Personal Health Records: Identifying Utilization Patterns from System Use Logs and Patient Interview

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Abstract

Personal Health Records (PHRs) and patient portals are becoming more popular as health systems continue to emphasize patient centered health care delivery. Our study investigates the factors that influence adoption and utilization of PHR systems using a mixed method approach. Our data include PHR system utilization data collected about registered users of seven primary care physicians during the period between September 2009 and February 2011, as well as interviews of a subset of these users. Analyses of these data provide insights into how and why users interact with the system. They also assist in identifying ways to enhance the overall PHR portal experience for physicians and patients. In this paper, we present our preliminary findings and discuss potential future research directions.

1. Introduction

Health care providers, government and private industries are investing in health information technology (HIT) in the belief that it will support better health outcomes and reduce costs. Personal Health Records (PHRs) and patient portals are part of these HIT applications that can potentially increase quality and access to care [4, 13]. PHRs are viewed as tools that can increase health understanding and help transform patients into better educated consumers of healthcare [8]. Although the definition of PHR is still evolving [5], most of the definitions refer to PHR as a tool that helps management of personal health information, including storing and sharing health information [14]. The Office of the National Coordinator (ONC) for Health Information Technology (http://healthit.gov) distinguishes between standalone PHRs, which are fully managed by consumers of healthcare, and secure patient portals, which are PHRs connected (tethered) to a specific organizations’ (healthcare provider, insurance company, etc.) information systems and allow patients access to their own information with limited management abilities. Patient portals are being increasingly adopted with PHR adoption rates increasing twofold since 2008 [15].

As noted in the literature, PHR investments have focused on application development, with insufficient focus on evaluation and research [7]. In recent years, more funding from federal agencies and foundations is going towards understanding how and why patients use PHRs, but such research is still in the early stages. With the introduction and rapid adoption of mobile technologies, the ways in which individuals access PHRs and patient portals are changing. Hence, the need to better understand how PHR technologies fit into individuals’ day-to-day activities is still important [13].

The literature provides some reasons for individuals’ increasing interest in using PHRs. These include health reasons such as having chronic illnesses, caring for elderly parents or experiencing an unexpected “health event”; increased technology access from the availability of inexpensive computers and easy Internet access; and the role of federal and state regulations that have mandated patients’ access to their health records [3, 12]. To maximize the potential advantages of using PHR systems, it is essential to better understand why and how individuals utilize these systems.

In our study, we investigate the use of a patient portal system in a multi-site multi-speciality group medical practice over 18 months soon after the initial roll out of the system. Using system log data, we examine how patients utilize the system and how their gender, age, and health status affect that utilization. Combined with patient interview data, we study why individuals decide to utilize the system.

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and how their utilization frequency changes over time after they become a user. Finally, we investigate the potential impact of providers on system utilization. The remainder of this work-in-progress paper provides a brief overview of the PHR literature, followed by our methodology, preliminary results, and discussion and conclusions from these results.

2. Background

By using PHR systems, individuals gain better access to their own healthcare data and become stewards of their own information [5]. The features available in current PHR systems provide individuals with access to health information, medical history, medication list, billing information, and laboratory test results, and the ability to view and change appointments, refill medications and send secure messages to the provider team. The most popular features of PHR systems are access to lab test results, patient-provider clinical messaging and medication refills [5, 11, 16]. Individuals with chronic illnesses also valued personal tracking tools and disease specific features [1].

Individuals use these features because they provide a means of communication without the hassle of actually visiting the physician thereby saving time and money. Physicians and patients, however, differ in their preferred means of communication. For example, an online survey of registered users of the MyChart portal by Geisinger Health System found that patients preferred a combination of e-mail and in-person communication, whereas physicians preferred a combination of in-person and telephone communication [6]. Patient demand for email contact with physician practices is increasing. Physicians, however, are often hesitant to use email with patients, largely due to concerns relating to workload, security and lack of compensation. This reluctance of physicians to communicate via email with patients is being reduced with the assumption that their time will be compensated for email communications [9]. There have also been promising results achieved by some health systems such as Kaiser Permanente, which reports decreased rates of primary care office visits and telephone contacts due to the secure messaging feature of the patient portal [17].

