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Health Portal Functionality and the Use of Patient-Centered Technology

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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2016

Abstract

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MSN, Harding University, 2004

BSN, Harding University, 1987

Project Submitted in Partial Fulfillment

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Doctor of Nursing Practice

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Abstract

Health portals are dedicated web pages for medical practices to provide patients access to their electronic health records. The problem identified in this quality improvement project was that the health portal in the urgent care setting had not been available to staff nor patients. To provide leadership with information related to opening the portal, the first purpose of the project was to assess staff and patients' perceived use, ease of use, attitude toward using, and intention to use the portal. The second purpose was to evaluate the portal education materials for the top 5 urgent care diagnoses: diabetes, hypertension, asthma, otitis media, and bronchitis for understandability and actionability using the Patient Education Material Assessment Tool, Simple Measures of Goobledygook, and the Up to Date application. The first purpose was framed within the technology acceptance model which used a 26-item Likert scale ranging from -3 *(total disagreement)* to *+3 (total agreement)*. The staff (n = 8) and patients (n = 75) perceived the portal as useful (62%; 60%), easy to use (72%; 70%), expressed a positive attitude toward using (71%; 73%), and would use the technology (54%; 70%). All materials were deemed understandable (74%-95%) with 70% being the acceptable percentage. Diabetes, otitis media, and bronchitis were deemed actionable (71-100%), but hypertension (57%) and asthma (40%) had lower actionability percentages. Hypertension, asthma, and otitis media had appropriate reading levels (6-8th grade). However, diabetes (10th grade) and bronchitis (12th grade) were higher with the target being less than 8th grade level. All handouts were found to be evidence-based. Recommendations were to revise the diabetes and bronchitis educational handouts to improve readability. Social change can be promoted by this project by facilitating positive patient outcomes at urgent care clinics.

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Dedication

I would like to dedicate this project to my mother and father. They always wanted me to continue to pursue my dreams. Thanks for pushing me to do so.

Secondly, I would like to dedicate this to all my coworkers who work with electronic health records every day. Proud that we were the first ones to promote their use and have seen them significantly impact our nursing practice and improve our patient's quality of life.

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I would like to thank Dr. Joan Moon for her patience, direction, and encouragement throughout the DNP process. Her support and recommendations were paramount to the final project. I can never repay her for spending quality time at all hours of the day and night and for her encouragement. I would also like to thank one of my committee members Dr. Hayden for her multiple reviews of my project paper and for helping me clearly focus on the topic. In addition, I would like to include Dr. Schweickert and Jenny Martel for guidance on this fruitful journey.

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Section 1: Overview of Evidence-Based Project

Introduction

The American Association of Colleges of Nurses (AACN; 2006) defined the Doctorate of Nursing Practice (DNP) project as any evidence based project which has an impact on a healthcare outcome, including indirect administrative issues such as informatics and the health of the urgent care population. The project included some of the Essentials of Doctoral Education for Advanced Practice to determine competency in the DNP role (AACN, 2006). The quality improvement DNP project addressed the second essential competency which focused on evaluating the organizational system's electronic health portal needs while incorporating the best evidenced-based practice (AACN, 2006). Essential IV was also included and focused on the advanced practice nurse's role in facilitating informatics in clinical practice (AACN, 2006). Informatics is a vital link in the future of healthcare and quality projects (TIGER, 2011). One of the primary goals of the Healthy People 2020 Campaign focuses on improving health quality, equity, and outcomes (U.S. Department of Health and Human Services, 2014b). The scholar leader made a significant change to healthcare practice by evaluating the health portal functionality usage for the urgent care clinic's staff and patients.

Electronic health records (EHR) and health portals are dedicated web pages for medical practices to provide patients access to their medical records, ability to communicate with providers, and to obtain education (U.S. Government, 2014a). Improving quality of care through health portals is a vision of the Office of the National Coordinator (U.S. Department of Health and Human Services, 2011) and the Center for Medicare and Medicaid Services (U.S. Government, 2014b). Analysis of a report by the ONC found that EHR were so important that the Center for Medicare and Medicaid Services has committed federal resources to support the

use of them and have developed incentive programs to monetarily reward those providers who adopt, upgrade, implement, or demonstrate a meaningful usage of certified EHR (U.S. Government, 2015c).

Meaningful use is divided into three stages with requirements that increase with each stage. In order for the providers to receive the incentive payment, providers must demonstrate that they are meaningfully using the electronic health records by meeting objectives every year. Meaningful use 1 is focused on electronic data capture and sharing (U.S. Government, 2015). Meaningful Use 2 concentrates on advancing the clinical electronic record processes which include 14 core objectives and 10 eligible professional menu objectives. The menu objectives include the use of a health portal which provides patient-specific resources and data tracking capabilities via an electronic medical record (EMR). Stage 3 works toward improving outcomes of those who use the EHR (CMS, 2010).

This project focused on one urgent care clinic in Arkansas. The clinic was part of a group of urgent care clinics which provide affordable, high-quality, and walk-in medical care to underserved rural, mid-size cities, and suburban areas across the Southeast (Urgent Care Clinic, 2014). The clinic was open on weekends and nights and requires no appointment to receive care. The urgent care clinics are an alternative to traditional emergency room visits and much more affordable. The clinics treat patients with broken bones, acute minor illnesses, and minor lacerations; 30% of their population present with chronic conditions (E. Miller, personal communication, January 20, 2016). The franchise has 21 locations throughout Arkansas, Mississippi, and Tennessee.

The health portal in the system includes an unopened link to the patient's EHR allowing the patient to communicate with staff and have access to health resources. The gap identified at

the chosen urgent care clinic was a problem of no access to the health portal link for staff or patients to utilize. The staff expressed concerns about understanding the value of the system and being able to have the time to orient patients to the health portal (L. Scarbrough, personal communication, January 22, 2016). The clinic sees 25,000 patients per year and approximately 70 per day. Of these patients management has estimated that around 50% have chronic illnesses and use the center for their primary care provider. These patients could benefit from the health portal access (L. Scarbrough, personal communication, January 22, 2016).

Khanna et al. (2013) identified health portals as a benefit to informed decision-making and the preferred method of educational information. Das, Faxvaag, and Svanæs (2015) noted that the health portal was a source of information for their patients and a place to facilitate continued care. By having access to communication, data logging, and education provided in the portal, patients are more likely to be actively involved in their care (Gany et al., 2011). Horvath et al. (2011) noted that use of the health portal reminders significantly reduced the numbers of patients who did not come in for appointments. Jones, Weiner, Shah, and Stewart (2015) identified many patients used the health portal for tracking their health data, sending messages, and preparing for an office visit. Jhamb et al. (2015) identified the health portal to be used for medical history, appointments, medications, health data, and for advice from their provider.

Patients' use of the health portal can promote social change by involving patients in their health and well-being by having ready access on their electronic devices which can promote self-care management and involvement with their medical care such as in monitoring blood pressure, glucose screens, and prevention of exacerbation of asthma. The importance of evidence-based information in patient education is also supported in the literature (Al-Zahrani et al., 2015; Ghobrial, et al., 2014, 2013; Lau, et al., 2014; Mold & Lusignan, 2015; Piette, et al., 2015).

Health educational material readability is an issue to consider for the clinic population (Kruse, Bolton, & Freriks, 2015; Sharma, Tridimas, & Fitzsimmons, 2014). Therefore, assuring the education in the health portal link would be an important aspect of the project. While health portal usage is accepted and increasing, more attention was needed to understand why there was limited clinic access, staff use, and limited access by vulnerable patient populations.

Background

Health information technology (HIT) is a broad concept that includes an extensive amount of health data that is stored, shared, and analyzed (U.S. Government, 2013). Health information technology includes several platforms within the electronic health records which include the use of a health portal (Abramson et al., 2014). The technology has the potential to encourage the patients to be proactive (Ball et al., 2011). Patients can access information from their health record via any electronic device at any time needed. The information and education provided can help contribute to the management of their conditions (Wald & Sapiro, 2013). For instance, by using a trending tool to record blood pressure or glucose levels the tool can be linked to the main platform and trended for the healthcare provider to review. The provider and patient will receive warning messages for out of range results via email, text, or laptop computer alert. By using the system clinics can enhance communication, empower patients, give supportive care between visits, and improve patient outcomes (HealthIT, 2015).

The health portal gives patients information and education which can help to alleviate their health worries before coming to the doctor (Gany et al., 2011). The patients can take time to review their health data and assimilate some questions regarding their health prior to going to their clinic visit. If a health portal is not available the patients may search the internet for answers to their health questions; however, the educational material found may be erroneous and the

patients might struggle with the literacy level. All of these factors can mislead patients to not care for themselves properly (Edwards et al., 2014). By providing a secure evidence based site for the urgent care clinic's patients they can benefit from the best possible information contained on one web site that can be trusted as reliable, valid, culturally adapted, and with appropriate readability (Edmunds, Denniston, Boelaert, Franklyn, & Durrani, 2014).

Problem Statement

The problem which was identified in this QI DNP project was that although the EMR has been in the facility for the past six years, the health portal was never available to staff and patients. The decision to do so would come from upper management at the system level. Providing the system administrators with information obtained from a needs assessment on the perceived usefulness, ease of use, and intention to use the health portal might help them in their decision-making of when to open the portal. The literature shows that the lack of access to the health portal could lead to poor outcomes such as non-compliance with medical advice and unwarranted disease progression (Hussain, Naqvi, Ahmed, & Ali, 2015; Koonce, Giuse, Beauregard, & Giuse, 2007; Maez, Erickson, & Naumuk, 2014; Pinnock, & Thomas, 2015).

Some urgent care patients (45%) who need a follow up visit do not go back to their primary doctor for re-evaluation (Hospital Case Management, 2015; Robeznieks, 2015). By utilizing the health portal, these patients will have a communication link and a resource for information regarding their health care, particularly to remind them to return for follow up care. The clinic patients need information and education regarding the consequentiality of their conditions which the health portal can provide to facilitate the best possible health outcomes (van Os-Medendorp et al., 2012). Likewise, submission of a review of the education within the health

portal was done to determine if the content would be supported by the evidence in the literature and met literacy guidelines.

Purpose

The purpose of this QI DNP project was to assess staff and patients' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology. The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education. The tools used for this assessment were the adapted technology acceptance questionnaires based off of the technology acceptance model (TAM; Davis, 1989; Appendix A). Results of the needs assessment tools and the education evaluation will be presented to system administrators to provide information to help inform them of the need to move forward with implementation of the patient portal into the clinic practice post-graduation. The evidence-based literature shows that patients benefit from having access to the health portal (Aberger, Migliozzi, Follick, Malick, & Ahern, 2014; Fiks et al., 2015; Gany et al., 2011). There was a gap between what is shown to be effective in the literature and what was provided in the clinic setting.

DNP Project Questions

What were the attitudes of staff and patients toward using the health portal?

Did staff and patients perceive the portal as useful and easy to use?

Did the review of the five top clinic diagnoses educational handouts in the health portal show support by the evidence of appropriateness for the population?

Goal

The QI DNP project goal was to provide leadership with information to help determine whether or not to open the health portal for staff and patients. The project assessed the perceived usefulness, perceived ease of use, intention to use electronics, and the attitude of the new user towards the technology for the staff and patients and to overcome the barriers of use. The educational component was also be assessed to ensure the information was something the patients could read, understand, and use to promote positive health behaviors.

