Identifying care providers’ and clinic staff members’ attitudes toward electronic medical records:

An application of the technology acceptance model

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ATTITUDES TOWARDS ELECTRONIC MEDICAL RECORDS

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Background and Objectives

Electronic medical records (EMRs) have the potential to enhance patient care by facilitating communication between patients and their doctors, storing medication information and test results, and allowing for easier appointment scheduling. However, there are several barriers (i.e., increased workload and lack of personnel) to the implementation and use of EMRs that can prevent healthcare organizations from taking full advantage of these affordances. Several researchers (e.g., Chau & Hu, 2001; Davis, 1989) have utilized the technology acceptance model (TAM) in a variety of contexts to identify the facilitators and barriers to the use of new technologies in organizations. More specifically, TAM has been applied to healthcare settings in an effort to explain the process by which care providers and patients engage with or reject health technologies (Hu, Chau, Liu Sheng, & Kar Yan Tam, 1999; Ketikidis, Dimitrovski, Lazuras, & Bath, 2012; Kim & Chang, 2007).

TAM originally posited that individuals first assess the perceived usefulness and ease of use of a new technology, which then affects individuals’ attitudes and intentions to interact with that technology (Holden & Karsh, 2010). However, a later revision of TAM by Venkatesh and Davis (2000) incorporated job relevance and subjective norms in order to account for the impact of others’ opinions on one’s likelihood to adopt a new technology. Although TAM has been extensively used to explain the role of health information technology in healthcare (Holden & Karsh, 2010; Mohd & Syed Mohammed, 2005; Seeman & Gibson, 2009), little work has been done to provide a qualitative, in-depth evaluation of the attitudes held by doctors, nurses, and clinic staff toward EMRs. We argue that this comprehensive feedback can be extremely useful for a holistic understanding of how individual healthcare organizations (i.e., clinics and hospitals) can successfully encourage EMR use by patients while also avoiding increases in workload for care providers and staff.

Thus, the purpose of this study is to apply the technology acceptance model to examine how primary care physicians, nurses, and medical and clinic staff (medical assistants, referral coordinators, and patient care coordinators) describe (a) their attitudes toward their clinic’s EMR system and (b) their patients’ engagement with the clinic’s EMR system. In doing so, we seek to obtain a more thorough understanding of the challenges and benefits associated with EMRs that individual healthcare clinics face when implementing this type of health information technology.

Methods

We conducted semi-structured interviews (N=39) with primary care physicians, nurses, medical assistants, and clinic staff who were all employed at a clinic in the south. This clinic had recently upgraded a patient portal system that gave patients the opportunity to activate and maintain their own EMRs. In order to gain access to our participants, we worked closely with the clinic’s manager and marketing director. Specifically, the clinic manager helped coordinate interviews with willing and interested doctors, nurses, and staff. One of the study’s researchers spent a total of 19 hours at the clinic interviewing and meeting with available clinic employees. All interviews were in-person and were conducted at the clinic in a private room.

Of the 39 clinic employees who were interviewed, 11 were primary care physicians (specializing in family, internal, or extensivist medicine), nine were nurses (registered nurses, licensed practical nurses, and triage nurses), five were medical assistants, five were patient care
coordinators, three were referral coordinators, and the remaining six worked in administrative or management positions. These positions included: nursing supervisor, registered nurse (RN) clinical supervisor, patient services team leader, business office supervisor, distributor coordinator, and clinic manager. The schedule of questions for the interview focused on the significant issues related to the acceptance of the new EMR system and was created based on the suggestions of the clinic manager and marketing director. The topics covered included: the impact of EMRs on workload, reasons for engaging with the EMR, patients’ perceptions and adoption of the EMR, EMRs as a communication tool, opportunities for improvement with the EMR, benefits of using the EMR, and training. Sample questions included: “How does [name of EMR withheld] impact your workload?” “How do you talk about [name withheld] with your patients?” “What would you like to change about the current version of [name withheld]?” “What do you think is motivating some doctors and nurses to encourage patient use of [name withheld]?” “What do you think is preventing some doctors and nurses from encouraging use of [name withheld]?” All interviews were audio-recorded. The majority of the interviews have been transcribed and we are in the process of finishing the remaining transcriptions.

Results

Our initial results indicate five recurring themes regarding the acceptance of and attitudes toward the clinic’s EMR system: appropriate use and educating patients about meaningful engagement, active versus inactive users, age as a potential barrier to acceptance, increases in workload, and the need for a message filtering process. One of the most salient concerns that nurses and staff expressed about patient engagement with the EMR had to do with appropriate use of the messaging and appointment-scheduling features. Multiple interviewees described frustration with patients who abuse the messaging component by sending very long messages or thinking that they can have back-and-forth exchanges with their doctors. Moreover, interviewees mentioned that at times patients tried to schedule meetings through the EMR in emergency situations or scheduled meetings of shorter durations for longer procedures (e.g., physical exam).

