

Older Adults' Perception of Costs and Benefits of Web-Based and Mobile PHR Technologies: A Focus Group Approach

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Abstract. The goal of the study was to explore older adults perceived benefits and costs of relatively new personal health records (PHR) technologies: web-based PHRs versus mobile PHRs. Twenty-six older adults (ages 63-79 years) participated in a focus group. The results showed a significantly different cost-benefit relation between the PHR technologies. The results showed that older adults perceived more benefits than costs with web-based PHRs but more balanced costs and benefits with mobile PHRs. These results suggest that the adoption of e-health may be hindered by this lack of perceived benefits relative to costs.

Keywords: e-health, personal health records, older people, perceived costs and benefits, focus group.

1 Introduction

So-called “e-health” tools such as personal health records (PHR) enable patients to manage and share their health information [1]. Due to PHR, health consumers can be more proactive in the management of their health; more so for older adults and with chronic illness. Although older adults may have more difficulty using new technologies [2], it is not accurate that they are resistant to technology adoption. For older adults' adoption of new communication technologies (e.g. mobile phones) the absence of benefits is more influential to the adoption of email and cell phones compared to the perceived costs. Older adult's choices are based on a cost-benefit analysis, before deciding to make an investment [3].

There is currently no study, which has examined the cost-benefit-relationship between different technologies in a PHR context. Our goal was to use focus groups to explore how older adults perceive the benefits and costs of web-based PHRs compared to mobile PHRs.

2 Method

2.1 Participants

Twenty-six old participants (14 female and 12 male) took part in focus groups. They ranged in age from 63 to 79 years ($M=71$, $SD=4.9$). The participants had extensive computer experience. Although most of the focus group participants were aware of web-based health information tracking using PHRs, the majority were unaware that such information was also available on mobile phones.

2.2 Procedure and Material

In seven focus group sessions participants discussed two ways of accessing and maintaining personal health information: using a web-based system (Google Health website) and a mobile-based system (Google Health as iOS-based application (app) on a mobile device that access a Google Health profile).

After an introduction (e.g. “personal health records”) participants were given demonstrations of the Google Health website and the mobile app. Both systems were shown on a projector. Additionally the mobile system was demonstrated individually to each participant on a mobile phone. After each system demonstration the moderator led a discussion of costs and benefits of each system. Order of system presentation was counterbalanced.

Each system demonstration showed typical PHR usage scenarios based on earlier research [4]. In the discussion of motivational factors, the moderator specifically asked for benefits of using the technology (e.g. “Why might you use the Google Health website?”), followed by expected drawbacks of using the technology (e.g. “Why might you not use the Google Health website?”). Finally, participants were asked to discuss ideas and suggestions about what they would like to add to a hypothetical, ideal technology (a “magic box”) to better fit to their needs. Each session was audio-recorded.

2.3 Data Analysis

Transcriptions were analyzed with top-down enforcement of categories. Two independent coders reached an inter-rater reliability of 86% on a sample of the data.

We used a previously developed coding scheme [3] and used the responses of the participants to develop sub-categories of the coding scheme. Comments were coded along two dimensions: (A) the communication technology, which consisted of two levels “web-based PHR” and “mobile PHR” and (B) motivational factor as a consideration for using this method on two levels “benefit” and “cost”. Benefit was defined as an advantage or positive statement about using a method (e.g. keep “everything in one place”). Cost was defined as a disadvantage, or negative statement (e.g. “privacy issue”). The subcategories were mutually exclusive and were created from a portion of data. Additionally, we coded “desired features”, which were mentioned during the group discussion. Desired features were defined as a missing aspect which would give

a benefit e.g. “magic mouse to track out vital parameter” or a negatively stated comment about a benefit e.g. “for me it is not useful”.

For the statistical analysis we used the Fisher's exact test of a 2x2 table. The level of significance was set at 5%.

3 Results

3.1 Effects of Communication Technology (Web-Based PHR vs. Mobile PHR) on Cost-benefit Relationship

Perceived costs and benefits for the two communication technologies (web-based PHR vs. mobile PHR) were quantitatively contrasted. In 7 group sessions we gathered 342 comments. Of those, 150 comments were about the web-based application, while 192 comments were about the mobile phone application. The website averaged 5.8 entries per person and cellphone averaged 7.4. Participants, on average, made 12% more statements for the cellphone application than for the website.

The benefits category accounted for 60% of all the comments in comparison to 40% of comments about costs. For the web-based PHR, 66% of comments were about benefits and 34% were about costs. For mobile PHR 55% of comments were about of benefits in comparison to 45% of comments regarding costs.

Fisher exact test showed that the cost-benefit relation within the web-based PHR (benefits: 66%, costs: 34%) is significantly different from the cost-benefit relation within the mobile PHR application (benefits: 55%, costs: 45%) (Fisher's exact test, $p < .05$). Participants mentioned proportionally more benefits than costs for the web-based PHR in comparison to the more balanced cost-benefit-relationship of the mobile PHR.

3.2 Qualitative Analysis of Desired Features

Another technique to understand barriers to technology adoption is to ask what features are missing from existing systems. To that end, we asked our focus group participants to imagine a non-existent technology (“magic box”). Participants imagined what features an ideal technology would have without regard for any technological limitations. Desired features, which were mentioned in each technology, were “medication interaction warnings” and “diagnosis and prognosis”. An example which addressed web-based PHR were a “magic computer mouse to track continuous vital parameters”. Mentioned desired features for the mobile PHR were “voice commands”, “print possibility” or “security password for medicals e.g. in EMS-situations”.

4 Discussion

The present study supports the assumption of recent research [3] that older adults tended to associate using a relatively new technology in a PHR context primarily with its benefits. Twenty-six participants mentioned predominantly more benefits than costs for the website. In contrast, the cost-benefit relationship for the cellphone was balanced. This difference between the two systems suggests that our older adults, because of the maturity of web-based tools, are more able to see the benefits versus the costs. However, our highly experienced older participants may have more issues perceiving the unique benefits of mobile health applications compared to the costs. These results suggest that the adoption of e-health may be hindered by this lack of perceived benefits relative to costs.

With the view on the qualitative analysis of the subcategories, we can conclude that our sample of older participants are aware of general PHR related benefits and additionally of the unique characteristics of a communication technology. Whether this finding generalizes to most older adults is a topic for future research.

Further research may compare different age-groups. Although young people do not have as many health issues, they tend to be more familiar with mobile applications. Therefore the cost-benefit relations of both technologies may not differ between age groups. Additionally future research may approach to investigate different cultural effects. The participants in the study were all U.S. citizens.. They might be more familiar with the technologies than other cultures where technology adoption tends to be slower. Furthermore data from this study could be used to help better communicate benefits of this technology to older adults.

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