Development of an Educational Program to Increase Patient Involvement in a Healthcare Patient Portal: A Quality Improvement Project

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ABSTRACT

Background:

Efforts in the United States to improve patient engagement and communication with health care providers have led to the creation of the meaningful use program. [1] The Centers for Medicare and Medicaid Services have created a three-stage process to encourage the adoption and use of electronic health records (EHR). Benefits of EHR use include the ability to provide accurate, up-to-date, legible, and complete information about patients at the point of care. One important component of EHR is the patient portal. Patient portals provide 24-hour access to portions of a patient medical record as well as a secure pathway to send messages to providers, ask for refills of medications, and schedule appointments.

Objective:

The objective of this project was to assess if patients who have not used the patient portal will engage in using the portal after an in-office orientation on how to access and the benefits of using the patient portal.

Methods:

A quality improvement project was performed using a convenience sample of 60 participants who were scheduled for an appointment in an outpatient cardiology office and had not accessed the patient portal in the past 12 months. The participants were given a survey regarding their computer and internet access as well as their level of comfort using a computer. Each participant was assisted in creating a username and password as well as a security question and answer. The participant then accessed the portal and navigated through the portal with the guidance of the nurse practitioner. They also sent a message via the portal to the provider they were assigned to that day. Each participant was given a pamphlet and a printed power point to reinforce what they had learned. After two months, the nurse practitioner accessed the portal to determine if the enrolled participants had accessed the portal. The reasons for access and frequency were recorded. If there was no access, the participant was called by the nurse practitioner to determine the reason they had not accessed the portal.
Results:

Of the 60 participants, 54% were women, 46% men, 93% were Caucasian. Fifty-six point seven accessed the portal from home. Reasons for access included: 85% reviewed labs, 53% reviewed messages sent to them from the office and 23% sent messages to the office. Twenty-four participants did not access the portal. Of those participants, 33% stated that they had no clear reason to access the portal, 25% stated that they forgot their login information and 17% stated they no interest in the portal.

Conclusions:

Patient portals are a useful tool for communication between patients and their providers. Providing an in-office orientation to the portal increased patient access to the portal.

KEYWORDS:

Internet use, elderly and computers, computer learning, electronic health records, patient portal

Introduction

Efforts in the United States to improve patient engagement and communication with health care providers have led to the creation of the meaningful use program. Meaningful use is defined by the Office of the National Coordinator for Health Information Technology [1] as “using certified electronic health record technology (CEHRT) to help engage patients and family in hopes of improving public health, by promoting an increase in quality, efficacy and security of patient records, while reducing health disparities.” In 2011, The Centers for Medicare and Medicaid Services created a three-stage process to encourage the adoption and use of electronic health records (EHR). Stage one involved the foundation of EHR Incentive Programs. Objectives included defining requirements for capturing clinical data electronically and sharing electronic copies of health information with patients. Stage two
built upon the first and focused on advancing clinical processes while confirming that the EHRs were supporting the set goals. In 2015 a final rule was created that relaxed reporting requirements and established stage three, which focused on using CEHRT to improve patients’ health outcomes [1]. Benefits of EHR use include the ability to provide accurate, up-to-date, legible, and complete information about patients at the point of care. One important component of EHR is the patient portal. Patient portals provide 24-hour access to portions of a patient medical record as well as a secure pathway

Medicare eligible providers (EP), who have not successfully converted to an EHR that demonstrates the ability to achieve the meaningful use criteria, may find their practice penalized financially. CMS notes a penalty fee schedule [2] that reduces the amount covered for professional services by 1% annually and that increased each year the EP does not meet meaningful use criteria. The maximum yearly reduction will be 5% annually.

To date, there are few studies regarding patient portals and their benefits on patient outcomes. Solomon et al. [3] in a randomized controlled trial studied 201 adults with chronic conditions were randomly assigned to two groups. The control group was given access to a health education website where they could access information about various topics. The intervention group had access to an interactive patient portal. Activation levels were evaluated using a Patient Activation Measure (PAM) survey pre- and post-intervention. The definition of patient activation used for this study was a measure of self-management capabilities. The study found evidence that the patient portal intervention group had increased patient activation which supported potential improvement in the self-management abilities of chronically ill people.