This discussion led some interviewees to describe the importance of educating patients about meaningful engagement with the EMR. Some of the nurses described walking their patients through the activation process of the EMR in the exam room if the nurses had time, while others indicated a need for increased effort in terms of educating the patients on how to use the patient portal. Yet other nurses suggested that asking patients about whether or not they like to use technology and email can be helpful for deciding if a patient will actually benefit from the EMR. Another important component that surfaced during the interviews was “active” versus “inactive” users. For instance, some of the interviewees described problems in the past with (inactive) patients who initially activated their EMRs, but never returned to it, which led these patients to be unaware of their lab results or messages from doctors that had been posted to their EMRs.

With regard to the barriers of acceptance, there were mixed reactions to age as an indicator of EMR use. Age seemed to be more of a factor for doctors, but less relevant when identifying barriers to use among patients. Additionally, multiple interviewees reported on the effects that the EMR had on their workload. Some reported that their workload had increased because of the EMR, but that this was not as big of a problem as they had originally anticipated because the messaging component of the EMR allowed them to respond to messages more efficiently. Others described a decreased workload because rather than spend time on the phone talking with a patient or calling a pharmacy for refills, they could send messages directly to the
patient and manage all of the patient’s needs in the system, which allowed some of the doctors and nurses to work more efficiently. The process of responding to patients’ messages had been improved by the clinic’s recent effort to implement a *message filtering process*, which the doctors and nurses described as very helpful because it streamlined messages from the patients in such a way that only those having to do with the patient’s medical condition reached the doctor. Patient messages have to do with referrals, medication refills, appointments, and miscellaneous topics were screened upfront by the nurses and staff. Table 1 contains examples representative of each of the themes.

**Conclusions**

Primary care physicians, nurses, and medical and clinic staff expressed a range of attitudes toward a newly implemented, clinic-wide EMR system. Although the majority of interviewees reported positive attitudes toward the EMR, some of the responses indicated a greater need for patient education in order for this technology to be more widely accepted throughout the clinic. Unlike past studies that measure adoption rates of EMRs across multiple healthcare facilities (Angst, Agarwal, Sambamurthy, & Kelley, 2010; Berner, Detmer, & Simborg, 2005), the current study provides an in-depth look at one clinic’s implementation of EMRs and captures a variety of perspectives provided by care providers and staff. The majority of interviewees expressed positive attitudes toward the clinic’s EMR system and the process by which the clinic introduced the EMR to its employees and patients. Even those who described an increase in workload because of EMRs explained that the extra work was not necessarily a negative part of their jobs because the system is set up so that each of the clinic’s employees knows when he/she needs to step in and respond to the message, which allows for a more efficient and more streamlined message-routing process. Having positions like patient care coordinators, referral coordinators, and triage nurses has allowed the clinic to ensure that the patients’ messages are being channeled to the appropriate outlets and helps prevent the doctors’ inboxes from becoming excessively full.
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<th>Theme</th>
<th>Example</th>
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<td>Educating Patients about Meaningful Engagement and Appropriate Use</td>
<td>“It’s like giving the patient a master key to the building. It’s great for the ones that read it and pay attention and do it the right way, it’s great. Then there are some that really just don't and they’ve figured out how to wiggle the system. It's not there yet. The visit types are always incorrect. Or sometimes they all come for four other reasons and try to get one appointment” (Interview 21).</td>
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<td>Active Versus Inactive Users</td>
<td>“A lot of them have lost their passwords or don't remember it and then they have to reactivate it, or they come back and say, ‘I never got my results.’ Well, you're on [name withheld] we sent it there. They're like, ‘I don't even look at [name withheld]’” (Interview 19).</td>
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<td>Age as an Indicator of Use</td>
<td>“I think the younger person probably just wants a quick answer. They don't want to write five paragraphs. The older person, that's where I've seen where I've gotten it more is my older, retired person who has more time and has all kinds of questions” (Interview 14).</td>
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<td>Effect on Workload</td>
<td>“It has really decreased my workload, mostly because the doctor sends the lab results straight to the patient through email when I used to be the one calling them back and now I don't even do that. It frees me up to do other things, refills and direct patient care, stuff like that. The electronic medical records part really has decreased my workload” (Interview 1).</td>
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<td>“It's made my workload probably increase, but in a good way. It makes it go much smoother, because I can do more. I'm not just stuck on the phone for 9 hours a day. That's nice. I like it a lot” (Interview 3).</td>
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<td>Message Filtering</td>
<td>“I think [the distributor coordinator] sees all of the messages and routes them to the specific places they need to go, or takes them away. All the superfluous messages that patients send to doctors all the time that the doctor doesn't need to see, he takes them, deals with it” (Interview 5).</td>
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<td>“I [distributor coordinator] am the first person to see the initial message from the patient. I decide if I can respond to it immediately or if I need to send it to the clinical staff or the doctor or to billing, referrals” (Interview 10).</td>
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References


