, such as unconsciously becoming an instrument of assembly line-like physician "productivity" and "production reports" that depersonalize patient and physician alike". The author concludes with a call to imaginatively use the EMR as an instrument in support of doctor–patient communication [11].

Several factors which affect doctor–patient communication in computerized primary care settings have been identified. First, different physicians have diverse communication and encounter management styles. Whether the computer facilitated communication or had negative impact often depended on these styles [12,13]. Along the same lines, it has been reported that the EMR facilitated both negative and positive baseline communication skills [14]. More recently, it has been suggested that the impact of the EMR on communication depends on both the physician's and patient's style [15,16]. Second, enabling factors which facilitate communication include the combination of computer mastery (e.g., navigation skills, use of keyboard shortcuts, and fast screen scanning) and basic communication skills (e.g. maintaining eye contact, listening, and use of humor to break tension) [6,9]. Typing skills, in particular, emerged as a key enabler of doctor–patient communication in computerized primary care settings. Blind (touch) typing greatly reduced the need to divide attention between the patient, monitor, and keyboard thereby allowing physicians to allocate more time and attention resources to the patient [6,9]. Finally, a number of strategies and best practices that facilitate doctor–patient communication in computerized primary care settings have been identified. The main strategy was dividing the encounter into patient and EMR-focused stages. Best practices included reading out loud while typing, use of predefined text templates, and sharing the monitor with the patient [6].

One way of improving safety, communication and encounter efficiency while using EMRs, is through instruction [8]. Physicians can be taught strategies to facilitate the medical encounter, i.e. how to use best practices to maximize the EMR advantages while keeping good doctor–patient communication and minimizing EMR based errors. The simulation setting is presently considered ideal for instruction and evaluation in medicine [17]. There is a paucity of theoretical work in the doctor–patient–computer communication (DPCC) field, as well as a surprisingly small amount of educational programs for implementing computer systems in the clinical setting [8].

This study focused on doctor–patient communication in the presence of an EMR system. The study tested two different instruction interventions for empowering doctor–patient–computer communication (DPCC), the first, a simulation-based workshop which should theoretically be superior in its educational impact and the second, a traditional lecture-based conference, and compared them. We also used this research to test our evaluation package of EMR use by Family Physicians [18].

1.1. Study hypothesis

Participants' doctor–patient communication skills will improve after simulation-based training.

Participants' EMR handling skills will improve after simulation-based training.

Participants' performance will be enhanced by simulation-based training in comparison with traditional lecture based instruction.

2. Method

2.1. Population

Participants in this research were 36 Family Medicine HMO residents (15 males, 21 females) from Maccabi Healthcare Services, Israel's second largest HMO. A request was sent to all of the residents (80) in the HMO, and 36 volunteered for the research project. We aimed at 24 subjects in each group (or a total of 48), based on power calculations (see below), but were able to recruit only 18 for each group. The sample was divided into predefined clusters according to their seniority, and from these clusters randomly assigned into the two intervention (training) groups: a simulation-based training (SBT) group (9 females and 9 males) and a lecture-based group (12 females and 6 males). All participants were introduced to the project in the beginning of the first simulation day with an identical general explanation about the research and instructions related to its implementation.

The raters (who observed and scored the pre and post test) and instructors (who administered the intervention) in this research were senior Family Physicians, experienced educators from Maccabi Healthcare Services. All Physician-raters participated in a one day train the rater (TTR) workshop that included two parts: part 1 – short theoretical background of assessment and of doctor–patient–computer communication, part 2 – video-based assessment and calibration exercise. Physicians – instructors participated in a one day feedback workshop that included theoretical background and simulation based training on how to give feedback. Each trainer participated in 6 simulations followed by one on one feedback from the Standardized Patient (SP) and from the workshop instructors.

The intervention operationalized the ten tips for enhancing the computerized setting clinical encounter published in our literature review ([6], Appendix 1). The same tips were talked about in the lectures of the control intervention. Thus, the difference in their promotion was that in the intervention group they were learnt through experiential learning and in the control just by listening to a lecture.

MSR, the Israel Center for Medical Simulation at the Sheba Medical Center, created a simulated primary care clinic setting complete with a high-fidelity EMR system (Clicks by Roshtov and the Maccabi portal) installed for the present research purposes.

The simulation based intervention was based on a former study [18] in which scenarios were pilot tested on a small number of Family Physicians, revised and employed in a larger pilot that included 12 FMRs, in a day long workshop (DLW). Also, 6 senior trained raters/observers closely watched the encounters, completed evaluation tools and participated in the debriefing .All simulated encounters were video-taped. Three weeks after the DLW, a post-training test was conducted with 6 different analogical scenarios, the same 12 learners and 6 senior trained observers. The pilot results provided information mainly on the performance of the scenarios and evaluation tools, with limited aspects of educational impact, acceptability and feasibility, and without power to supply reliability, validity or statistical significance. The simulation, evaluation and debriefing tools developed performed adequately, and were deemed acceptable and feasible. A trend towards positive educational impact was noted [18].

As described previously, fine tuning of both intervention and pre/post tests were undertaken subsequently and employed in the present study. Based on the 12 learners' performance in the pilot study we found an average improvement of 1.5 points (on a 4–16