Green and Hibbard [4] conducted a cross-sectional study of patients at 35 primary care clinics utilizing a PAM survey to evaluate their patients’ activation levels. They defined patient activation as having the knowledge, skills and confidence to manage one’s health. The results of the study found that patient activation levels were strongly related to a range of health-related outcomes. They noted activated patients were more likely to have healthier body mass indexes (BMIs), be less likely to smoke and more likely to receive preventative
A systematic review by Kruse, Bolton and Freriks [5] reviewed 27 data-driven studies that evaluated relationships between patient portal use and outcomes. They reported that 37% of those studies documented improvement in medication compliance, an increase in the degree of interest in the patient’s disease process as evidenced by requests for more detailed information during office visits, and an increase in customer retention and satisfaction.

Green et al [6] evaluated a group of patients with hypertension. Their study created three groups for comparison of improvement in blood pressure (BP) management. The first group received usual care which included provision of educational materials on blood pressure management and goals. They were also informed when their blood pressures were not at goal. They were then instructed to follow up with their provider for management. Both the second and third groups performed home BP monitoring and received web services training. The web services included ability to send secure emails between providers and patients, request medication refills, view portions of their electronic health records and access to a health library as well as links to community resources for lifestyle and behavioral changes. In addition, to services provided to group two, the third group, through secure web communications had pharmacist directed adjustments in medications in response to BP monitoring results. The study found that group three was more engaged in their health care and had a 25% higher number of patients with controlled blood pressure when compared to the usual care group and 20% more patients when compared to group two. These results support the theory that when patients become more engaged in their care, there will be improvement in health outcomes. It also supports that patient use of secure messaging with clinicians has value when working toward health goals.

Sarkar et al. [7] observed that patients who utilized a patient portal program to request prescription refills were more likely to adhere to taking their statin drugs. They measured time between refills and by identifying the refill request method. They found improved low-density lipoprotein cholesterol (LDL) levels in those who adhered to statins and concluded that the use of the patient portal for prescription refill request aided in the decreased LDL levels.
In a study by Lau et al. [8], patients diagnosed with diabetes were assessed for improvement in hemoglobin A1C results by comparing individuals who had used a patient portal to those who did not. The study was unable to identify the actual features used by the patients however the portal did allow patients to review laboratory results, write journal entries, send and receive secure emails from providers and provided access to general educational items. The study found that 56% of the patients who used the portal were able to lower their hemoglobin A1C level to below 7% compared to 32% of the non-portal users. The researchers noted that participants voluntarily enrolled in the portal and may therefore have a higher likelihood of using the portal due to self-motivation and desire to self-manage their diabetes.

One key step to increased patient involvement is the creation of a patient portal account and navigating it successfully. Goel et al. [9] recorded 159 respondents’ answers regarding patient portal use and perception of its benefits. The patients were given general information about the available portal and activities they could perform on the portal. Thirty days after receiving the information, the patients received a call to determine if they had tried to sign into the portal. They found that 26% percent of the participants did not remember discussing the portal with a provider while 63% of those who did recalled the discussion failed to attempt enrolling. Of those who remembered the conversation, 60% cited lack of information or motivation in regards to the portal program.

Currently many hospitals and their affiliated outpatient offices have patient portals. The office utilized in this project had a patient population of 4973 of which only 13% were registered with the patient portal. Of those patients registered with the portal, only half had accessed the account from home.

Objectives

The objective of this project was to assess if patients who have not used the patient portal will engage in using the portal after an in-office orientation on the benefits of using the patient portal and how to access and navigate the portal.

AIMS
The aims of this project were to (1) develop a process to introduce patients to the use of a patient portal, (2) implement a patient education program to orient patients on the benefits of using a patient portal, how to access it from home and navigate the portal and (3) evaluate whether patients accessed the portal two months after creating a portal account and receiving and orientation session.

Methods

Design

A quality improvement project with participants (n=60) recruited from a single outpatient cardiology office in a rural area by convenience sample.

Participants

A convenience sample of 60 patients was used. Inclusion criteria included >18 years of age, being able to speak and read English or have someone with them who does, internet access at home and have not signed into the portal within the past 12 months.

