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Exploring iPad Usage by Healthcare Professionals in a Pediatric Hospital

By J. Teves , B. Chaparro , B. Kennedy , R. Chan , N. Copic , R. Riss & J. Simmons

Summary. Healthcare providers have been given iPads for use in the workplace. One expected use was to provide portable access to patient electronic medical records (EMR). Healthcare providers at a pediatric hospital completed an online survey, which described their typical usage, likes, and dislikes of the iPad in the pediatric hospital setting. Results indicate that healthcare personnel of various disciplines recognize that the portable tablet can potentially make a significant impact on their workflow in the hospital setting. However, the use of a desktop-designed interface displayed on a touchscreen tablet is not consistently optimal and at times a hindrance. Additionally, a high-speed stable wireless network is required. Although the tablet is a great tool, it may require a native touch screen software design to maximize its capabilities and reliable networking to maximize speed and performance.

Note: This is a summary of the poster presentation titled "Survey on iPad Usage in a Pediatric Inpatient Hospital" in the Symposium on Human Factors and Ergonomics in Health Care: Bridging the Gap, Baltimore, MD 2012.

INTRODUCTION

When the first generation of the Apple iPad was released in 2010, it not only paved the way for the proliferation of tablet computers in the market (Nguyen & Chaparro, 2011), but it also opened new avenues for mobile tablet devices. Today, the domain of healthcare is one of the areas being reshaped by this technology. The Apple iPad is now used in home doctor visits and patient consultations. In Australia, healthcare workers use it to access and create digital information of patients particularly when visiting health clinics in remote locations (Ribot, 2010). In Japan, doctors use the Apple iPads to assist them during patient consultations (The Yomiuri Shimbun, 2010).

Doctors and other healthcare providers can also benefit from a number of medical applications (apps) available on the Apple iPad. For instance, the app iBronch for iPad was designed to get doctors familiarized with the anatomy of the trachea and the bronchi. It uses real bronchoscopy images and even allows the user to simulate manipulation of a virtual bronchoscope. The application was developed by Dr. Edward Bender, a computer programmer and cardiothoracic surgeon (Volkmann, 2010). Another application Dr. Bender developed aids in estimating potential risks of heart surgery (Ribot, 2010). There is also an app that allows healthcare providers to scan documents directly into a centralized system to ensure organization of medical records (Ribot, 2010). The Apple iPad is also used in medical practice as a way to access patient charts and other medical information, as well as an educational tool to explain and show videos of different medical procedures to patients and their family members (Ribot, 2010).

A recent study reported that internal medicine residents perceived improved workflow and efficiency when using an iPad to access electronic health records (Patel et al., 2012). More data is needed to understand the advantages and disadvantages of this technology in the inpatient medical setting. Healthcare providers were given iPads for use in the workplace. While no specific regimen of iPad usage was prescribed, one expected use was to provide portable access to patient electronic medical records (EMR). To assess exactly how the iPads were being used, healthcare providers completed an online survey. The survey sought to identify typical usage, likes, and dislikes of the tablet among the professionals in the pediatric hospital setting.

METHOD

Participants

Participants were recruited from Children's Mercy Hospitals and Clinics (CMH&C). A total of 354 participants responded to the survey with ages ranging from 24 to 70 years old (M = 41.73, SD = 9.98). 214 of the participants (60%) used the iPad to access the hospital's EMR.

When these participants were asked to describe their job, the majority were:

• Attending Physicians • Nurses • MIT/Nursing Informatics • Nurse Practitioners • Child Life Specialists • Dietitians • Speech Pathologists	• Fellows • Residents • Physician Assistants • Administrators • Coordinators • Psychologists • Different types of therapists

Materials

Participants were recruited through the hospital's email list. Survey responses were collected online via SurveyMonkey. The 31-item survey sought to identify typical usage, likes, and dislikes of the iPad. Participants were asked about their usage of the iPad for both work-related and non-work-related activities.

Procedure

The recruitment was accomplished through an email containing the link to the online survey. Participants read an electronic version of the consent form and indicated their willingness to participate by selecting "yes". Only those who agreed to participate were able to view the 31 survey items. The last section of the online survey contained demographic items such as age, gender, handedness, type of computer used, job description, and the specific area in which they work.