Outcomes

By the completion of the project the following outcomes were achieved:

- Analysis and synthesis of evidenced-based literature for leadership (Appendix M)
- The revised TAM questionnaire was administered to staff (Appendix B)
- The revised TAM questionnaire was administered to patients (Appendix C)
- The educational patient education information for the top five chronic diseases of patients in the clinic was analyzed with the Patient Education Materials Assessment Tool, SMOG method, and Up to Date (Appendix N)
- An executive summary was prepared for system administrators with the results of both activities (Appendix Q)

Framework

The framework used for this QI DNP project was the technology acceptance model (TAM; Davis, 1989). The TAM is based on the intention to use new technology and was created to predict and explain the acceptance of technology and user communication. The instrument being used was an adapted version of the Technology Acceptance Questionnaire. One questionnaire focused on the staff's use of technology and attitudes towards it. The patient

questionnaire asked questions which helped determine whether they would use technology and how they felt about using technology to better their care. The original questionnaire was public domain therefore no permission was needed to utilize it for this QI DNP project. In order for technology use to be measured the questionnaire included many facets to determine if the health portal would actually be utilized by the staff and the patients. The questionnaires included the following dimensions: perceived usefulness, perceived ease of use, intention to use electronics, and the attitude of the new user towards the technology (Davis, 1989). I used mixed statements to prevent bias and some questions were similar in topic on purpose. The model which was used for the QI DNP project achieved validity and reliability through two studies by Davis (1989). Davis researched 152 users and four program applications. The lists of measures were then made into Likert scales. The reliability was 0.98 for usefulness and 0.94 for ease of use. These Likert scales were highly convergent, factorial, and discriminant with regard to validity and reliability (Davis, 1989).

Nature of the Project

The approach to the gap between the literature which promotes the use of the health portal and the lack of access to the health portal in the clinic was the focus of the quality improvement DNP project. First, an extensive literature review was conducted followed by a needs assessment of both staff and patients using the TAM questionnaire to identify how they perceive technology and their willingness to accept and use the health portal (Davis, 1989). The educational assessment included the use of the Patient Education Materials Assessment Tool (PEMAT-P) to evaluate and compare the actionability and understandability of the top five chronic diseases treated at the clinic and patient education materials (Agency for Healthcare Research and Quality, 2013).

My role was project manager, and I worked with the clinic director to plan and administer the TAM questionnaire to the staff and patients (Appendix B & C). The TAM included the following dimensions: perceived usefulness, perceived ease of use, intention to use electronics, and the attitude of the new user towards the technology (Davis, 1989).

The project included an evidence-based review of and literary evaluation of five of the most frequently seen chronic conditions for which care was sought to help determine if the health portal educational material is evidence-based using the PMAT-P (AHRQ, 2013; Appendix D). By examining the literature and performing a needs assessment I identified the evidence to support the health portal's use and how the link could bridge the gap in the lack of access by the staff and patients.

After the Walden University Institutional Review Board approval the needs assessment questionnaires were presented at the clinic to collect data. At a staff meeting all were invited to complete the questionnaire. The TAM was administered to consenting staff at the urgent care clinic. Next the patient form of the tool was administered to a convenience sample of 75 consenting patients in the clinic setting when they came to the clinic for care. The consent and questionnaire form was handed out by the admissions clerk at the admission clerk's front desk. Finally, an executive summary of the results of the TAM assessments and the PMAT-P were written up and presented to administration then described in Section 5.

Definitions of Terms

Following are the definitions which were used to define the project:

Doctor of Nursing Practice Scholar (DNP scholar): The DNP scholar role is defined as a practice focused degree which facilitates evidence into practice (AACN, 2006). Projects

described by the DNP scholar are written up to include the questionnaires, assessment data, and an executive summary of the results.

Evidenced-Based practice: Evidenced-based practice involves the ability to analyze and apply research to promote the best clinical decisions in nursing practice (Terry, 2015). Evidence-based summarization is paramount for all healthcare providers to ensure patients have the most appropriate care available.

Health information technology: A wide variety of methods to share, store, and analyze health data (U.S. Government, 2013a). Technology can be used for more than storage of health data; the system can be used to provide a means to communicate with health care providers and provide a link to literacy appropriate and factual educational materials and information (U.S. Government, 2013a).

Health portal: One feature identified in EHR is called a health portal (Docutap, 2015). The health portal is a link to the patient electronic health record and allows the patients to engage in their health care and to print off their current health information. The system also provides a method to contact their health care provider and schedule appointments or request a refill. The key benefit of the link is the educational tab that allows learners of all types and levels to have access to appropriate medical information.

Meaningful use: When Medicare and Medicaid EHR incentive programs provide financial incentives for the meaningful use of certified EHR technology to improve patient care (Health IT, 2015)

Patient-centered care: According to the Institute of Medicine (U.S. Department of Health and Human Services, 2014) patient-centered care is health care that establishes a relationship between the providers and patients that includes respect for the patient's wishes, education, and

involvement in their healthcare. Healthcare providers who implement patient-centered care for their patients work to improve the patient outcomes by improving the quality of their relationship and decrease their prescription use, diagnostic tests, hospitalizations, and referrals to other specialties (Rickert, 2012).

Patient Education Materials Assessment Tool (PEMAT-P): The Patient Education Materials Assessment Tool is an evidence-based systematic tool used to compare and evaluate the actionability and understandability of patient education materials (AHRQ, 2013). Education material is actionable when the patients of diverse backgrounds and differing literacy levels can choose how they manage their health based off of the education given to them. Understandability is where those same patients can process the education given to them and select key concepts. The PMAT measures 17 items for understanding and seven for actionability. The target goal of the understandability percentages for this project was 70% (Health Mirror, 2016). Some educational materials evaluated may have lower actionability percentages due to the higher amount of words defining the topic instead of actions to perform so the scores will vary (Health Mirror, 2016; Shoemaker, Wolf, & Brach, 2014). The educational materials which score higher on the tool can be posted in electronic health records or on health portals for patient use.

Technology Acceptance Model: As developed by Davis (1989) and based on a person's intention to use technology, explain and predict the acceptance of information, and the acceptance of communication technologies by users. This model is valid and reliable (Holden & Karsh, 2010; Or, et al., 2011). The model encompasses the following dimensions: perceived usefulness, perceived ease of use, intention to use, and the attitude of the user towards the new technology. In the questionnaires, there are mixed statements and some of the question content were similar on purpose to prevent bias answers.

Urgent care clinic: An urgent care clinic is where immediate medical care is provided in the outpatient setting for the treatment of acute and chronic illnesses or injury (American Academy of Urgent Care Medicine, 2015). The care may be complex in nature or unusual which necessitates close communication between specialists. The type of care is not intended to replace a primary care physician. The clinic hours are typically longer in the day and on weekends to cover urgent needs.

Assumptions

Statements that are assumed and accepted as true, but have yet to be scientifically proven are considered to be assumptions (Terry, 2015). The project included the following assumptions:

- The health portal would be something that all staff and patients would want to access.
- The majority of the urgent care clinic's patients would have access to the technology to access the health portal.
- The staff was willing to work within the health portal and learn about the system to improve patient-centered care.

Limitations

Weaknesses in the theory and method of a study that may skew the findings are considered limitations (Grove, Burns, & Gray, 2013). The project had several limitations that may have alter the results:

- The implementation and evaluation of the project may not be generalizable to other clinic settings.
- The health care team may not be honest about facilitation of the health portal use.
- The patients may not wish to be involved in their care by using technology such as the health portal.

Significance of the Project

According to the ANA (2013), the use of electronic health records needs to be promoted for both providers and patients to increase use and access. Access to the health portal could lead to better outcomes for the patient and help promote compliance with medical advice and unwarranted disease progression (Hussain et al., 2015; Koonce et al., 2007; Maez et al., 2014; Pinnock & Thomas, 2015). Quality Improvement (QI) projects such as the implementation of a health portal are significant to the urgent care clinic's quality of patient care. The provider benefits from the patient's involvement in their health and educational needs. By utilizing electronic health education the patient can benefit by being better informed about health and can potentially increase self-management of the disease. Health portals can also benefit those who have literacy and cultural barriers by providing a link to quality low literacy and translated health educational materials to promote optimum care. The health portal would benefit the staff with patient communication and educational information for the urgent care clinic patients. The practice problem was the gap in access to the health portal's features. The purpose of the proposed project was to gather data to support the health portal usage by administering two questionnaires related to staff and patients attitude towards the use of a health portal.

Electronic health records are beneficial to clinics that use them in healthcare by making the charting practice streamlined. By utilizing the health portal the patients can benefit by being better informed about their health and can potentially increase self-management of their diseases. Health portals can also benefit those who have literacy and cultural barriers to optimum care. The health portal would potentially benefit the staff with communication and the health outcomes of the urgent care clinic patients.

Summary

The problem which was identified in this QI DNP project was that although the EMR has been in the facility for the past six years, the health portal was never available to staff and patients. By using the TAM questionnaires, a needs assessment was conducted of the staff and patients. As well, evaluation of the educational component for the top five diagnoses related to incorporation of evidence-based practice and literacy was conducted. The gap was shown between the evidence in the literature related to the effective use of health portals and the lack of access in the urgent care clinic. The QI DNP project sought to fill that gap. The health portal application would support patient-centered care by allowing the patient access and utilization of the health portal tab. The successful implementation and evaluation of the DNP project could significantly influence social change by allowing access to the health portal for the staff and the patients at the urgent care clinic to potentially promote a healthier lifestyle.

As a DNP scholar, incorporating the Essentials of Doctoral Education (AACN, 2006; American Nurses Association, 2014; Terry, 2015) includes the ability to collect data, analyze assessment problems and identify informatics outcomes, and apply the evidence into practice. The project meets the Walden DNP outcome of incorporation of the application of healthcare informatics (Walden University, 2015) and partially fulfills the role to facilitate significant social change in practice. Section 2 is a review of the literature for the project related to efficacy and benefits of the health portal in the clinical practice setting.

Section 2: Review of Scholarly Literature

Introduction

The problem identified in the QI DNP project was that although the EHR has been in the facility for the past six years, the health portal has never been made available to staff and patients. A gap existed between the evidence and patient services provided by the urgent care clinic. The purpose of this QI DNP project was to assess staff and patients' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology. The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education.

The evidence-based literature shows that patients benefit from having access to the health portal of the EHR (Aberger et al., 2014; Fiks et al., 2015; Gany et al., 2011; Lau et al., 2014). Aberger et al. (2014) identified the health portal as a tool to facilitate the optimization of blood pressure control in transplant patients. The study showed statistically significant reductions in the average blood pressures with the systolic being reduced 6.0 mm Hg and diastolic by 3.0 mm Hg over a 30 day period. Fiks et al. (2011) linked the use of the health portal with a lower frequency of asthma flares and many parents were satisfied with the health portal (92%). The parents reported better communication and a higher awareness of the chronic condition's importance. Gany et al. (2011) identified health portals to help with keeping the patient's cancer appointments and continuing care (86%). The health portal also helped give education to cancer patients which reduced worry about their care (72%). Lau et al. (2014) pointed out that a higher proportion of health portal users (56%) achieved a lowered A1C level. When clinics activate health portals and educate their patients about the health portal option the patients have the potential to be more engaged in their care (Turvey, et al., 2014).

The following section will cover the literature search strategy, literature review, and retrieval of evidence on the technology acceptance model, health portals, health portal education, self-centered care, leadership, technology, urgent care centers, and staff acceptance to support the problem.