Procedure

Written materials were developed including an inclusion eligibility survey, a Likert scale survey to evaluate the participants comfort with using a computer, a survey to determine the reason the patient has not used the portal and a tutorial on how to use the portal. In addition, a currently existing pamphlet used by the office staff informing the patient of the patient portal was given to each participant. The project occurred over a four-month period of time. The first two months involved recruitment and education of the patients. Patient participation in the portal was assessed following the second two months.
**Intervention**

Initially participants completed the Likert scale survey to determine their comfort level with computer use. The participants were then provided education materials that described the benefits and usefulness of the patient portal. A portal user name and password were created for each participant under the guidance of a nurse practitioner. Following user credential creation, a ten-minute tutorial session was conducted to orient the participant to the portal. The tutorial included how to navigate through the various sections of the portal including sending and reviewing portal messages, reviewing lab and testing results, and requesting appointments. The participants created a brief message to the provider they were seeing that day. A staff member then responded to the participant within 48 hours. This action established the ease and effectiveness of the messaging system. Any questions about the portal and orientation process were answered, and a phone number to call for assistance with portal issues was provided. Participants were provided with a printed copy of the tutorial power point along with a brochure about the portal.

**Assessment**

Two months after establishing a portal account the participant’s account was reviewed for episodes of participant access. If the account had not been accessed, a phone call was made to the participant and the original survey regarding reasons for not using the portal was reviewed. Reasons given for not accessing were recorded. At the two-month review if a participant had signed in the frequency and reason for signing in was recorded.

**Results**

**Participant demographics**

Participants were almost evenly divide by gender with 53.3% female (32/60) enrolled, predominantly Caucasian 93% (56/60) and mostly over the age of 51 years old (52/60) (Table 1).
Table 1. Demographics of participants.

<table>
<thead>
<tr>
<th>N=60</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td></td>
</tr>
<tr>
<td>18-35</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>36-50</td>
<td>6 (10%)</td>
</tr>
<tr>
<td>51-65</td>
<td>20 (33%)</td>
</tr>
<tr>
<td>66+</td>
<td>32 (53%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>56 (93%)</td>
</tr>
<tr>
<td>Black</td>
<td>3 (5%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>32 (53%)</td>
</tr>
<tr>
<td>Male</td>
<td>28 (46%)</td>
</tr>
</tbody>
</table>

Of the 60 enrolled 73% (44/60) used the computer daily, while 13% (8) used it weekly or rarely (8). Prior to orientation 40% (24/60) reported they were aware of the portal (Table 2). All participants had access to a computer and internet. Four of the participants had enrolled in the portal in the past but not logged in over the past 12 months. Reasons for not signing were; forgetting their login information, needing help navigating the site, having no clear reason to sign in and expressing no interest in using the portal.

Table 2. Pre-orientation computer use and knowledge of portals existence.

<table>
<thead>
<tr>
<th>N= 60</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you use your computer online?</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>44 (73%)</td>
</tr>
<tr>
<td>Weekly</td>
<td>8 (13%)</td>
</tr>
<tr>
<td>Rarely</td>
<td>8 (13%)</td>
</tr>
</tbody>
</table>
Did you know about the portal before today?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>24 (40%)</td>
</tr>
<tr>
<td>No</td>
<td>36 (60%)</td>
</tr>
</tbody>
</table>

**Likert scale results**

**Pre-orientation results**

In regard to comfort with computer and internet use the participants reported feeling confident navigating the internet 90% (54/60) of the time and confident using a computer 85% (51/60). Participants agreed that using a computer can improve their lives 68% (41/60) of the time. Eighty percent (48/60) of the participants used their computers to communicate with others and a large portion, 92% (55/60), agreed that computers can help them learn. Of all participants 8.3% (5/60) reported feeling anxious related to using computers (Figures 1-6).

I can navigate the internet to find information.
N=60  
1= strongly disagree, 5 = strongly agree

![Bar chart showing Likert scale responses for internet navigation](image)

Figure 1. Participants Responses Regarding Internet Navigation.
I feel confident using a computer at home.
N=60    1 = strongly disagree, 5 = strongly agree

Figure 2. Participants Responses Regarding Confidence Using a Home Computer.

Using a personal computer can improve my life.
N=60    1 = strongly disagree, 5 = strongly agree

Figure 3. Participants Responses Regarding Use of Computer Can Improve Their Lives.
I use a computer to communicate with friends and family.

N = 60  
1 = strongly disagree, 5 = strongly agree

![Bar Chart](Chart1.png)

Figure 4. Participants Responses Regarding Computer Use to Communicate With Others.

Using a computer can help me learn new things.

N = 60  
1 = strongly disagree, 5 = strongly agree

![Bar Chart](Chart2.png)

Figure 5. Participants Responses Regarding Computer Use and Learning New Things.
Two-month post-assessment

Originally there were 60 participants enrolled in the project, however two were lost prior to the 2-month post assessment leaving 58 participants. One participant had changed her phone number without providing new contact information and the second had died prior to 2-month assessment.