RESULTS

Work-Related Usage

Out of the respondents, 60% used the iPad to access EMR. Those who used it to access EMR reported that the main benefits include portability, convenience, and quick ease of access. Some participants also cited increased efficiency and battery duration as benefits of using the iPads for EMR access (see Figure 1).

Benefits

Figure 1. Benefits of using the iPad to Access EMR.

Figure 2 shows the satisfaction level of participants who used the iPad to access EMR. Results show that more than half of the participants had positive feedbacks for their experience with the iPad (49% were "satisfied" and 10% were "very satisfied"). Only a small percentage of the participants had negative feedbacks for their experience when using the iPad (12% were "dissatisfied" and 4% were "very dissatisfied"). The responses indicate that majority of those who used the iPad to access the EMR were satisfied with the device.

satisfaction

Figure 2. Satisfaction level when using the iPad to access EMR.

Participants were asked what EMR screens do they frequently access when using the iPad and the majority of participants appear to access 3 main screens, which are: Documents (82%), Contact Information (50%), and iView (43%). The rest of the EMR screens were accessed at least once a day by a minority of iPad users (see Figure 3).

EMR1perday
Figure 3. Frequently accessed EMR screens on the iPad.

Table 1 shows the top five work-related apps among those who use iPad to access EMR.

Table 1. Top 5 work-related applications

Application	Description
Citrix Receiver	ability to remote into the hospital's network or Cerner
Polycom	ability to do telemedicine over a secure network
Lexicomp	medication dictionary
Visual DX	ability to see different types of diagnosis
Adobe PDF Reader	ability to read documents

Those who did not use the iPad to access EMR provided several reasons for non-use and the most common reasons included: difficulty in entering information using touch keyboard, difficulty reading small fonts, constantly having to make the font bigger by touching the screen, inaccurate interaction due to small targets, and too much scrolling.

Non-work-related Usage of the iPad

Of the total 354 respondents, 68% used their iPads for non-work-related activities. Among those who used the iPads for both work-related and non-work-related activities, 68% thought it was easier to use the iPad for non-work-related activities compared to work-related activities. Most of those using the iPad for non-work-related activities used it primarily for email access (58%), organizing calendars (30%), and web browsing (28%). Less than 1% reported using their iPads for the following tasks: video conferencing, creating art, creating music, watching videos on YouTube, maps & navigation, and online banking (see Figure 4).

NonWork
Figure 4. Non-work-related usage of the iPad.

Table 2 shows the top five non-work-related apps among participants who used their iPads for non-work-related activities.

Table 2. Top 5 non-work-related applications

Application	Description
Evernote	Note-taking app
Cloud On	Ability to modify MS Office documents
Penultimate	Ability to write on the iPad with a stylus or finger
Angry Bird	Games
News Apps	Ability to read news articles from sources such as USA Today, CNN, etc.

Overall user-friendliness

Majority of the participants rated the user-friendliness of the iPad positively. Only 1.81% rated it poor, while the rest rated it fair (see Figure 5).

UserFriendliness (1)
Figure 5. Overall iPad user-friendliness ratings.

DISCUSSION

This study showed the hospital employees at the pediatric hospital who were given iPads used it for both work-related and non-work-related tasks. Participants acknowledged its advantages in the workplace due to its portability and convenience. Other advantages were quick access to patient information when they were conducting rounds and availability during doctor-patient

interaction to show medical images, test results, or to convey patient information to family members. The main issues with the tablet were reported to be difficult navigation of the complex EMR system on the small iPad screen and poor usability of the onscreen keyboard for entering information. Some participants pointed out wireless connectivity issues, but were aware that this particular issue is due to the hospital's wireless network rather than the iPad itself. Most participants who cited these difficulties indicated that the problems might not be due to the tablet device itself, but the fact that the EMR program they were using was complex and was not created for a mobile device.

Results indicate that mobile devices are used for both work and non-work-related activities among healthcare employees. Specifically, more than half of the participants used the iPad to access information and perform tasks on the EMR. These are indicative that tablet computers have promising potential in healthcare and offer affordances such as: portability, convenience, and quick access. However, using the iPad on an EMR system that was built as a desktop application limits these potentials because targets on the screens are not scaled to optimize touch interaction and the information presentation and layout were intended for a display with more real estate. There is a need, therefore, to develop applications for this platform to optimize utility of these devices.

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