Literature Search Strategy

The research on the use and benefit of health portals was difficult to find due to the newness of the systems in the health care area and limited use in practice settings to date (Goveia et al. 2013). A detailed literature search of the following databases through the Walden Library was completed: Medline, CINAHL, Sage, EBSCO, ProQuest, Ovid, and PUBMED; using articles within the five-year range, 57 articles were found that identified the benefit of using a health portal. The search engines included: Google, Google Scholar, and Yahoo. Keywords, authors, search criteria, and Boolean library strings helped to narrow down the findings by streamlining the information into key content areas regarding health portals. The keywords used in the search were: health portals, self-centered care, electronic health record, meaningful use, patient engagement, computer usage, computer literacy, technology acceptance, public policy, healthcare policy, health portal/meaningful use, and legislation. The search included peer-reviewed and foundational literature. The John Hopkins Grading Scale (Newhouse et al., 2005) was also utilized to evaluate the literature.

Literature Review

Technology Acceptance Model

The technology acceptance model (TAM; Davis, 1989) focuses on the end-users acceptance of the health portal for a health communication. Success of health communication through a health portal depends on the use of the technology by the target population and for the intended use of the technology. Davis's TAM provides a valid and reliable measurement tool that

predicts the acceptance and use of the technologies by end-users (Davis, 1989). Davis's (1989) original work with the TAM predicted acceptance based on the end-user's perceived usefulness and perceived ease of use of technology for a specific purpose. Davis (1989) applied the tool in work settings and identified perceived usefulness as how the staff thought the electronic system would make their job better. Davis also defined the perceived use of the technology as to how effortless the patient or staff thinks the system will be. The tool achieved validity and reliability through two studies completed by Davis. Davis (1989) researched 152 users and four program applications. The lists of measures were then made into two six-item Likert scales. The reliability was 0.98 for usefulness and 0.94 for ease of use. These Likert scales were highly convergent, factorial, and discriminant with regard to validity (Davis, 1989). Holden and Karsh (2010) performed a meta-analysis of 16 data sets from 20 studies of health care providers which used health information technology for patient care. The studies were varied in nature yet certain studies identified TAM relationships, such as usefulness and ease of use, which were statistically significant. The TAM predicted the use and acceptance of information technology.

Or et al. (2011) performed a cross-sectional secondary analysis evaluating the technology-assisted nursing care system with adults with chronic disease. The TAM questionnaire was completed by 101 patients to measure the usefulness of technology. They identified that the usefulness was perceived by 53.9% of the patients. The perceived usefulness, behavioral use, and health care knowledge were effectively predicted 68.5% of the time. This study identified the usefulness and ease of use to predict if the patients would accept and self-report their health issues through a health portal.

In summary, the TAM model is reliable and valid. The model identifies the relationship between the user and technology. Use of the model will help to identify user preferences and acceptability to health portal use.

Health Information Technology

Electronic health records have significantly increased over the years, particularly due to the government's meaningful use mandates (CMS EHR, 2010). As of 2015, 95% of all providers demonstrated pursuing meaningful use protocol (Hsiao & Hing, 2014; Hsiao et al., 2011; Office of the National Coordinator for Health Information Technology, 2016). By utilizing the electronic records there can be many benefits which will help patients. One of these benefits is to help aggregate individuals and populations to identify outbreaks and treatment modalities. Physicians collect the data and analyze the outbreaks and treatments to get information to work towards better methods for patient monitoring, best evidenced-based practice, comprehensive plans of care, and are monetarily rewarded for their quality of care (Bendix, 2014). However, even with the wave of technology, minimal research regarding the system usability and outcomes in practice has been available.

Meaningful use (CMS EHR, 2010) includes using the electronic record in the clinical setting. The first part of meaningful use includes using electronic records to collect data and promote the transfer of the data through communication between health care computer systems (Health IT, 2013). The second part includes the ability of the patients to view their health information by using the health portal for clinic practices (Health IT, 2013). The health portal's content will vary based on the program developer and the program that was purchased for use in the clinic setting. Another piece to look at for providers is the cost, connectivity, and the functionality of the health portal system. Mazzolini (2014) evaluated the vendor's inability to upgrade current systems to interface the needed health portal application and found the

physicians were not being able to afford the upgrade. The third stage of meaningful use includes increasing online patient engagement which will have to be driven by education of the public and their actual buy-in to the value of having access (CMS EHR, 2010).

Health Portal

Horvath et al. (2011) found the health portal also increased compliance with office visits due to the patients' active involvement on the health portal. They noted that out of 58,943 clinic patients who enrolled in the health portal, the clinic's no-show for follow-up clinic visits rate was down 2.0%. However, Horvath (2011) noted patients who chose not to participate with the health portal showed an increase in not keeping their scheduled appointment.

The use of the health portal allowed the patient and family to stay connected and increased the patient's quality of care by utilizing the health portal system. Roben et al. (2012) found the use of the health portal aided with elderly care. Roben (2012) noted that 55% of older persons and 84% of their professional caregivers used the health portal link to enhance their health care.

Most physicians who used the health portal are seeing better patient outcomes (78%), higher use of remote chart access (65%), and access to critical lab values (62%) according to King (2014). King (2014) noted that 30 to 50% of physicians who had used electronic records for longer than two years reported that the electronic record promoted recommended care, ordered the correct tests, and encouraged patient communication. Not only does the system help with patient education but the system helps providers to coordinate the patients' care in a more streamlined method.

Lau et al. (2014) noted that by providing access to diabetes education material, laboratory values, and communicating with their health care providers were beneficial to both patient and

provider to manage their care. Lau et al. (2014) also noted patients with diabetes had their A1C monitored more while using the communication, reporting, and education portion of the health portal system. The health portal users achieved A1C $\leq$ 7% at follow up (56% vs. 32%; p=0.031), which identified their glycemic control was improved with the education that the health portal provided.

Wagner et al. (2012) studied the impact of the health portal on hypertension by measuring biological data, self-care, perception of quality of care, and the use of the portal. Of 453 patients, patients who were actively using the health portal showed a 5.25 point reduction in diastolic blood pressure. The process improved the patients' clinical outcomes significantly. Gany et al. (2011) identified that 72% of patients had their worries about their care and treatment alleviated due to the information in the health portal.

Makai et al. (2014) studied a group of 290 elderly patients, aged 74-90, who tried to use a health portal application. The patients primarily used the system to make health goals for their future. Makai noted the patients used the portal for health goal setting (47.9%), and several (13.1%) of the patients evaluated them within a 2-year period. Thirty-three of these patients chose healthy interventions specific to their illness, such as nutritional guides, to help them reach their goals. The study identified the elder population to be actively involved in the health portal and can benefit from using the system.

In summary, health portals have been beneficial to improve many patients' health outcomes. The health portal has benefited the elderly and their caregivers by keeping them abreast of the patient's health status and helping them keep scheduled appointments. Along with these benefits the physical parameters, such as blood pressure and A1C, have been reduced due to patients and families using the benefits of health portal features.

Health Portal Education

Access to Use Education. One problem with the new "meaningful use" guidelines is the lack of provider education regarding how the systems work and what is needed to help make the EHR meaningful (E. Miller, Personal communication, Healthcare provider, December 11, 2015). Goveia (2014) noted no significant improvement in "meaningful use" in clinics due to limited education about the systems use and data entry. Goveia recommended the providers have tailored classroom training, actual computer training, and feedback about how the health portal functions both from the provider and patient perspective. For patients to be able to take full advantage of the access to their records and educational materials providers must consider community education programs that target how the health portal works and discuss any literacy issues the patients may have (Galbraith, 2014). Tannery (2011) found that providers could utilize the information in the health portal to help teach patients about health care choices and to facilitate informed consent decision making.

Once the patients are aware of how the health portal works the goal is for them to be more actively involved in their own care by using the available education and tracking logs. If the educational information is available studies identify that the health portal would be used (Khanna et al., 2013; Ossebaard, 2012). Khanna et al. (2013) noted out of 44,000 health portal visitors, the rate the patients searched for educational information was 27.6% going from one educational document to another, which identified a significant need for digital health information in health portals.

Patient Education. Patient education, when offered to patients in an easily understandable format, can make a positive impact on the patient's health status and long term management of diseases. Ossebaard (2012) identified health portal educational information was a significant benefit to patients and was used by over 4 million patients in 2010. Ossebaard noted

that 65% of those 4 million patients who used the hospital had long-term conditions and needed information about the disease, self-care interventions, and information regarding their decisions about their care.

Healthcare search engines sometimes do not directly link a patient to appropriate or accurate health educational materials. De Silva and Burstein (2014) noted many health care related search engines that the public had access to were not accurate and felt the most current health educational content should be available in the health portal. For example, when researching heart disease websites, researchers (Bastos, Paiva, & Azeydeo, 2014) identified several educational quality issues. They noted on examining 200 health information websites more were frequently commercial in nature (49.5%), not solely about stroke or heart disease (94.2%), and lacked medical facts (59.5%). The group identified the quality of the health information was within an acceptable range however was not trustworthy, which could impair the patient's decision making ability regarding their health. All types of health education, according to Khanna et al. (2013), must be appropriate, readable, and organized for the patients to make the best choices in their health care.

Health readability is also a significant issue with internet and health portal education. Ghobrial et al. (2014) noted when the top search engines were used to search for professional health educational websites the engines would usually take the patient to a reliable and easily readable source ($P = 0.078$). Several tools exist to help healthcare providers to evaluate the readability quality of the educational information. One of the readability tools scores the educational material on readability at a grade level, preferably at 8th grade level. The SMOG (McLaughlin, 1969) formula and the Flesch-Kincaid formula (Flesch, 1948) are two methods which can be used to grade educational materials. Sharma et al. (2014) reviewed several health

educational websites and used both the SMOG and Flesch-Kincaid. Sharma et al. (2014) noted out of 100 of the health educational webpages none met easy, low level readability. The mean Flesch-Kincaid, according to Sharma et al. (2014), was 10.4, SMOG grade level was 12.1, and over half of them were at graduate levels or above in readability. Conversely, Sharma et al. (2014) noted the non-profit sites were much lower level to read ($P = .0006$) and more appropriate for the average health consumer to understand. Using the tools helps to review the health portal educational offerings to determine if they are appropriate and usable in the clinic system. When Edmunds et al. (2014) looked at the readability of the top 20 patient education resource websites they discovered the readability scores for online education to be too complicated for most patients to understand. They noted the average Flesch Reading Ease Score was 46 with 100 being the easiest read, the Flesch-Kincaid Grade was at 11th grade reading level which was classified as "difficult". Screening of all online educational materials before patients use them to make medical decisions is important to quality care.

Fioretti et al. (2015) reviewed 3900 health education web pages and used the Flesch-Kincaid method to score the pages. Of the health education pages 30% were poor or very poor in quality and 47% of the pages were of moderate quality. Fioretti et al. (2015) identified that less than half of these patient education pages mentioned risks to watch for to prevent complications. The authors gave a warning to healthcare providers to teach their patients to only rely on education that the clinic provided them with and not to utilize websites for their health information.

Patients can also be misled when using website education for assistance for medication administration guidance. Edwards et al. (2014) reviewed online web pages for accurate information regarding medications; when the medications were searched unreliable websites

came up for review, such as Wikipedia. Edwards et al. (2014) corrected the medication information on 14 web pages through Wikipedia however found many web pages and sites that had inaccurate and poor information on them which could not be corrected.