At two months 34 of the 58 participants (56%) enrolled had accessed the portal. Of those who signed in, men represented 53% (18/34) and the most represented age range was 66+ at 50% (17/34) (Table 3). Reasons for accessing the portal included; reviewing labs 85% (29/34), reading messages 59% (20/34), sending messages to office 27% (9/34), and requesting an appointment 3% (1/34) (Table 4).
Table 3. Comparison of participants who enrolled vs. participants who signed in after orientation.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Pre-orientation N=60</th>
<th>Post-orientation N=34</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28 (27%)</td>
<td>18 (53%)</td>
</tr>
<tr>
<td>Female</td>
<td>32 (53%)</td>
<td>16 (47%)</td>
</tr>
<tr>
<td><strong>Age in Years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-35</td>
<td>2 (3%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>36-50</td>
<td>6 (10%)</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>51-65</td>
<td>20 (33%)</td>
<td>14 (41%)</td>
</tr>
<tr>
<td>65+</td>
<td>32 (54%)</td>
<td>17 (50%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>56 (93%)</td>
<td>33 (97%)</td>
</tr>
<tr>
<td>Black</td>
<td>3 (5%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4. Reasons participants signed into portal at 2-month review.

<table>
<thead>
<tr>
<th>Reason (N=34)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewed lab/test results</td>
<td>29 (85%)</td>
</tr>
<tr>
<td>Read a message from portal</td>
<td>20 (59%)</td>
</tr>
<tr>
<td>Sent a message to provider</td>
<td>9 (27%)</td>
</tr>
<tr>
<td>Requested an appointment</td>
<td>1 (3%)</td>
</tr>
</tbody>
</table>

Of the participants who signed in to the portal, 88% (30/34) had reported confidence using the computer and 94% (32/34) reported confidence in navigating the internet.

Forty-one percent (14/34) of participants signed into the portal once, 20.6% (7/34) signed in 2 times and 38.2% (13/34) signed in three times or more over the 2-month period.

The remaining 24 participants did not access the portal over the 2-month time span. Each of those participants spoken to and confirmed they had no change in the previous answers to pre-enrollment Likert scale survey. They also confirmed continued access to a computer and internet.
Of those who did not sign in 58% (14/24) were women and mostly older than 66 at 54% (13/24) with the next highest age range being 51-65 years old representing 25% (6/24).

Of those participants who did not access the portal, 79% (19/24) reported confidence using the computer and 83% (20/24) reported confidence in being able to navigate the internet. Eight percent (2/24) reported anxiety related to using computers. Eight respondents out of twenty-four (33%) reported they had no clear reason to sign into the portal over the two-month period. While 25% (6/24) forgot their login information, 8% (2/24) forgot to sign in and an additional 8% (2/24) reported they forgot about the portal entirely. Of the twenty-four, 17% (4/24) noted they were not interested in using the portal.

The remaining two participants recorded the following reasons for not accessing the portal: One had a prolonged hospital and rehab stay, and one was concerned about the safety of her information on the portal.

Table 3. Reasons for not signing into portal after 2 months

<table>
<thead>
<tr>
<th>Reason</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No clear reason to sign in</td>
<td>8 (33%)</td>
</tr>
<tr>
<td>Forgot login information</td>
<td>6 (25%)</td>
</tr>
<tr>
<td>Not interested in using the portal</td>
<td>4 (17%)</td>
</tr>
<tr>
<td>Forgot about the portal</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>Forgot to sign in to the portal</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>Concerned about safety of portal</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Away from home, prolonged hospitalization</td>
<td>1 (4%)</td>
</tr>
</tbody>
</table>

Discussion

Principle Findings
This quality improvement project demonstrated the benefits of providing one on one orientation to an established patient portal in an outpatient office setting. Initially, 60 participants enrolled, however at the 2- month assessment point two were excluded as one could not be reached by phone due to contact information change and the second had died. Of the 58 remaining participants, 85% (51/60) felt confident with the use of a computer and navigating the internet at 90% (54/60). Of the 34 participants who did sign into the portal, 85% (29/34) used the portal to review test results, 56% (20/34) used the portal to read messages from their healthcare provider. Twenty-seven percent of the participants (9/34) sent messages to the office while only 3% (1/34) used the portal to request an appointment.