While the literature agrees that patient demographics and health status affect PHR usage, it does not agree on those effects. On one hand, some studies report high PHR usage statistics and interest for patients with chronic illness, disabilities and those caring for elderly parents [12]. PHRs empower these users by helping them manage accurate health record history that can be accessible by any provider, even if they are unconscious in time of an emergency [10]. On the other hand, a study investigating the profile of patient portal users concluded that those who choose to use the portal “were younger and more affluent and had fewer medical problems than nonenrollees” [16]. This digital divide effect was also present in a recent survey reporting that higher-income individuals are the most likely to have used a PHR [15]. This same study, however, also reported that “lower-income adults, those with chronic conditions, and those without a college degree are more likely to experience positive effects of having their information accessible online” [15]. Gender and age effects have also been reported. For example, women are more rapid adapters of patient portals than men, and those aged 40-69 have the most rapid adoption rates [2].

To summarize, researchers have investigated PHR and patient portal adoption using survey data and system logs in several different settings. To the best of our knowledge, no studies exist that have combined quantitative data from systems and surveys with qualitative data from patient interviews to better understand the adoption issue. Our study examines quantitative system log data and uses qualitative patient interview data to explain how and why patients choose to use a PHR.

3. Methodology

3.1. Field Site

Our field site is a multi-site, multi-specialty group medical practice located in the northeast U.S., with about 250 physicians and 1,500 other employees. It serves 200,000 patients with over one million patient visits per year. The group practice has 25 clinic locations that utilize a well-respected EHR package, providing features to support ambulatory care clinics and a patient portal. The patient portal, which is a tethered PHR, was made available to all clinic patients starting in summer 2009.

3.2. Data Collection

We used two data sources in this study. The first data source was the patient portal system use logs. The second was interviews of patients about their portal use.

3.2.1. Patient Portal Use Logs

We collected patient portal use data from August 2009 to February 2011 for all patients in the care panels of 7 selected primary care physicians (PCPs),
who were internists or family practitioners. These PCPs had been previously selected for a different study that investigates the EHR implementation in this clinic. Overall, these 7 PCPs had 18,000 patients in their panels. Table 1 illustrates the number of patient portal users each PCP had when we started to collect data and when we completed data collection.

Table 1 – Change in Number of Patient Portal Users Over Time per PCP

<table>
<thead>
<tr>
<th>PCP</th>
<th># of Users in 08-2009</th>
<th># of Users in 02-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP1</td>
<td>31</td>
<td>81</td>
</tr>
<tr>
<td>PCP2</td>
<td>106</td>
<td>294</td>
</tr>
<tr>
<td>PCP3</td>
<td>78</td>
<td>219</td>
</tr>
<tr>
<td>PCP4</td>
<td>72</td>
<td>287</td>
</tr>
<tr>
<td>PCP5</td>
<td>34</td>
<td>116</td>
</tr>
<tr>
<td>PCP6</td>
<td>205</td>
<td>492</td>
</tr>
<tr>
<td>PCP7</td>
<td>15</td>
<td>134</td>
</tr>
<tr>
<td>Total</td>
<td>541</td>
<td>1,623</td>
</tr>
</tbody>
</table>

The system use logs tracked information on the users (listed in Table 1) who are using the patient portal and the number of logins and features accessed by each user every time they logged into the system. Using these logs, we were able to determine for all users how many times each user logged into the system each month and how many times they clicked on a feature in a month. The data we received also had information about how many different days and hour intervals the clicks occurred. For example if a user had 10 counted clicks for the month of January in the login column, we were able to identify if these clicks happened in a single day or were spread across multiple days.

3.2.2. Patient Interviews

The second data source was 40 interviews we conducted with selected patients of the 7 PCPs. To adequately sample patients across physicians, we selected more users for the PCPs who had higher numbers of portal users overall. Thus, we started our sampling by determining the total number of patients who signed up on the patient portal for each PCP over a five-month period (August, 09 – December, 09). Based on the total number of portal users of a PCP, we chose the number of subjects to interview from the patient portal user population of that PCP (see Table 1). Table 2 presents the number of subjects interviewed for each PCP.