Conversely, McKibbon et al. (2011) noted in a review, of 428 health portal medication articles the sites' educational information was a benefit for the patients. These educational articles improved the clinic's process of medication education by having a central location for patients to review the education at their convenience. These findings support the use of the health portal for medication information and guidance post clinic visit.

Patient-Centered Care

The use of a health portal encourages patient-centered care and can be a financial benefit to the patient and society (vanOs-Medendorp, 2012). Out of 199 atopic dermatitis patients enrolled in a health portal, the portal helped lessen employment absenteeism and reduced overall medical costs (> 73%) of their illness. Motivating patients to be active in their care can be challenging but should be something that health care providers strive to promote. Murray (2013) showed the patients' preference of taking their health history was through the use of the health portal (23.1%). The ability of the patients to open a health portal and look at their current health status allows them more control and can motivate them to participate in their care (Murray, 2013).

Preventative services can also be promoted using the health portal information site. Nagykaldi, Aspy, Chou, and Mold (2012) noted out of 538 patients 98% found the health portal easy to access, 80% felt they benefitted by participating in their health care, and 83% thought the health portal was a valuable resource for preventative care. Nagykaldi et al. (2012) identified 84% of their patients clicked on all the recommended preventative services offered; 78.6 % took

aspirin, and 82% chose to take Pneumovax. Nagykaldi et al. (2012) identified 95% of children whose parents interacted with the health portal received all of the recommended immunizations. They found young adults who used the health portal regularly showed an increase in their health engagement. The findings from these studies indicate the health portal is beneficial in promoting preventative care post clinic visit both for adults and children.

Self-care for chronic diseases is extremely important to prevent long-term complications. Some patients prefer to use urgent care clinics for their long-term illness instead of primary care due to ease of entry into the clinic to be seen (E. Miller, personal communication, January 20, 2016). The health portal option at the urgent care clinic can be used to manage chronic conditions. Van Os-Medendorp et al. (2012) studied a group of chronic illness patients who were enrolled in a health portal by their provider which encouraged active participation in their care. The patients in the health portal group noted the patients relied on their urgent care providers for their treatment interventions. Due to the education they had access to in the clinic's health portal about the chronic disease process they chose to be more actively involved in their care.

Another issue of importance is addressing the best method of educational presentation for patients through the health portal. Alzaman et al. (2013) surveyed patients at a clinic about the educational instruction they received. The patients remembered the health portal education about managing their disease, complications, and the modifiable risk factors which the patient can control. Alazman et al. (2012) noted the clinic patients' ability to apply the health recommendations had a positive effect on their A1c levels (8.0), blood pressure level (140 mm Hg), cholesterol level, medication adherence, weight loss, smoking cessation, and an increase in physical exercise. Alzaman et al. (2012) found that the verbal education helped the clinic patients

with positive outcomes, however, the researchers suggested that more education was needed to keep the patients motivated for the long term after the clinic visit.

By using the health portal information and data storage to promote self-centered care, significant benefits can be seen for those long-term chronic conditions. So and Lin (2015) reviewed the best practice for hypertension management and self-care. The researchers completed a retrospective study of 1011 adult patients' charts and noted whether they had received health portal education and a long term treatment plan documented in the health portal. Of those patients studied, 44% had hypertension education and a long term treatment plan, 30% had hypertension education but no long term treatment plan, and 26% had neither hypertension education nor a long term treatment plan listed. With 44% of the patients getting health portal education and long term treatment plan their care is better managed than those without.

Another purpose of the health portal is to help with action plans for asthma patients. Al-Zahrani et al. (2015) looked at the behaviors of asthma patients to explore why they had uncontrolled asthma attacks so often. The researchers noted out of 400 patients, 54% used their inhaler inappropriately and 39.8% of these patients had increased clinic visits due to the uncontrolled asthma attacks. Al-Zahrani et al. (2015) identified that these patients could benefit from using the health portal to keep them on track with an asthma action plan which could potentially increase asthma control. By opening up a health portal, these plans can be easily accessed and available to promote self-care and management of their illness long-term.

In summary, the health portal is an effective tool to help promote positive outcomes for patients. Health portals are a means of communication with the healthcare provider and a way to keep a log of the patient's health data for provider review. The health portal opens up valid and

reliable educational materials for patients to utilize and is available to the patients at any time they need to review them.

Leadership and Technology

According to AACN (2015), there are around 3000 nurses who specialize in informatics of which 30% of these are leaders in their healthcare facilities. The goal of informatics is to improve communication between providers and patients while pursuing a high quality of care (Herrin & Cabibbo, 2013). The business side of medicine focuses more towards strategies and how reimbursements are made. These two disciplines, informatics and business, must mesh to reform the delivery of care systems and obtain the monetary incentives needed to have a profitable business. The business side of informatics is paramount in pushing towards smarter and more efficient EHR. The DNP scholar's role is to promote advanced practice nursing by facilitating the activation of the health portal which is supported by the literature to promote quality outcomes (Aberger et al., 2014; Fiks et al., 2015; Gany et al., 2011; Herrin & Cabibbo, 2013).

A vision of the Office of the National Coordinator (U.S. Department of Health and Human Services, 2011) and the Center for Medicare and Medicaid Services (U. S. Government, 2014b) is to promote quality by utilizing informatics in practice. A report by the ONC identified that using technology was so important that Center for Medicare and Medicaid Services (CMMS) sanctioned federal resources to support the use of technology (U.S. Government, 2014b). The ONC and CMMS developed incentive programs to monetarily reward those providers who adopt, upgrade, implement, or demonstrate a meaningful usage of technology in practice (U.S. Government, 2015c). Meaningful use includes three stages with requirements that

increase. Leadership must demonstrate that they are meaningfully using the electronic health records by meeting the ONC's objectives.

Urgent Care Clinics

Opening up the health portal can aid with giving patients an informational resource to use to determine what is urgent versus an emergent need or something that needs to be seen at a primary clinic for evaluation. Americans tend to navigate towards the traditional emergency room for care instead of the urgent care clinics or primary care clinics (Durand et al., 2012). Urgent care clinics are for patients who need urgent and immediate care but are not sick enough to go to the emergency room. Primary care is for those who have chronic conditions or acute needs however do not urgently need to be seen. Many urgent care clinics have arisen to fill the need of those patients who cannot get into the emergency room or who need urgent and immediate care.

Weinick, Burns, and Mehrotra (2010) identified one-fourth (13.7% -27.1%) of the patients who enter the emergency department do not have critical needs and cost the system a significant amount ($4.4 billion) of money every year. Ailments such as fractures, sprains, and acute illnesses can be treated at urgent care clinics. Patients are unaware or do not understand when to use the emergency room, urgent care clinic, or primary care clinic. Through providing access to a health portal, Yoffe et al. (2011) instituted an educational program to reduce inappropriate visits and reduced the number of overall emergency room visits. The medical residents in the emergency department handed out a 6.7 grade reading level book to all parents with children. Yoffe et al. (2011) tracked the same patient visits between 2008 and 2009 and noted a reduction of emergency room visits from 81% down to 55% compared to the previous year ($P \leq .001$).

Most of the electronic computer charting programs developed for urgent care clinics allow the providers to add evidenced-based templates and screening tools to use for patient documentation. Screening tools incorporated into the EHR regarding human immunodeficiency virus (HIV) testing were implemented in an emergency room setting. Bender et al. (2014) tracked the usage of the HIV screening template and found a 36% increase in HIV screening. Urgent care clinics not only can screen for potentially missed illnesses but also provide a quick turnaround in care. According to Paschal (2012), by using urgent care clinics for their care, patients quickly get reassessed and treated, usually in 45 minutes once their test results return.

In summary, urgent care clinics provide a much needed service to the community by providing urgent care quickly. The clinics typically use the best evidenced-based practice templating in their electronic health records. Clinics can identify and treat urgent and immediate illnesses not usually addressed in emergency rooms.

Staff and Health Portals

In order for health portals to be functional there has to be acceptance from the staff as to the benefit along with encouragement of using the system. Miller, Latulipe, Melius, Quandt, and Arcury (2016) performed a qualitative study on staff. The themes that were identified were: feeling that the health portal was mandated, improved communication, and enhanced information sharing. Mold and Lusignan (2015), in a meta-analysis, identified staff were concerned about the extra workload however over time the health portal decreased their workload. Mold and Lusignan's (2015) review did find that there was a decrease in staff phone calls once the health portal was fully functional which freed the staff up to do other tasks. Email through the health portal was beneficial to the staff and patients. The researchers did recommend an examination of the staff's acceptance to online services, training of the system, and integrating the system into

the infrastructure and workflow pattern. Ultimately the use of the system is based off of the staff buying into the technology and embracing the use of the system.

Summary

In summary, the evidence points to the benefits of the health portal in the urgent care clinic setting. There is a lack of access to the health portal which is problematic for patients and staff. A literature review identified the importance of the health portal benefits and staff education regarding the health portal, health portal benefits, impact of patient-centered care, information technology leadership, and the importance of urgent care clinics. Also identified was the model which was applied to the project. In Section 3, the plan was outlined for the approach, methods, and evaluation of the project.

Section 3: Approach and Methods

Introduction

The purpose of this QI DNP project was to assess staff and patients' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology. The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education. After a review, analysis, and synthesis of the literature using the John Hopkins Grading Scale (Newhouse, et al., 2005) and applying it to the Walden literature matrix I identified some assessment tools. The tools used for this assessment were adapted technology acceptance questionnaires based off of the TAM (Davis, 1989), SMOG readability assessment (McLaughlin, 1969), Up to Date (Wolters Kuwler, 2016) resource, and the PEMAT-P tool (AHRQ, 2013). This third section will include the approach, population, strategies for recruiting, ethical protection, data collection, instrument, data analysis, and evaluation.

Approach and Rationale

There were two approaches to this needs assessment. The first was the quantitative needs assessment including the use of the TAM questionnaires (Davis, 1989), and the second was the evaluation of the top five diagnostic educational documents on the portal in relation to being evidence-based and meeting literacy guidelines. The TAM questionnaire was chosen to specifically focus on technology and the user's perception and acceptance. The PEMAT-P (AHRQ,2013), SMOG (McLaughlin, 1969), and Up to Date (Wolters Kuwler, 2016) tools were chosen due to their specificity to understandability, actionability, reading level, and current evidence-based practice comparison.

The outcomes of the project included an extensive review, analysis, and synthesis of the evidence found in the literature to support the health portal use in the clinic setting. The TAM questionnaires (Davis, 1989) for staff and patients were administered. Educational materials taken from the clinic's health portal were reviewed and qualitatively described. Lastly, an executive summary was prepared for system administrators with the findings.

Technology Acceptance Model

The technology acceptance model (Davis, 1989) utilized in this QI DNP project focuses on the end-user acceptance of technology health communication. The needs assessment of how staff and patients perceive technology and their willingness to accept and use the health portal was conducted.

Population

The project had two populations. The first group included the clinic manager, nurse practitioners, licensed nurses, x-ray technicians, and lab personnel. They were invited, after an explanation of the project, in a staff meeting to voluntarily participate. There were no psychological, relationships, legal, economic, or physical risks involved with this project population. There was no conflict of interest related to the research project. The second group included the clinic patients where a convenience sample was offered the questionnaire by the admissions clerk. The anonymous survey was given to consecutive patients when they checked in at the window, as permitted by clinic flow and illness severity. No incentives were provided and no attempt made to characterize the patients who did not participate in the survey. A letter of cooperation granting permission for all relevant data access, access to participants, facility use, and/or use of personnel time was obtained prior to the project implementation (Appendix G).