Of those participants who did not access the portal, 79% (19/24) reported confidence using the computer and 83% (20/24) reported confidence in being able to navigate the internet. Only 8% (2/24) of the participants who did not access the portal reported anxiety related to using computers. Reasons given for not accessing the portal at the end of the two-month period included: 8/24 (33%) reported they had no clear reason to sign into the portal, while 25% (6/24) forgot their login information, 8% (2/24) forgot to sign in and an additional 8% (2/24) reported they forgot about the portal entirely. Of the twenty-four, 17% (4/24) noted they were not interested in using the portal. The two remaining participants recorded the following reasons for not accessing the portal: One had a prolonged hospital and rehab stay, and one was concerned about the safety of her information on the portal.

During the in-office orientation, participants often commented that the portal was much easier to navigate than they expected. Features the participants liked included the ability to access and print from the portal laboratory results for other provider appointments as well as ability to add results from other providers into their portal accounts. They found being able to communicate with the office without making a phone call and the ability to request medication refills online to be valuable assets.

Interestingly, although women were higher in enrollment numbers it was the men who signed into the portal more often at 53% vs. the women at 47%. Of the 4/60 (7%) participants that had previously been enrolled in the portal but had not used it for > 12 months: 2 (50%) signed in
within two-months after orientation., while the remaining 2 (50%) did not. The participants who signed in cited needing help navigating the site and forgetting login information. The two who had not signed in > 12 months prior to orientation and also had not signed in 2 months after orientation reported prior to orientation that there was no clear reason to sign in or there was no interest in the portal. Post orientation the same two reported having no interest in using the portal.

Prior to orientation 5/60 (8%) of participants responded that computers made them anxious. Of those 5 participants 3 signed into the portal at the two-month review while 2 did not. This supports the theory that an organized and thorough orientation along with 24-hour a day phone support and written materials can increase patients’ confidence when using a patient portal. Those who did not sign in cited multiple reasons with the 33% (8/24) citing no clear reason to sign in and 25% (6/24) forgetting sign in information.

In general, there was a modest increase in the usage of portal after an orientation was provided. Prior to intervention 13% of the office population had signed up for the patient portal. Of those enrolled an estimated 50%, actually used the portal. After the orientation program there was a 57% usage rate of the participants in the project.

Limitations

The project’s limitations include the practice location. It is a rural seaside community with a high concentration of Caucasian patients. A similar project in an urban setting would likely find a more diverse enrollment and possibly different outcomes.

Another consideration is that the office where the participants were recruited is a specialty office where participants may only be seen once or twice a year. In that case they may only feel the need to enter the portal just before or after their visit. A study by Krist et al. [10] focused on the EHR use in primary care offices and was conducted in eight offices over a 31-month period. They noted that if the participants had comorbidities they used the portal more often. They felt this was most likely because they required more detailed and frequent care and the portal helped
them manage that care. Given their findings it could be anticipated that over a longer period of
time more participants in this project would sign in and find the portal useful.

The sample size was small and obtained by convenience. To undertake a large-scale enrollment,
a dedicated staff member being assigned to the task could capture many more participants.

Future Implications

Use of the portal provides participants easy communication with the staff that can
decrease response time and provides written information that can be reviewed if forgotten.
Having a practice-wide program for education of patients and family on a routine basis will
likely increase enrollment and interaction with the portal. The office manager committing a set
amount of staff hours towards patient enrollment will ensure the progress towards increased
patient portal use continues.

Future quality improvement projects regarding patient portal use could include differences
between urban and rural practice settings enrollment. What degree of improvement in
measurable outcomes such as medication compliance, goal vital sign achievement, patient
satisfaction levels, and patient appointment cancelations can be measured.

Conclusions

A concise and thorough in-office patient orientation to an established patient portal can result in
increased patient interest, use of portal, and engagement in their care.

Acknowledgements

The authors would like to thank committee members Bethanne Wolfson, MSN, FNP-BC and
Denise Engle, office manager as well as the staff of the outpatient office who assisted with
patient recruitment.

References


**Abbreviations**

**BMI:** Body Mass Index
**BP:** Blood pressure

**CMS:** Centers for Medicare and Medicaid Services

**EHR:** Electronic Health Records

**EP:** Eligible Provider

**CEHRT:** Certified EHR Technology

**LDL:** Low-density lipoprotein cholesterol

**PAM:** Patient Activation Measure