Electronic Medical Record Adoption: Does usability help?

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Introduction

Macomb Hospital is a 100 bed hospital with 150 health care workers and they are getting ready to implement a new Electronic Medical Record (EMR) system. This research effort is sought to evaluate how easily the hospital adapts the new EMR system and how it correlates with the usability of the system. Rose et al (2005) examined EMR usability and the findings from both studies raised issues with the amount and organization of information in the display, interference with workflow patterns of primary care physicians, and the availability of visual cues and feedback. The usability of the EMR is a major factor when it comes to the hospital having a successful implementation, along with proper training. For example, EMR usability has been found to correlate with healthcare workers desire to use the system (Boone, 2010). HiMMS examined what makes a system usable, some of the key elements are simplicity, consistency, efficient interactions, and naturalness. My hypotheses behind this study are as follows:

H₀: The training will not help the hospital adopt the EMR easily and the EMR is not usable

H₁: The training will help the hospital adapt the EMR easily and the EMR is usable

Methods

Eighty two of one hundred and fifty-four employees attended training and were asked to fill out surveys. The survey questions will be answered with a ranking system and the same survey will be given before and three months after the training to compare the answers. The survey questions are as follows:

1. Different questions for before and after the training. (a: before, b: after)

   a. How would you rate your wanting to use the EMR? (1-no want, 5-want)
b. Now that you have been using EMR for a few months, how would you rate your wanting to use it? (1-no want, 5-want)

2. Do you think the new EMR will improve patient care? (1-no improve, 5-much improve)

3. Do you think an/the EMR system is easy to use? (1-not easy, 5-easy)

4. Will/Has this system make your work easier? (1-not easier, 5-much easier)

5. How would you rank the usability of the system (1-not usable, 5-very usable)

The dependent variable is the surveys and the independent variable is the results of the surveys.

The means of each question’s before and after results will be compared at a 5% level of significance. The appropriate test statistic is

\[ T_{stat} = \frac{\bar{x}_1 + \bar{x}_2}{\sqrt{s_1^2/n_1 + s_2^2/n_2}} \]

Results

For this investigation, all data was simulated.

| Group Statistics |
|------------------|-----------------|-----------------|
|                  | N               | Mean            | Std. Deviation | Std. Error |
| Group            |                 |                 |                |
| Before_After     | 205             | 2.61            | 1.265          | 0.899      |
| 2                | 190             | 3.29            | 1.378          | 1.036      |

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<th>Independent Samples Test</th>
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<td>Before_After</td>
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\[ T_{stat} = \frac{2.61 + 3.29}{\sqrt{1.265^2/205 + 1.378^2/190}} \]

\[ T_{stat} = 5.90/\sqrt{0.00781+0.0273} \]

\[ T_{stat} = 5.90/0.187 = 31.55 \]
From the results in the table above, the total mean of the before and after questions do not differ and $H_0$ is accepted.

Discussion

This calculation has shown that the EMR that was implemented in Macomb Hospital is not very user friendly and that training did not help the health care professionals. Since the total means of both the before and after were very close, there was not enough evidence to accept the alternate hypothesis. Some of the weaknesses to this inquiry are that only the employees that attended the initial training that were surveyed. There were trainings later on, closer to the go-live, for those who missed the initial training. Those people were missed with this data. The follow-up survey did not cover all of the employees that attended initial training. Some were on vacation, no longer worked at the hospital, etc. This made the data less reliable because the survey did not capture every health care professional in the hospital.

“Usability is the effectiveness, efficiency and satisfaction with which specific users can achieve a specific set of tasks in a particular environment” (Belden, Grayson, & Barnes, 2009). Creating an EMR system for a hospital is very difficult because there are many tasks to think about and the different people that will be using the system. The training of the system also affects how the system is used in the hospital. If the training is not good then the people will not use it to its fullest ability. Both the training and usability of the system are both explored a lot and used in statistics (Kushniruk, Myers, Norycki, & Kannry, 2009). Hospitals need to look at the usability of the system and how the employees are trained to have a positive result. To answer the question in the title, usability does make a difference and helps when implementing a new EMR.
References


http://www.himss.org/files/HIMSSorg/content/files/selecting_emr_eval_usability.pdf