Staff Recruitment

The recruitment process for staff was in a staff meeting. Once the needs assessment was explained, volunteers were shown the consent form and offered the questionnaire to fill out (Appendix F). Staff must buy into and accept the health portal in order for the portal to be a functional communication tool. The questionnaire was filled out by the majority of staff (7). There were no incentives attached to the project.

Patient Recruitment

The patients were asked to participate in the project when they presented themselves at the urgent care clinic window. The admissions clerk asked each patient if he/she would like to participate in a short 5-10 minute questionnaire until 75 participants were obtained by convenience sample. Only patients 18 years of age or over were asked to participate in the project.

Ethical Protection of Participants

Walden University IRB approval was obtained by using Form A (Appendix H). Consent was obtained from each participant by reading the consent form then by placing the completed questionnaire in the locked secure box as acceptance of their willingness to participate freely. All the data collection was supervised by the clinic manager and managed by the DNP student with a letter of cooperation signed (Appendix G). The questionnaires did not have any identifying information. The admissions desk clerk signed a confidentiality agreement to prevent any disclosure of identifiers.

Data Collection for the TAM Questionnaire

Staff Data Collection

When the staff agreed to participate in the project, the consent was given to them for review and the questionnaire was presented to them on a clip board with a pen to complete the form. The questionnaire was in Likert scale format. The assessment was of the staff that was present at the meeting that day. Staff did complete the form at the meeting and some afterwards which allowed for privacy. The staff turned the form in to the student or the secured lock box. No names were included in the questionnaire portion to protect their identity. The survey was voluntary. The data will be stored in the secured container for five years. The return of the completed questionnaire indicated their consent.

Patient Data Collection

The admissions clerk introduced the project to the patients at the window. Once the patient agreed to participate in the voluntary project and the easily understandable consent form was reviewed, then the questionnaire was presented to the patient on a clip board with a pen to complete the form. Patient questionnaires were given out consecutively until the target number of 75 was reached. The questionnaire was in Likert scale format. There were no incentives offered. The patient's privacy was aided when taking the questionnaire by using a top cover sheet. No names were included on the questionnaire to protect the patient's identity. The patients returned the clip board with consent and questionnaire to the locked, secure file box. The data will be stored for at least five years.

Technology Acceptance Model Instruments

The TAM questionnaire was an adapted version of the technology acceptance tool (Davis, 1989). The questionnaire is divided into three sections. The form is scored with a 7-point Likert scale using the descriptors ranging from totally disagrees to totally agree. Also included on the form were statistical numerations ranging from -3 to +3 for further research detail, however, only percentages of the respondents was included. Section I for both staff and patients was designed to evaluate demographic attributes of the users. The data included sex, age, and highest grade completed. The patients' questionnaire included: health clinic choice, frequency of visits, and how often they visit the clinic. Section II of the questionnaire included the staff and patients' perceived usefulness and ease of use and if they would use technological devices. Section III, included the staff and patients' intention to use technology and their attitudes about the health portal.

Author's Permission

The TAM (Davis, 1989) is public domain and does not require permission to implement in a research setting.

Reliability and Validity of Instruments

Davis's TAM (1989) provided a valid and reliable measurement model that predicted the acceptance and use of the technologies by patients and staff. The tool achieved validity and reliability through two studies completed by Davis.

Or et al. (2011) performed a cross-sectional secondary analysis evaluating the technology-assisted nursing care system with adults with chronic disease. The TAM questionnaire was completed by 101 patients to measure the usefulness of technology. They identified that the usefulness was identified by 53.9% of the patients. The use of the technology

was used to search for health information 68.5% of the time. The study identified the ease of use to predict if the patients would accept using the health portal and self-report their health issues through a health portal.

Revisions of the Instruments

The TAM focuses on the end-user's acceptance of technology for health purposes and communication (Davis, 1989). Success of health communication through a health portal depends on the use of the technology by the target population. A few minor terminology changes were incorporated into the questionnaire by the DNP scholar to incorporate the health portal terminology. The questionnaires were coded by number to help with analysis. On the original tool the seven point Likert scale also included a scoring range: -3 totally disagree, -2 disagree, -1 slightly agree, 0 neither agree nor disagree, 1 slightly agree, 2 agree, 3 totally agree. These numbers were not used in the descriptive statistics; only percentages were calculated and described.

Data Analysis of the TAM Questionnaires

Quantitative descriptive analysis was collected and recorded in a MS Excel program and transcribed in the statistical package, Windows version 10 (Microsoft, 2016). A demographic profile was included in the questionnaire.

Evaluation of the TAM Questionnaire

The TAM questionnaire results were descriptive statistics and included the outcome of the questionnaires regarding the data from the Likert scale. Scores were computed by evaluating the mean of all the items in each section. Demographic data and clinic visits were also included. The questionnaire results identified whether the patients would utilize the education in the health portal for their educational needs. Once the data was gathered, evaluated, and synthesized the

information was put in an executive summary and will be presented to leadership at the clinic after graduation.

Assessment of Educational Materials Related to Evidence and Literacy

An analysis of the educational materials in the project was completed. Using the Patient Education Materials Assessment Tool-Print (AHRQ, 2013) the conditions assessed included: asthma, diabetes II, hypertension, bronchitis, and otitis media. The educational materials were also evaluated with the SMOG (McLaughlin, 1969) formula for readability assessment and with the Up to Date (Wolter Kuwler, 2016) evidence-based practice online site for current practice recommendations.

Patient Education Materials Assessment Tool (PEMAT-P)

The Patient Education Materials Assessment Tool (AHRQ, 2103) is an evidence-based systematic tool which is used to evaluate and compare the actionability and understandability of patient education materials. The actionable assessment on the tool focuses on diverse patient backgrounds and differing literacy levels. The patients can choose how they manage their health based off of the education given to them. The understandability assessment on the tool is where those patients process the education given to them and select appropriate concepts to apply to their situation. The PEMAT-P measures 17 items for understanding and seven for actionability. Shoemaker, Wolf, and Brach (2013) developed the PEMAT-P under contract to AHRQ with a research team working with a panel of experts in communication, content, health literacy, and patient education. The tool's content was based on items from existing instruments and concepts in other guides to assess and develop patient education materials. Four raters who were not trained how to use the PEMAT-P reviewed the reliability testing the tool which was then refined after their reviews of the tool's usage. Next the health consumers were tested and comparisons

with readability assessments were used to determine construct validity and measured understandability and actionability. The PEMAT-P tool demonstrated reliability, strong internal consistency, and evidence of construct validity (Shoemaker et al., 2013). The target goal of the understandability percentages for this project was 70% (Health Mirror, 2016). Some educational materials evaluated may have lower actionability percentages due to the higher amount of words defining the topic instead of actions to perform so the scores will vary (Health Mirror, 2016; Shoemaker, Wolf, & Brach, 2014). The educational materials which score appropriately on the PEMAT-P tool can be posted in electronic health records or on health portals for patient use.

To evaluate the appropriateness of the education in the health portal the evidence based PEMAT-P tool was utilized (AHRQ, 2013). Seven steps are used in the PEMAT-P to assess the patient education material (AHRQ, 2013). The scoring is completed through the website which includes:

1. Rating of the material for each line as disagree = 0, agree = 1, and not applicable = NA
2. Calculate the material's score for understandability.
3. Calculate the material's score for actionability.
4. Interpret the PEMAT-P scores.

Simple Measure of Gobbledygook Formula

The Simple Measure of Gobbledygook (SMOG) formula is a readability mathematical equation that utilizes regression analysis to predict readability of any text (McLaughlin, 1969). The formula is easy to calculate and one of the most valid tests to use. The SMOG takes into account the difficulty experienced by patients reading health care literature. Huang et al. (2014) used the tool and assessed 339 online patient education materials. Huang found that of the

website educational materials studied they were around 12.9 to 17.7 grade reading levels. The study identified that the SMOG tool was a better predictor for grade level than the other nine scales used. By revising patient education materials to a lower grade level, there may be greater comprehension for patients. The formula can be used to predict the reading difficulty of any patient educational materials.

The tool measures which have been found to have greatest predictive power are sentence length and words. The developer identified these measures are indicators of semantic and syntactic sources of reading difficulty. According to the developer word length is associated with precise vocabulary. This makes the patient struggle with extra effort in order to identify the full meaning of a long word because it is so precise. Also, long sentences usually have complex grammatical structure, which can make the patients struggle with immediate memory. This is due to them having to retain the content of several parts of each sentence before they can combine them into something that they can comprehend and apply to their situation.

The SMOG Grading formula is founded off of two principles; counting polysyllabic words and converting polysyllable counts into grades will give an acceptable assessment of the readability. The simple steps to the formula include:

- Step 1: Take the entire text to be assessed.
- Step 2: Count 10 sentences in a row near the beginning, 10 in the middle, and 10 in the end for a total of 30 sentences.
- Step 3: Count every word with three or more syllables in each group of sentences, even if the same word appears more than once.
- Step 4: Calculate the square root of the number arrived at in Step 3 and round it off to nearest 10.

- Step 5: Add 3 to the figure arrived at in Step 4 to know the SMOG Grade (the reading grade that a person must have reached if he is to understand full the test assessed.
- SMOG grade = 3 + Square Root of Polysyllable Count (McLaughlin, 1969)

Up to Date

Up to Date (Wolter Kuwler, 2016) is an evidenced based provider research tool. The system is accessible in the electronic health record application. Providers use the tool to research and investigate the most up to date information regarding illness and treatment.

Author's Permission

The PEMAT-P is provided by the Agency for Healthcare Research and Quality (AHRQ, 2013) site and is developed by government staff. The form is considered public domain for use within the United States, however citation is necessary. The SMOG (McLaughlin, 1969) is public domain and the Up to Date (Wolter Kuwler, 2016) tool is accessible via the clinic's electronic health record and was used with permission.

Reliability and Validity of the PEMAT-P and SMOG

PEMAT-P

Shoemaker, Wolf, and Brach (2013) developed the PEMAT-P under contract to AHRQ with a research team working with a panel of experts in communication, content, health literacy, and patient education. The tool's content was based on items from existing instruments and was a concept used in other guides to assess and develop patient education materials. Four raters who were not trained how to use the PEMAT-P reviewed the tool for reliability (AHRQ, 2013). Afterwards the tool was revised based off of the rater's suggestions. Next the health consumers were evaluated with the PEMAT-P and comparisons with readability assessments were used to

determine construct validity, measure understandability, and actionability. The PEMAT-P tool demonstrated reliability, strong internal consistency, and evidence of construct validity (AHRQ, 2013; Shoemaker, Wolf, & Brach, 2013).

If the material was understandable and actionable the PEMAT-P score would be higher. By using these scores the assessment would identify exceptionally good or poor educational materials. The target goal of the understandability percentages for this project was 70% (Health Mirror, 2016). Some educational materials evaluated may have lower actionability percentages due to the higher amount of words defining the topic instead of actions to perform so the scores will vary (Health Mirror, 2016; Shoemaker, Wolf, & Brach, 2014). The educational materials which score higher on the PEMAT-P tool can be posted in electronic health records or on health portals for patient use. The information obtained from this assessment was gathered, evaluated, and synthesized then added to the executive summary presented to the clinic leaders.

