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Impact of simulation training on self-efficacy of outpatient health care providers to use electronic health records

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ABSTRACT

Objectives: To examine whether simulation training enhanced self-efficacy of physicians and nurses who work in the outpatient setting to use electronic medical records, and whether the training changed their perceptions about the importance of electronic medical records (EMRs) in helping patients and improving patients' safety.

Methods: Two-hundred and ninety-three physicians and 94 nurses participated in the study. Participants first attended two computer classroom training sessions on how to use EMRs. Subsequently, the participants attended simulation training and practiced application of EMRs while encountering standardized patients. They answered questionnaires on a seven-point Likert-type scale prior to and immediately after simulation training. The questionnaires assessed their perceptions about the importance of EMRs in helping patients and improving patients' safety and their confidence and preparedness level to use EMRs.

Results: The overall self-efficacy of physicians and nurses to use EMRs increased after simulation training as compared to before simulation training. The physicians' and nurses' ratings about importance of EMRs to help patients' and improve patients' safety after simulation training were relatively unchanged compared to the ratings before simulation training. Additionally, participants described simulation training as exceptional, because it was an interactive learning opportunity to use EMRs within a simulated clinical setting with a simulated patient.

Conclusions: Simulation training in the current study enhanced physicians' and nurses' level of self-confidence and preparedness to use EMRs. To train health care providers how to use EMRs, simulation training should be considered as an interactive and effective method of teaching prior to implementation of EMRs in medical institutions.

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1. Introduction

Electronic medical records (EMRs) can reduce medical errors and potentially improve patient safety [1]. An in-depth review of the biomedical literature demonstrated a positive impact of EMRs in outpatient settings for approximately half the outcomes measured [2]. One-year after EMR implementation, inpatient health care providers reported higher scores for communication, job satisfaction, patient safety, quality of data and organizational support. [3]. In the United States, the federal government is investing billions of dollars to promote widespread implementation of EMRs by health care systems and providers [4]. However, inappropriate implementation or adoption of EMRs can contribute to medical errors that cause serious injuries or even deaths [1].

Numerous reports have identified problems associated with EMRs implementation. Electronic medical records can impede patient-centeredness and communication with patients [5]. Further, a systematic review of the implementation experience in seven countries adopting EMRs demonstrated staff anxiety as a barrier to effective implementation and recommended adequate training [6].

Simulation training provides learners an opportunity to deliberately practice, with focused learning objectives and immediate feedback about their performance, before clinically interacting with real patients [7]. Prior to implementation of EMRs, simulation training in which health care providers practice their workflow by interacting with standardized patients, lay people trained to report a patient history and convey symptoms, could improve skills of health care providers to use EMRs and increase patient safety [8]. According to Haugen, adoption rates of EMRs were 70% higher for providers who used simulation compared to traditional training approaches [9]. Further, a qualitative study was conducted on usability evaluation and workflow integration of clinical decision support (CDS) with eight primary care providers by using video clips of clinical scenarios enacted by trained standardized patients [10]. However, only a few studies describe simulation training for health care providers before implementation of EMRs, and our literature search results yielded none that did so for health providers in the outpatient setting [11–13]. The primary purpose of our study was to examine whether simulation training enhanced the self-efficacy of physicians and nurses to use electronic medical records. A secondary purpose was to examine whether simulation training would have an impact on physicians' and nurses' perceptions about the importance of EMRs in helping their patients and improving patients' safety.

2. Methods

2.1. Ethics

The University of Arkansas for Medical Sciences (UAMS) Institutional Review Board (IRB), in Human Subject Research

Determination for IRB # 202051, determined this educational study was exempt from their oversight.

2.2. Setting

The study was conducted at UAMS in Little Rock, Arkansas. As the sole academic health science center in Arkansas, UAMS provides comprehensive inpatient and outpatient care. In June 2013, systems training began for use of the new EMR (Epic Systems Corporation™, Verona, Wisconsin). Subsequently, in August 2013, 47 outpatient clinics at UAMS implemented the new EMR.

Physicians and nurses who worked in these clinics mandatorily attended simulation training in the UAMS Centers for Simulation Education. We conducted the simulations in a simulated outpatient clinic, which featured 14 fully equipped clinic rooms. Each room contained hardware and an Epic electronic training environment dedicated to simulation to facilitate systems training. The rooms featured video cameras and one-way glass for observation.

2.3. Participants

All physicians, nurses and other health care providers who worked in outpatient clinics where a new EMR was implemented were required to participate in the systems training. The university paid them for their time.

2.4. Procedure

Participants first attended two four-hour computer classroom training sessions. The content of these sessions was from the Epic Training Wheels training platform. It included: (a) navigation of the system, (b) reviewing, verifying, and updating information, (c) entering physicians' orders, (d) reviewing, responding to, and managing diagnostic results, and (e) documenting patient encounters. In these classroom sessions, Certified Trainers served as instructors. The Certified Trainers previously received Epic training and passed standardized examinations specific to EMR use by physicians and nurses who work in the outpatient setting.

Subsequently, the participants participated in a two-hour simulation in the Centers for Simulation Education. Each participant used the EMR while encountering standardized patients, lay people trained to report a patient history and convey symptoms. We recruited two-hundred and forty-nine standardized patients via the following: (a) from our existing pool of standardized patients, (b) word-of-mouth from our existing pool, and (c) social media. Of these 84 actively served as standardized patients in the simulations. They received a modest payment for their time. The standardized patients received training to present a patient history and symptoms for each simulated case as well as training in giving feedback to the health care providers about etiquette for communication while using an EMR during a patient encounter. The LEVEL guidelines developed at Kaiser Permanente (www.kaiserpermanente.org) served as a framework for their feedback. The guidelines outlined in the LEVEL acronym are as follows: (a) Let the patient look on the computer screen to see his or her medical record; (b) Eye contact; (c) Value the

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