Table 2 - Interview Subjects

<table>
<thead>
<tr>
<th>PCP</th>
<th># of portal users interviewed</th>
<th># of non-users interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>PCP2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>PCP3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>PCP4</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>PCP5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>PCP6</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>PCP7</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>4</td>
</tr>
</tbody>
</table>

Next, we developed selection criteria for interview subjects. To ensure responses from different user groups, we identified dimensions that are commonly used to determine different patient groups: age (4 groups), gender, and health status (well, chronically ill). We added system use frequency to this list. When we were defining frequency of use for our study, we took into account different ways patients can interact with their healthcare providers. For a healthy patient, we expected to see a yearly visit for an annual exam and a few visits for acute conditions. For chronically ill patients, we expected to see an increase in the frequency of visits based on the severity of their condition. We defined frequency using a ratio, the total number of months a patient logged into the system at least once divided by the total number of months the patient was a system user. If this frequency ratio was less than or equal to 0.33, we defined the patient as a rare user (RA); if the ratio was larger than 0.33 but less than or equal to 0.66, as a regular user (RE); and if the ratio was higher than 0.66, as a frequent user (FR). In other words, a patient who has been a user for the last three months would be categorized as a rare user if s/he logged into the system one out of these three months, a regular user if s/he logged into the system two out of these three months, and a frequent user if s/he logged in during all three months. We also took into account the type of patients PCPs have in their patient panel. For example, if a PCP was serving in a clinic with a higher number of elderly patients, our sample for that PCP included more patients in the 65+ age group.

A research nurse identified portal users that met the selection criteria. Selected users received letters from the clinic inviting them to participate in the study. Those who responded positively received a phone call from the research nurse to schedule an interview. The interviews started in October 2010 and ended in May 2011 after we reached 40 subjects. Patients received $50 for participating in the study. During the interview process, we had fewer than 10 no shows. Some no shows were due to confusion at the registration desk and were rescheduled. Table 3
shows the distribution of our final subject pool based on the criteria.

Table 3 - Characteristics of 40 Interview Subjects

<table>
<thead>
<tr>
<th>Use Health / Gender Age</th>
<th>FR</th>
<th>RE</th>
<th>RA</th>
<th>NU</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 18-35</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>F 36-50</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>F 51-65</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>F 65+</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>M 18-35</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>M 36-50</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>M 51-65</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>M 65+</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

(Use: FR: Frequent User, RE: Regular User, RA: Rare User, NU: Non User; Health: W: Well, CI: Chronically Ill)

3.3. Data Analysis

3.3.1. Analysis of Portal Use Logs

Before starting the analysis of use logs, we first determined which unit of data to use. As indicated earlier, the total number of clicks a user generated in a month was presented in different forms giving us the ability to determine the different days and hour blocks they utilized the system. We analyzed how these three different representations of data (simple count of clicks, count of different hour blocks the clicks occurred, and count of different days the clicks occurred) related to each other.

We ran correlations between these three columns for the login feature only. Our goal was to determine if users were logging into the system multiple times during the same day and not accessing the system the rest of the month or if they were using the system regularly during the month. We ran correlations for the login click counts (simple count, day, hour) in the month of September 2009 for all users. The results, shown in Figure 1, indicate a strong correlation between all three data representations, that is, the higher the number of login clicks the higher the number of different hours and days these clicks occurred. Therefore, we used the “day” count for the analysis of system use.

To study the features used, the monthly data were consolidated to create a summary profile for each user per PCP. The summary profile was then divided based on the age and gender to generate reports to assist in analysis.

3.3.2. Analysis of Patient Interviews

We used the NVivo software package to support our coding and analysis process of the patient interviews. The research team met weekly to review the coding process and emerging findings. Early interviews were coded by two coders. After consistency was established, each interview was coded by one researcher. During this process, we also turned to the literature to assess how the emerging concepts related to existing literature.

Our initial coding revealed how and why patients were using (or not using) the patient portal. In this paper, we report these qualitative interview data to support and explain the findings from our system log data. As we continue coding, our data are beginning to reveal (1) the value of PHRs for patients and how they talk about value, (2) the impact of PHR on their relationship with PCPs, and (3) the perceived change patients observed in quality of care as a result of PHRs and how the patients interpreted quality of care. Some initial results on these three themes are also reported in this paper along with how age, gender, health status and usage relate to these patient perceptions.

4. Results

We observed a steady increase in users over time during the 19 months we collected use log data. Figure 2 presents the changes in number of total users over time per PCP. We observed that some providers were slower to bring in new patient portal users even though their panel sizes were comparable to the providers with fast user growth. This finding indicates that providers can have an important impact.
on the adoption of patient portals and requires attention.