SMOG

Fitzsimmons, Micheal, Hulley, and Scott (2010) published a study that identified out of 100 website pages only 1% of the top ones were easily understood to the average person. They used both the Flesch-Kincade and the SMOG for evaluation. They found that using the SMOG was the preferred methodology for measuring healthcare material's readability. Parkinson's disease information websites which they reviewed required major text revision to meet the SMOG standards for the average patient to be able to understand, around 8th grade. Myers and Shepard-White (2004) noted that the SMOG evaluated the readability grade of patient education materials within 1.5 grades of accuracy.

Summary

The purpose of this section has been to describe the approach and methods in data collection and analysis for both the TAM questionnaires (Davis, 1989). The educational materials were evaluated with the PEMAT-P (AHRQ, 2013), SMOG (McLaughlin, 1969), and the Up to Date (Wolter Kuwler, 2016). The TAM tool was discussed, along with the targeted population. Ethical considerations were included as to how the data would be collected and stored. In Section 4, the findings of the questionnaires will be discussed including assessment findings, evaluation, data analysis, implications for future research, strengths, limitations, and analysis of myself as the project leader.

Section 4: Findings, Discussion, and Implications

Introduction

The purpose of this QI DNP project was to assess staff and patients ' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology. The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education. The QI DNP project goal was to provide leadership with information to help determine whether or not to open the health portal for staff and patients. The technology acceptance model (Davis, 1989) was the framework for the project. The outcomes of the DNP project included analyzing and synthesizing evidence-based literature, administering the revised TAM questionnaire to staff, and administering the revised TAM questionnaire to patients. As well, the patient education information for the top five chronic diseases were analyzed with the Patient Education Materials Assessment Tool (AHRQ, 2013), SMOG (McLaughlin, 1969) and with the Up to Date (Wolter Kuwler, 2016) to determine the quality of education through the health portal. Lastly, an executive summary was prepared for system administrators with the results of both activities to promote the activation of the health portal at the urgent care clinic. The purpose of this section is to explain the findings of the TAM questionnaires for both staff and patient and the assessment of the educational materials found in the health portal for functionality.

Evaluation, Findings, and Discussion

This QI project utilized the TAM questionnaires filled out by staff and patients to help determine the usability and acceptability of a health portal in an urgent care setting. Descriptive statistics were used to organize and summarize the characteristics of the urgent care sample population.

Outcome 1 Literature Review Matrix (Appendix K)

The objective of the analysis and synthesis of evidenced-based literature was initiated early in the project process. The comprehensive literature review related to health portals, patient centered technology, and leadership concepts. Evidence from the literature supported the use of a health portal in clinical practice with benefits to patients and staff (Aberger, Migliozzi, Follick, Malick, & Ahern, 2014; Fiks et al., 2015; Gany et al., 2011). The evidence identified served as the foundation for the project to promote closure of the health portal accessibility gap. Another part of the project was researching the literature for the best assessment tools to evaluate the educational materials. Three tools were identified through the analysis: PEMAT-P (AHRQ, 2013), SMOG (McLaughlin, 1969), and with the Up to Date (Wolter Kuwler, 2016). The PEMAT-P was utilized for the educational material's actionability and usability for the patients. The SMOG test analyzed the readability level of the educational document. Finally, an evaluation of the current practice recommendations in the Up to Date website were evaluated for the project.

Outcome 2 TAM Questionnaire Staff (Appendix M)

Once IRB approval was gained and the clinic director clearance had been obtained the project assessment commenced with administration of the TAM questionnaire to staff who volunteered to participant. All the appropriate measures were taken as listed in Section 3 to gather data.

Staff assessment. The questionnaires were administered to staff at a leadership meeting prior to the opening of the clinic. I led the meeting and explained the TAM

questionnaires and what the project entailed. Once the staff members were aware of the project and the plan they read and acknowledged the consent form, voluntarily filled in the questionnaires and returned them to me to file in the locked, secured box. The average time to fill out the survey was around 10 minutes with some discussion regarding the health portal use and benefits in practice at the clinic. Using descriptive statistics the sample was assessed as to how the health portal would be accepted by the staff. A convenience sample of staff (*N*=8 out of 12 staff members) at the urgent care clinic participated in the project. The nominal questions related to the staff's demographics are described. Their gender distribution was two males and six females and mean ages ranged from 30 to 59. Their educational levels obtained ranged from diploma to PhD.

TAM staff questionnaire aggregation. By evaluating the TAM questions for the urgent care population we could get an idea of how much the patients would be willing to utilize the patient-centered technology. Davis (1989) developed a standardized questionnaire which measures technology acceptance. The questionnaire had two sections; one section identified measured usefulness, and ease of use. The second section included items which measured attitudes and intention to use the health portal. The respondents were given a TAM questionnaire with a 7 point Likert scale as to their agreement to the question. The questions were repeated on purpose to help prevent any bias. Each section had specific questions that went with each electronic use topic (Table 1).

Table 1

Staff Aggregation of Question Topics

Section I	Question	TD	D	SD	N	SA	A	TA
Perceived Use								
	2. I know what a Health Portal is and provides for my patients	12.5% 1				25% 2	12.5% 1	50% 4
	7. The use of the Health Portal may improve the monitoring of the patient's health status				25% 2	12.5% 1	37.5% 3	25% 2
	16. I have already used a Health Portal to care for myself	25% 2			37.5% 3		25% 2	12.5% 1
	22. I feel like the Health Portal will be useful to improve my patients health care and will be easy for them to use		12.5% 1	12.5% 1	25% 2		25% 2	25% 2
Totals	Total in agree categories 20 Total number of choices 8 x 4 = 32 Total agreement responses 20/32 = 62%	3	1	1	7	3	8	9
Perceived Ease of Use								
	3. I think that I could easily learn how to use Health Portal	12.5% 1				12.5% 1	37.5% 3	37.5% 3
	8. I think it would be easy for patients to monitor health by using the Health Portal				25% 2	12.5% 1	37.5% 3	25% 2
	19. I think I will find it easy to acquire the necessary skills to use the Health Portal at the clinic				37.5% 3	12.5% 1	25% 2	25% 2
	23. I think that the Health Portal will be easy for me to use				37.5% 3	12.5% 1	25% 2	25% 2
Totals	Total in agree categories 23 Total number of choices 8 x 4 = 32 Total agreement responses 23/32 = 72%	1				4	10	9
Section II								
Attitudes								
	4. I think it is a good idea to use the Health Portal	25% 2			12.5% 1	12.5% 1	25% 2	25% 2
	12. The Health Portal will promote education for the patients by providing them with access to their health care diagnosis to make it easier for them to follow advice				37.5% 3		25% 2	37.5% 3

	13. The Health Portal will promote wellness by providing them with a list of their immunizations and vaccines				25% 2		37.5% 3	37.5% 3
	18. The use of the Health Portal is beneficial for my patient's care							
	24. In my opinion, the use of the Health Portal will have a positive impact on my patient's health care		12.5% 1		25% 2	12.5% 1	25% 2	25% 2
Totals	Total in agree categories 20 Total number of choices 7 x 4 = 28 Total agreement responses 20/28= 71%	2	1	0	8	2	8	10
Intention to Use								
	5. I have the intention to fully use all of the Health Portal functions when it becomes available in the clinic	25% 2			12.5% 1	12.5% 1	12.5% 1	37.5% 3
	9.The use of the Health Portal will make my job easier				37.5% 3	12.5% 1	37.5% 2	12.5% 1
	15. I have the intention to facilitate the use of the Health Portal to provide information to other healthcare providers				50% 4		25% 2	25% 2
Totals	Total in agree categories 13 Total number of choices 8 x 3 = 24 Total agreement responses 13/24 = 54%	2			8	2	5	6

Note. Legend: TD- totally disagree, D- disagree, SD- slightly disagree, N- neither agree nor disagree, SA- slightly agree, A- agree, TA- totally agree

For the staff the questions in section I, 62% of the responses of the eight staff members surveyed agreed that they knew what the health portal was and felt it was useful. Staff felt that by using the health portal they may have improvement in monitoring their patient's health. Some had used the health portal for their own care. They did feel like it was useful for their patients' care and would be easy for them to use. Also noted was three of the eight staff had ever used a health portal and knew what the portal was. Included in section I, 72% of the responses of the eight staff members surveyed agreed that the health portal would be easy to use. Overall the numbers were in the "agree" and "totally agree" categories.

For the staff in section II, 71% of the responses of the eight staff members surveyed agreed that the health portal would be useful to improve their patients' health care. Five staff members did think using the health portal was a good idea and would promote education for the

patients by providing access to their health care diagnosis. Another benefit of the health portal is to promote wellness by providing the patient with a list of their immunizations and vaccines which the staff felt was beneficial for their patients' care. Also in section II, 54% of the responses of the eight staff members surveyed agreed that the health portal was something they would use and would make their job easier. Overall the numbers are in section were in the "totally agree" category. The staff had the intention to fully use all of the health portal functions when it became available in the clinic and would facilitate using the health portal to provide information to other healthcare providers.

TAM staff questionnaire. The findings of the TAM questionnaire given to the staff (N = 8) are displayed in Appendix M. The staff (62.5%) agreed that they felt comfortable with information and communication technology. Fifty percent of the staff" totally agreed" and knew what the health portal was and provided to the patients. Most of the staff agreed (37.5% agreed, 37.5% totally agreed) that they could easily learn how to use the health portal. Twenty-five percent of the staff disagreed that using the health portal was a good idea but fully intended to use all the health portal functions when they become available to them. Most (37.5% agree, 37.5% totally agreed) that the use of the health portal could help them monitor their patients' data quicker. Some of the staff were neutral (37.5%) about the portal being easy for the patients' to use. Half of the staff responses were neutral (50%) and half (25% agreed, 25% totally agreed) about using the communication tab in the health portal helping them to be better able to communicate with their patients.

Over half (12.5% slightly agree, 25% agree, 25% totally agree) felt that renewing the patients' prescriptions would be easier with the health portal use. Over half (25% agree, 37.5% totally agree) agreed that the health portal would promote education for the patients by providing

them with access to their healthcare diagnosis and make it easier for them to follow advice. Over half (37.5% agree, 37.5% totally agreed) felt that the health portal would promote wellness and aid the staff with listing out the patients needed immunizations and vaccines. Many (25% agree, 37.5% totally agreed) of the staff felt the health portal was interesting to use for patient care. Half (25% agree, 25% totally agree) of the staff have the intention to use the health portal to provide information to other healthcare providers. Less than half of the staff use a health portal themselves for their healthcare (25% agree, 12.5% totally agree).

Over half of the staff felt that the health portal could facilitate their patients' care (37.5% agree, 25% totally agree). The majority (12.5% slightly agree, 25% agree, 25% totally agree) felt that they would find the portal easy to acquire the necessary skills to use the health portal at the clinic, but only if they had some training (12.5% slightly agree, 25% agree, 37.5% totally agree/ 75%). Over half (12.5% slightly agree, 25% agree, 25% totally agree) of the staff felt they would facilitate the use of the health portal if they had access to technical assistance, and the majority used computers at work already (12.5% agree, 62.5% totally agree). The extra comments are included in Appendix J.

