Patient Portal Usage: A Study of Antecedents and Patient Outcomes

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Background

- Patient portals are web-based services or mobile applications that patients can log and view
  - Personal health information
  - Schedule appointments
  - Order prescriptions refills
  - Pay medical bills
  - Exchange secure communication with their healthcare providers
Benefits and Usage of Portals

- Healthcare providers who use patient portals can
  - Improve efficiency by expediting communication with patients and billing for services
  - Improve effectiveness of care
- Presumably, patients who are engaged in their health care and are better educated could positively impact their health outcomes
- Such a win-win technology would be expected to have high rates of adoption and usage
- However, several studies have found between 30%-50% of patients access and use portals
Current Understanding

- Many studies on patient portals use technology acceptance models (TAM) to understand the factors which influence intention to adopt portals.
- Few studies which have investigated real portal usage are descriptive.
- Some results from these descriptive studies are:
  - Portal usage is influenced by age and gender.
  - Portal usage is influenced by behavioral intention and habit.
  - Portal usage is not moderated by race.
- No study yet that looks at the data on portal access and usage stored on the portal systems themselves.
Research Questions

• Combining the objective data from portal web logs with surveying the patients about their motivations and perceptions will help us
  – Understand the real drivers of patient portal usage
  – Determine the impact of usage on patient satisfaction and health outcomes
Theoretical Model

- Social Influence (SI)
- Habit (H)
- Facilitating Conditions (FC)
- Ease of Use (EU)
- Performance Expectancy (PE)
- Perceived Vulnerability (PV)
- Perceived Severity (PS)
- Usage (U)
- Satisfaction with Portal (SWP)
- Perceived Health Outcomes (PHO)
- Health Seeking Behavior (HSB)
# Phase 1 Data Collection Elements

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Biometric Data</th>
<th>Usage Data</th>
<th>Health Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Primary Diagnosis</td>
<td>Frequency of Use</td>
<td>ICD-10 Codes</td>
</tr>
<tr>
<td>Sex</td>
<td>Height</td>
<td>Portal Features Accessed</td>
<td>Acuity Scores</td>
</tr>
<tr>
<td>Race</td>
<td>Weight</td>
<td>Extent of Use</td>
<td>Healthy Days</td>
</tr>
<tr>
<td>Educational Level</td>
<td>Body Mass Index</td>
<td>Episodic Duration of Use</td>
<td>Readmissions</td>
</tr>
<tr>
<td>Zip Code</td>
<td>HDL</td>
<td>Activation Date</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>LDL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Status</td>
<td>Total Cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Physician ID</td>
<td>Glucose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending Physician ID</td>
<td>Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility/Practice ID</td>
<td></td>
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</tr>
</tbody>
</table>
Phase 1 Data Collection Elements (continued)

<table>
<thead>
<tr>
<th>Health Behaviors</th>
<th>Intent to Change</th>
<th>Self-Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking Status</strong></td>
<td>Smoking</td>
<td>Physical Health</td>
</tr>
<tr>
<td><strong>Alcohol Consumption</strong></td>
<td>Exercise</td>
<td>Mental Health</td>
</tr>
<tr>
<td><strong>Sleeping Habits</strong></td>
<td>Stress Level</td>
<td>Work Absences</td>
</tr>
<tr>
<td><strong>Seatbelt Use</strong></td>
<td>Diet</td>
<td>Family History</td>
</tr>
<tr>
<td><strong>Fire Prevention</strong></td>
<td>Weight</td>
<td>Patient-reported Outcome Score(s)</td>
</tr>
<tr>
<td><strong>Dietary Habits</strong></td>
<td>Compliance With Medical Advice</td>
<td></td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td>Sleeping Habits</td>
<td></td>
</tr>
</tbody>
</table>


## Phase 2 Data Collection: Survey Questions

<table>
<thead>
<tr>
<th>Construct from Theoretical Model</th>
<th>Abbreviation</th>
<th>Survey Item</th>
</tr>
</thead>
</table>
| Social Influence                                 | SI           | • People that care for me want me to use the portal  
• People that influence me want me to use the portal  
• My nurse or physician has encouraged me to use the portal |
| Habit                                            | H            | • Portal usage has become a habit for me  
• I must use the portal on a regular basis to improve my health |
| Facilitating Conditions                          | FC           | • I have access to a device that connects to the Internet  
• I know how to access the portal  
• The portal works with other technology that I use |
| Ease of Use                                      | EU           | • Learning to use the patient portal was easy for me  
• The portal is easy to navigate and use |
| Performance Expectancy                           | PE           | • Using the portal will support the care I receive  
• Using the portal allows me to be more involved in my own care |
## Survey Questions (continued)

<table>
<thead>
<tr>
<th>Construct from Theoretical Model</th>
<th>Abbreviation</th>
<th>Survey Item</th>
</tr>
</thead>
</table>
| Perceived Vulnerability          | PV           | • I believe I am vulnerable to illnesses  
                                 |              | • I believe that I am not likely to suffer from most illnesses that other people get |
| Perceived Severity               | PS           | • I believe that my current health conditions are serious |
| Satisfaction with Portal         | SWP          | • I am satisfied with the patient portal  
                                 |              | • I would recommend using the portal to my friends and family |
| Health Seeking Behavior          | HSB          | • Portal usage has influenced me to exercise more  
                                 |              | • Portal usage has influenced me to adopt healthier behaviors |
| Perceived Health Outcomes        | PHO          | • Portal usage has contributed to me being in better health |
Research Partnerships

• Ongoing effort
• Currently
  – Actively collaborating with major university health center
  – Advanced stage of discussions with a regional health provider
  – Advanced stage of discussions with a cancer hospital

• Seeking additional partnerships!!
Benefits of Participating in this Study

- Better understanding of how patients use portals
- Educate patients on benefits of portal usage
- Better portal design

- Leading to:
  - Increased and more effective usage
  - More efficient usage
  - Increased active patient engagement
  - Increased patient satisfaction
  - Improved health outcomes