From this point on, we will present our preliminary results from system log analysis and how the qualitative data we collected support and explain these findings. The quotes from our subjects are followed by the subject number (P1 indicating patient 1), the PCP responsible for their care (patient of PCP1), their gender (F-female or M-male), and the age group to which they belong.

4.1. Frequency of Use

Our analysis of usage statistics indicates that most users are either regular or frequent users (as defined in section 3), as shown in Figure 3. That is, most users utilized the patient portal at least 2/3 of the months they have been a user. The definition of frequency, as explained in section 3.2, should be kept in mind while interpreting these results.

This finding indicates that most patients who become users of the patient portal are actually using the system. When we asked users during the interviews why they decided to use the system, almost all of them mentioned that it was offered to them during a visit and they decided to try it out. They did not mention any other specific reason. However, as indicated above, most of them then used the system on a regular basis. This may be due to the fact that users found the system valuable in managing their health information and conditions.

![Figure 2 - Change in number of users over time, by PCP](image)

We observed that for some PCPs the percentage of rare users was higher (see Figure 3). During our interviews with the providers, we noted differences in the way each PCP envisioned how patients would utilize the portal. Combined with our observation about differing rates for adding new users, the impact of providers’ beliefs on patients’ utilization is an area we will continue to investigate.

4.2. Patterns of Use

The interview data revealed different use patterns that we could see in the use logs but did not know what triggered them. One common pattern is among patients who have regular and frequent interactions with the clinic.

“I’d say about once a month. But in the past when I had a lot of appointments and stuff, I would use it weekly, just to keep track of what I’ve got coming and going.” (P13, patient of PCP4, M, 65+)

“It probably had been, I’d say two months or so. And so maybe once a quarter or something, just to keep checking appointments. I don’t know, as I get older, I find I have more appointments more frequently. So I have to look at it more often, and then you say, I’ve forgotten.” (P10, patient of PCP4, M, 51-65)

“Probably almost every day, at least once a day, every day, just to make sure like, because I have problems with forgetting and remembering things, so I use it as a reminder multiple times a day, so that I don’t, so that I kind of put it in my mind so I don’t forget about it.” (P9, patient of PCP7, F, 18-35)

Patients found the system to be reassuring and convenient in most cases. Convenience was mostly described by the ability to have access to medical data or to check appointments or renew prescriptions without having to call the clinic.
“Usually I, if I need to double check my appointment, it’s there, which is fantastic. I know that my appointments listed. I don’t have to call anyone.” (P14, patient of PCP3, F, 36-50)

Like, three times a week. Seriously, I’m not kidding, like, three times a week. Because you, like, to renew prescriptions, instead of calling and waiting on the phone, I’m very busy at work. So what you do is you just go on [the system] any time of the day. You know, it’s not like you’re limited to the times that the phone’s open. So, like, if I need prescription for my son, you know, I just go onto his, you know, my son1 needs a refill on his epi pen, my son2 needs a refill on his asthma meds, and then you just send it. And then they just, you know, send me back and email saying it’s all set. But I can do it at night, you know, I work ’til 5:00. They’re closed at 5:00, you know? (P19, patient of PCP4, F, 18-35)

Rare users did not use the system often because (1) they did not view the system as helpful to them or (2) the system did not have the interactive features they hoped to see.

“I have to be honest, [I use it] infrequently. Perhaps quarterly. As a healthy individual, I just don’t use it probably for what it’s set up for. I had an appointment this morning in [clinic location] with dermatology, and I did go online to just make sure that that their appointment matched what I had in my calendar, and I’m sure you might get into some wishes later. I wish it had sent out a reminder, an email reminder. But I do use it infrequently, yes.” (P4, patient of PCP2, M, 36-50)

Some reported that they were in good health and hence the system did not provide them anything they needed to check frequently or regularly beyond the annual physical exams.

“I would say average maybe four times a year, if that. I’m in pretty good health so I don’t go to the doctor’s very often.” (P31, patient of PCP5, M, 51-63)

Others thought that they did not know enough about the system to use it more frequently. From our interviews we learned that even though almost all patients reported that the system was very easy to use and learn, they were not aware of all the functionality it provided. This lack of knowledge was one of the reasons why rare and regular users did not utilize the system more often.