Outcome 3 TAM Questionnaire Patient (Appendix N)

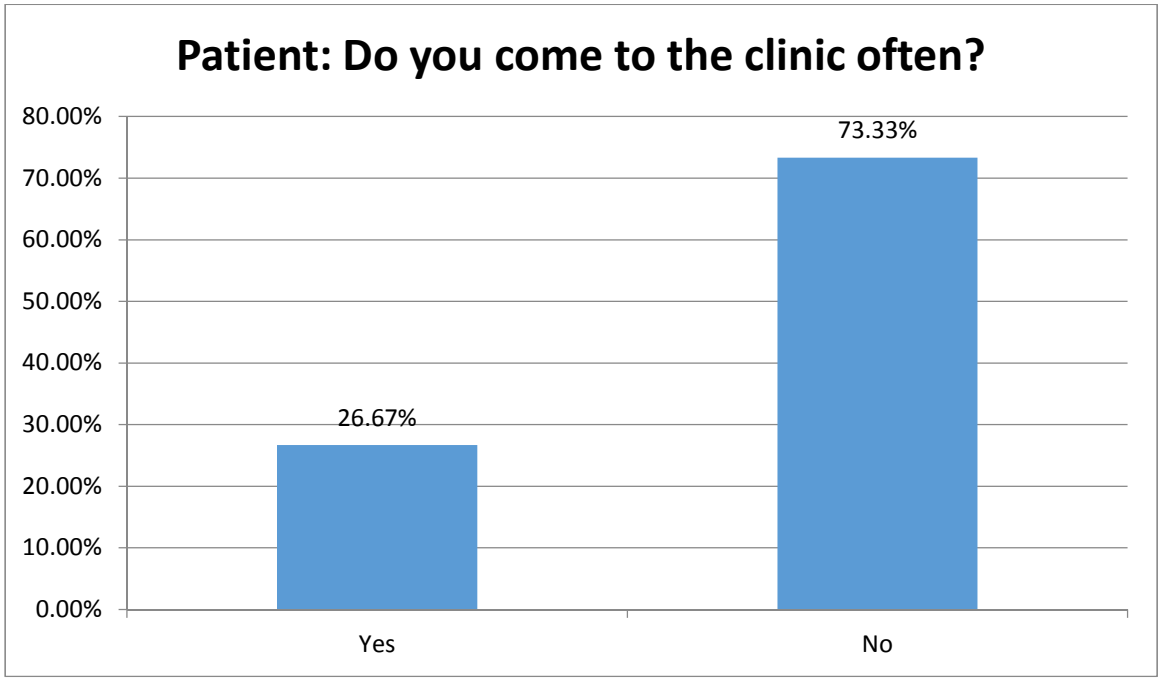
Patient assessment. The questionnaires were administered to the urgent care clinic patients at the admissions clerk window for a convenience sample. I led the initiative and explained the TAM questionnaires and what the project entailed to the admissions clerk. Once the clerk was aware of the project and the plan she voluntarily passed out the questionnaires to the clinic patients and returned them to the student to file in the locked, secured box. The average time to fill out the survey was around 10 minutes. Using descriptive statistics the sample was assessed as to how the health portal would be accepted by the patients.

A convenience sample of the patients (*N* = 75) at an urgent care clinic was surveyed. The 75 samples were taken using the average number of patients seen in a day. The nominal questions relating to the patients' demographics are as follows. The gender of patients was 58.67% males (*N* = 44) to 41.33% females (*N* = 31). The age groups who used the clinic most were 30-39 (33.33%/25) and 50-59 (22.67%/17). The highest grade levels obtained was in the high school diploma range at 57.33% (*N*= 43). Of all the patients (*N* = 36) 48 % did not have a healthcare provider other than the urgent care clinic. Those patients 73 .33 % (N = 55; Figure 1) did not come to the clinic very often for their primary care needs.

Figure 1

Patient' Frequency Distribution by Clinic Use

	Yes	No	Total
N	20	55	75
%	26.67	73.33	100

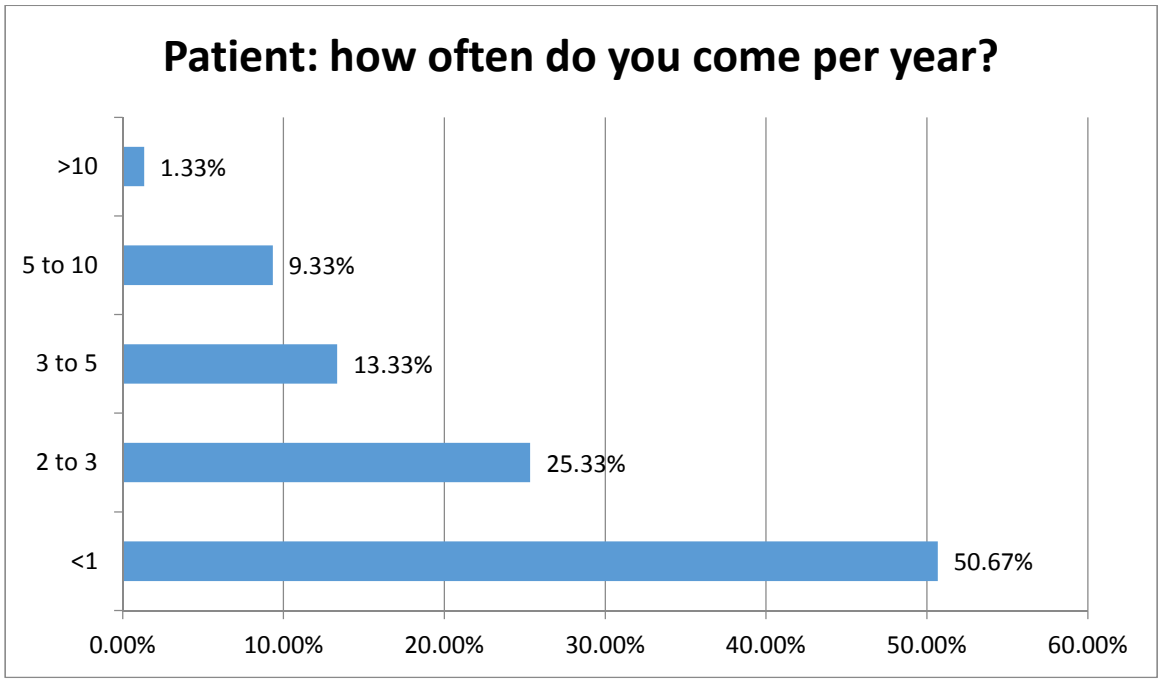


When the patients' did come it was less than one time per year (50.67%), 2-3 times per year (25.33%), 3-5 times per year (13.33%), 5-10 times per year (9.33%) or greater than 10 times per year (1.33%; Figure 2).

Figure 2

Patient' Frequency Distribution by Total Patient Visits Per Year (N = 75)

Visits per Year	< 1	2-3	3-5	5-10	>10	Total
N	38	19	19	7	1	75
%	1.33	9.33	13.33	25.33	50.67	100



TAM patient questionnaire. The sections had specific questions that went with each electronic use topic (Table 2).

Table 2 Patient Aggregation of Question Topics

Section I	Question	TD	D	SD	N	SA	A	TA
Perceived Use								
	2. The use of the Health Portal could help me to monitor my health care data quicker.	4.0 % 3	2.67 % 2	4.00 % 3	8.0% 6	10.67% 8	32.24 % 24	38.67 % 29
	7. The use of the Health Portal may improve the monitoring of my health status	4.0 % 3	1.33 % 1	2.67 % 2	22.67 % 17	17.33% 13	21.33 % 16	30.67 % 23
	16. I have already used a Health Portal to care for myself	22.67% 17	14.67% 11	5.33 % 4	22.67 % 17	6.67 % 5	8.0% 6	20.0 % 15
	22. I feel that the Health Portal will be useful to improve my health care	4.0 % 3	1.33 % 1	5.33 % 4	34.67 % 26	9.33 % 7	16.0 % 12	29.33 % 22
Totals	Total in agree categories 180 Total number of choices 75 x 4 = 300 Total agreement responses 180/300 = 60%	26	15	13	66	33	58	89
Perceived Ease of Use								
	3. I think that I could easily learn how to use Health Portal	4.0 % 3		5.33 % 4	9.33% 7	14.67% 11	22.67 % 17	44.0 % 33
	8. I think it would be easy to monitor my health by using the Health Portal	4.05 % 3		4.0% 3	17.33 % 13	20.0 % 15	18.67 % 14	36.0 % 27
	19. I think I will find it easy to acquire the necessary skills to use the Health Portal	2.67 % 2	2.67 % 2	4.0% 3	18.67 % 14	13.33% 10	25.33 % 19	33.33 % 25
	23. I have the intention to use the Health Portal on a regular basis	4.0 % 3	4.0 % 3	6.67 % 5	33.33 % 25	10.67% 8	17.33 % 13	24.0 % 18
Totals	Total in agree categories 210 Total number of choices 75 x 4 = 300 Total agreement responses 210/300 = 70%	11	5	15	59	44	63	103
Section II								
Attitudes								

	4. I think it is a good idea to use the Health Portal	4.0 % 3		4.0% 3	14.67 % 11	16.0 % 12	24.0 % 18	37.33 % 28
	12. I believe that the website in the Health Portal would be clear and easy to understand	2.67 % 2	4.0 % 3	2.67 % 2	21.33 % 16	21.33% 16	21.33 % 16	26.67 % 20
	13. I think that the Health Portal is flexible technology that is easy to interact with	2.67 % 2	4.0 % 3	4.0% 3	26.67 % 20	17.33% 13	17.33 % 13	28.0 % 21
	18. The use of the Health Portal is beneficial for my care	6.67 % 5	1.33 % 1	4.0% 3	28.0% 21	14.67% 11	16.0 % 12	29.33 % 22
	25. I think that the Health Portal will be easy to use	4.0 % 3	1.33 % 1	5.33 % 4	21.33 % 16	18.67% 14	18.67 % 14	3.67 % 23
Totals	Total in agree categories 253 Total number of choices 75 x 5 = 375 Total agreement responses 253/375 = 73%	15	8	42	84	66	73	114
Intention to Use								
	5. I have the intention to use Health Portal when it becomes available in my clinic	4.0 % 3	2.67 % 2	4.0% 3	18.67 % 14	10.67% 8	25.33 % 19	34.67 % 26
	9. I will welcome the use of the Health Portal	4.0 % 3	1.33 % 1	2.67 % 2	22.67 % 17	16.0 % 12	20.0 % 15	33.33 % 25
	15. I have the intention to use the Health Portal when necessary to provide information to other healthcare providers	4.05 % 3	1.33 % 1	8.0% 6	16.0% 12	16.0 % 12	20.0 % 15	34.67 % 26
Totals	Total in agree categories 158 Total number of choices 75 x 3 = 225 Total agreement responses 158/225 = 70%	9	4	11	43	32	49	77

For the patients' questions in section I, 60 % of the responses of the 75 patients surveyed agreed that they knew what the health portal was and felt it was useful. Only 26 of the 75 patients had ever used a health portal and knew what the portal was. Included in section I, 70% of the responses of the 75 patients surveyed agreed that the health portal would be easy to use. Overall the numbers were in the "agree" and "totally agree" categories. The patients felt the use

of the health portal could help them monitor their health care data quicker and improve their health status. Only 39 of the 75 had the intention to use the health portal on a regular basis. The numbers for how patients perceive using the health portal were in the "neither agree nor disagree" category and the perceived ease of use are in the "slightly agree" category. They felt that they could learn about the health portal and would find it easy to acquire the skills needed.