“Actually, in the end, very little. When this thing came up, I was thinking that, I probably should be using it more. But it just doesn’t pop into my mind to go on it and use it. I probably am not even familiar with all the things it offers. I know you can get in and look at your current schedules and where your appointments are. And some of the information, not all of it. That’s probably about as much as I know about the site. I consider it an unutilized resource.” (P7, patient of PCP1, M, 51-65)

4.3. Triggers of Use

We performed some additional analyses to understand further the triggers of portal use. Specifically, we examined the features utilized by users and compared these based on their use frequency. Every “Feature” corresponds to a separate action or event, such as “Messaging”, “View lab test results”, and “View appointment”. The most popular features utilized by all patients were related to Appointments, Lab Results, Messaging, Medication renewal and Medical history. This finding about the most used features aligns well with the findings of other studies [1, 5, 11].

By looking at the features utilized most frequently, one can predict that the trigger of use will be an upcoming appointment, a scheduled lab test, or a recent visit to the clinic. Considering that messaging was another highly used feature, we can also predict that existence of non-critical medical concerns can also trigger portal use.

These predictions were confirmed by our interviews. The interview data also indicated that most users were accessing the portal to manage their interactions with the clinic. Three key triggers to patient portal utilization were having one of the following three conditions, chronic illness, pregnancy, or an acute illness that required frequent interactions for a short period of time.

“I was using it weekly because I had to get tested a lot. And it helped me keep track of my pregnancy, you know, when I went in for visits and my urine tests and my weight and all that stuff.” (P23, patient of PCP6, F, 18-35)

“When I make some lab work, and I check, too, if they put some results in the computer, so I’m checking in the computer. Or if I have appointments, and I don’t remember the name of the doctors or something like that, or the address, or the dates. So I have all the information in [the system], so I go there.” (P15, patient of PCP3, F, 36-50)

“I mean, [the use is] obviously more if we’re coming up to a doctor’s appointment, and then right after it, versus we’re supposed to be healthy for a while.” (P30, patient of PCP6, F, 51-65)

“I use it for three purposes. And it’s only when I’m doing one of those three reasons. I don’t just go on and log into it to look at it all the time. I use it when making appointments, if I’m having symptoms that I don’t want to go in for appointments, I just want to email the doctor, should I come in. I use it for that. And I use it for if I’m curious about history of, like, an immunization or something. And in terms of
time, I’ve maybe used it maybe 30 times since I’ve had it." (P22, patient of PCP6, M, 18-35)

Our data revealed another interesting finding about features. The descriptive statistics, illustrated in Figure 4, show that all users, regardless of their use frequency, access on average 6-8 features of the system every time they logged in. This finding indicates that irrespective of whether a user logs-in once in 6 months or every month for 6 months, he/she utilizes the system in a similar way. One difference is that the average number of features accessed by rare user patients of PCP1, PCP3, PCP5, and PCP7 was below the overall average for rare users. These four providers are also the ones that have the fewest total patients who are portal users. This difference is something we will be investigating further in our study.

**Figure 4** - Average number of features accessed by users

![Figure 4](image)

4.4. Gender and Age Effects

We analyzed the gender and age group differences within our user population to better understand the effects of such demographic characteristics on patient portal utilization. Gender analysis revealed that overall there are more female portal users, as shown in Figure 5. Moreover, for the majority of the providers, the percentage of female users was higher than that of male users. This usage pattern is similar to an earlier study [2]. However, for PCP1 and PCP4, the percentage of male users was higher than that of female users. This difference may be a reflection of these PCPs’ patient panel.

**Figure 5** - Distribution of ALL users for all PCPs based on gender

![Figure 5](image)

We also examined the gender effect based on use frequency to see if the overall trend is evident in different use frequency groups. In other words, we checked whether this same percentage of females and males was reflected in frequent, regular and rare utilization user groups. As Figures 6, 7, and 8 indicate, there are some differences between these user groups and we need to look into this difference further in our detailed analysis.

To study the influence of age on system use, we examined which age group, among the four age groups of 18-35, 36-50, 51-65 and 65+, has the highest portal utilization. As shown in Figure 9, the younger age group (18-35) — those supposedly more comfortable with the technology — was a minority compared to the other age groups. This result held across all PCPs. This age group analysis result is contradictory to the usual belief that the majority of users would be comparatively younger.

**Figure 6** - Distribution of Frequent (FR) users for all PCPs based on gender

![Figure 6](image)
We also examined the frequency ratio by the four age groups, as shown in Figure 10. The results clearly show that the age group of 65+ is the one that accessed the system the most across all PCPs.

5. Discussion

Our preliminary analyses provide interesting findings and research directions on patient portal frequency and patterns of use, the relationship between age and system utilization, and the potential impact of providers on system utilization.

We looked at frequency of use to understand how often the patient portal was utilized given that it was a completely voluntary system providing useful personal health information and functionality for healthcare consumers. Based on the frequency of use analysis, we can conclude that a majority of individuals who chose to become a patient portal user continue to utilize the portal regularly even though their initial reason to sign up was not triggered by a specific need. This may imply that once consumers become portal users, they can understand the value of the system better and utilize it as frequently as their health conditions require.

While investigating patterns of use, we learned that the most commonly used features do not change based on frequency of use. Moreover, individuals who are rare users utilize the same number of features as frequent or regular users even though they log into the system less frequently. This implies that the system features that provide value to the users are not dependent on how frequently the system is utilized.

We looked at the users’ age to understand if it could be a predictor of system use. Contrary to the findings of other studies, a majority of our patient portal users were older adults. Moreover, the system use frequency of older patients was higher than the frequency of younger patients overall. Similar to the other studies in the literature, our analysis also confirmed a larger percentage of female users although this higher percentage of females could be influenced by the patient panels of the providers and hence requires further investigation. These
preliminary findings encouraged us to look at system features from an age group perspective. We learned from the frequency analysis that once users login to the system, they continue to utilize it. If older adults are more likely to agree to become users, this could be due to the expected value from the patient portal to assist them with their frequent interactions with the healthcare system. If the goal of the patient portals is to help better manage health (not just health information), the systems should include features that support preventative care and healthy living as these tend to be the features that could attract younger and healthier adults, thus encouraging more frequent use across the age spectrum.

We investigated the potential impact of healthcare providers on patient portal utilization because we hypothesized they played a significant role in encouraging consumers to utilize the system to motivate better health management. Our preliminary analysis showed variations in the percentage of portal users among the panel of patients for each PCP. During the interviews, we also realized that some PCPs, and their staff, encourage portal utilization while others are less likely to talk about it. Given that primary care physicians are one of the nodes that can influence health behavior, this is an area we will continue to investigate through our interviews with providers and further analysis of the patient interview data.

6. Conclusion

While we know within the information systems literature that usefulness, ease of use, training, gender and age trigger and influence system use, we do not know what these general findings mean for PHR use. For example, younger users are more frequent technology users in general and faster in adopting technologies compared to older users. However, in the context of personal health information management within healthcare, younger adults are healthier compared to the older adults and thus the affect of age may be different in the case of PHRs. Because the healthcare context, specifically personal health management through technology, is different than an organizational setting for implementing information systems, testing the generally accepted findings in this context provides important contributions to the literature.

Our preliminary results are broad in nature but still provide pointers for improving the overall portal experience. The portal can be designed to accommodate needs of the elderly since they use the system more than the other user groups. System utilization can be improved by educating users about the system features and their benefits. System utilization can also be improved by providing more customizable features that engage users regularly in their health. Analysis of the user-system interaction and its effect on patient-provider interactions and individual health behaviors can help in increasing the PHR adoption rates by informing implementation decisions and system design.

In addition to themes identified earlier, our qualitative data revealed some interesting results about the value of the patient portal for its users. Convenience and increased access to medical records were two motivators for continued use of the system. All users we interviewed thought the system was easy to use and user friendly. When we asked about specific features, some of them thought that the features did not exist or they did not notice them. This finding has implications for how health systems provide education about the system features and the benefits individuals can receive through system use.

As we continue to analyze the qualitative data, we will be focusing on the value of the system for patients and providers. Utilization of certain features such as secure messaging can be linked to changing interactions between physicians and patients. Our preliminary analyses indicate that even simple features such as viewing laboratory results can change the way patients interact with their physicians. Features that inform patients about their health and current conditions may have an influence on individuals’ health behavior and how they interact with their physicians.

Finally, our results demonstrate the advantages of using multiple sources of data. With the system log data, we can analyze many users, and so can reveal clear trends. To complement these results, the qualitative interview data helps us explain and understand the quantitative results, so that we can understand why patients are using (or not using) the patient portal.

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8. References