For the patients' in section II, 73% of the responses of the 75 patients surveyed agreed that the health portal would be useful to improve their health care. Patients (56%) felt that using the health portal would not stop them from using another provider to follow up with. Most felt the health portal was a good idea, would be easy to understand, and would be easy to work with. The health portal would be beneficial to the patients' care overall.

Also in section II, 70% of the responses of the 75 patients surveyed agreed that the health portal was something they would use. The majority (71 %) felt they would use a health portal to provide information for other healthcare providers when needed. Overall the numbers were in the "slightly agree" category. The patients did have the intention to use the health portal when it became available.

TAM patient questionnaire. The findings of the TAM questionnaire given to the patients ($N = 75$) are displayed in Appendix P with identifying percentages. The majority of patients felt comfortable with information and communication technology (9.46 % slightly agree, 21.62% agree, 44.59% totally agree). Most patients agreed that they could easily learn how to use the health portal (14.67% slightly agree, 22.67% agree, 44.0% totally agree/81%) and thought it was a good idea (16.0% slightly agree, 24% agree, 37.33% totally agree/77.33%). The patients did have the intention to use the portal when the feature becomes available to them (10.67% slightly agree, 25% agree, 34.67% totally agree/70%) and felt that the health portal

would cause them to change their health behaviors (10.67% slightly agree, 9.35% agree, 10.67% totally agree).

Most of the patients felt that the health portal would improve monitoring of their health (17.3% slightly agree, 21.3% agree, 30.67% totally agree) and welcomed the use of the health portal (16% slightly, 20% agree, 33.3% totally agree). Half felt like they had access to the necessary infrastructure to support using the health portal (12.0% slightly agree, 18.67% agree, 40% totally agree) and felt that the health portal could help them get the most out of their healthcare (14.67% slightly agree, 14.67% agree, 34.67% totally agree). They believed that the website in the health portal would be clear and easy to understand (21.33 % slightly agree, 21.33% agree, 26.67% totally agree), felt it was easy to interact with (17.33 % slightly agree, 17.3% agree, 28% totally agree), and the technology would be interesting to try to use for their medical care (17.3% slightly agree, 18.67% agree, 29.33% totally agree). Less than half of the patients actually use a health portal for their care now at other clinics (6.67% slightly agree, 8% agree, 20% totally agree). The patients' did find the skills would be easy to acquire (13.3% slightly agree, 25.3% agree, 33.3% totally agree), and would use all the health portal technology if they had some training; (16% slightly agree, 20% agree, 29.3% totally agree/66%).

The patients (13.3% slightly agree, 12% agree, 30.67% totally agree) were not agreeable that the health portal would be welcomed by other healthcare providers that they went to, but half (9.33% slightly agree, 16% agree, 29.3% totally agree) felt that the portal would be useful to improve their care (10.67 % slightly agree, 17.3% agree, 24% totally agree). Over half (12% slightly agree, 21.3% agree, 28% totally agree) would use the health portal if they had access to technical assistance and the majority of patients use computers at work already (6.67% slightly agree, 14.67% agree, 42.67% totally agree). The extra comments are included in Appendix J.

The result of the TAM assessment is a good prediction of the staff and patients' intention to use the health portal in their practice and for their own health care. The results of this assessment are important because they identify key things that should be considered prior to the planning and implementation of using patient-centered technology. To improve the acceptance of using health portals administration should provide appropriate and adequate training, strong infrastructure, and technical aid to facilitate proper use for the staff and patients. The staff can educate their patients on the health portal and support them using it. Overall the assessment was more positive from the patients than the staff. Healthcare providers are the most important link for patient's healthcare. We have a direct role in facilitating patient-centered care in practice. Patients would be more inclined to use the health portal if they have their healthcare providers' support.

Outcome 4 Educational Materials Assessment Evaluation (Appendix L)

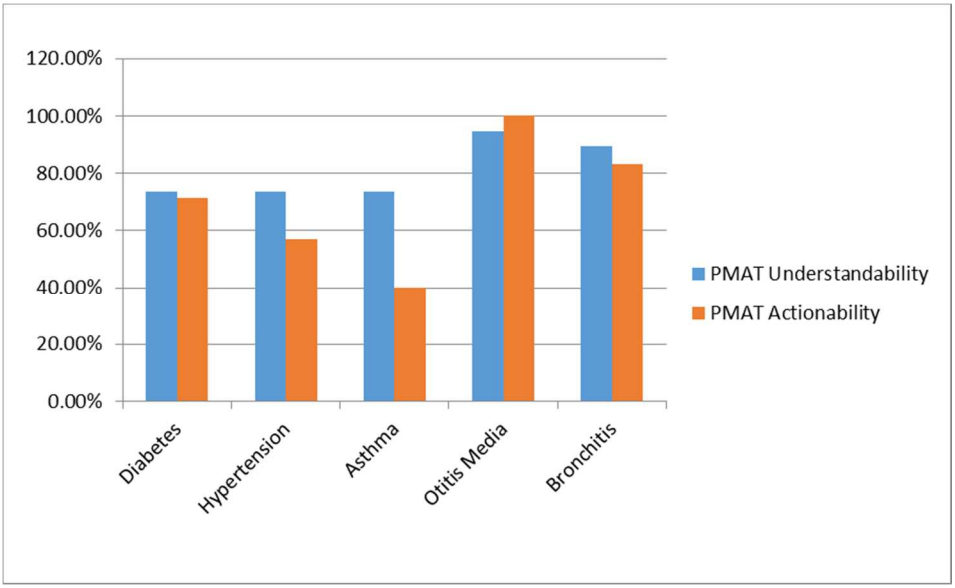
The patient education information for the top five chronic diseases of patients in the clinic were analyzed with the Patient Education Materials Assessment Tool [PEMAT-P] (AHRQ, 2013; Table 5), SMOG (McLaughlin, 1969; Table 6), and with the Up to Date (Wolter Kuwler, 2016).

Patient education materials assessment tool-printed. The PEMAT-P (AHRQ, 2013) scores measure the understandability and actionability of the educational materials offered in the health portal to patients (AHRQ, 2013). The tool identifies whether the material read can be easily understood. The tool also looks at whether the person can apply the information and take action towards better health due to the educational materials presented to them. The target goal of the understandability percentages for this project was 70% (Health Mirror, 2016). Some educational materials evaluated may have lower actionability percentages due to the higher

amount of words defining the topic instead of actions to perform so the scores will vary (Health Mirror, 2016; Shoemaker, Wolf, & Brach, 2014). The PEMAT-P scores showed above a 70% for understandability and ranged from 40% to 100% on actionability on the top five common diagnoses (Figure 3). The educational materials were all deemed understandable (74-95%), and the diabetes, otitis media and bronchitis were actionable (71-100%) except for the actionability for hypertension (57%) and asthma handouts (40%) due to the higher content in definitions instead of actions to perform. All educational handouts were understandable and actionable.

Figure 3

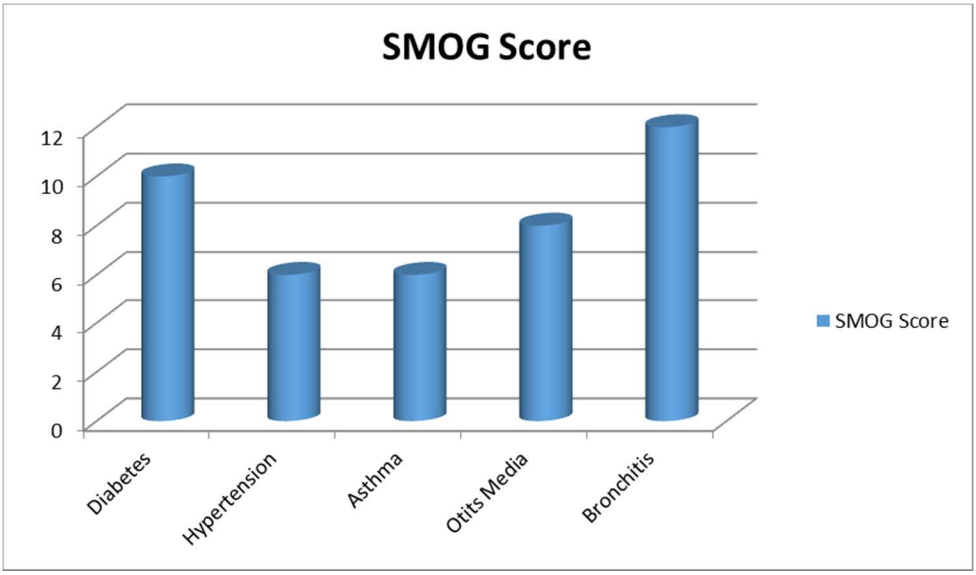
PMAT Scores



Simple measures of gobbledygook. The SMOG (McLaughlin, 1969) score is a formula used to determine the grade level of educational materials. The SMOG score for the educational materials in the health portal ranged from 5th grade to above 12th grade (Figure 4). The handouts on hypertension, asthma, and otitis media had appropriate reading levels (6-8th grade). However, the diabetes (10th grade) and bronchitis (above 12th grade) educational handouts need to be changed to improve readability to less than 8th grade reading level.

Figure 4

SMOG Scores



Up to Date. The Up to Date (Wolter Kuwler, 2016) review of the top diagnoses for educational materials that are found in the health portal matched the content in the site. The content was current and applicable in practice. The evidence based practice guidelines were included in the content of the educational materials.

Educational Materials Assessment Discussion

The assessment of the educational materials identified a PEMAT -P (AHRQ, 2013) understandability of above 74% for all the handouts. The target goal of the understandability percentages for this project was 70% (Health Mirror, 2016). Some educational materials evaluated may have lower actionability percentages due to the higher amount of words defining the topic instead of actions to perform so the scores will vary (Health Mirror, 2016; Shoemaker, Wolf, & Brach, 2014). The PEMAT-P for actionability ranged from 40-100% which identified after further review identified a higher content on definitions than action words however were still appropriate for use.

The educational tool could be discussed with the vendor and educational reading level changed to SMOG (McLaughlin, 1969) assessment criteria. These could be uploaded back into the educational portal under the "easy-to-read" handouts. The SMOG assessment of literacy grade level ranged from 5th grade to above 12th grade. Two handouts, on diabetes and bronchitis, needed to be simplified by the educational provider to reduce reading level to 8th grade since they were higher than 10th grade readability. All of the educational documents were compared through the Up to Date (Wolter Kuwler, 2016) application which were found to be appropriate treatment guidelines and current evidence-based practice.

Outcome 5 Executive Summary

The final project outcome includes an Executive Summary of the project and is presented in Section 5 of this paper. The summary will be provided to administration of the urgent care clinic to increase their knowledge of the health portal and the potential benefits. The summary hopefully will be well received by administration and potentially will help to make the decision to open the health portal.

Applicability to Healthcare Practice

The application of health portals to healthcare practice is significant. Electronic health records are continually changing and molding to what providers need, however, patient needs are last on the agenda for adaptability with education being an optional choice on Meaningful Use incentives (U.S. Government, 2014a). Results of the questionnaires showed that the attitudes of the staff toward the health portal were overall positive. There were some reservations about the application being opened prior to extensive staff education regarding the function of the system. The staff resistance to applying the health portal into practice can hinder the functionality of the system.

The patients had a positive attitude towards the health portal and the functionality of the portal for them as a patient at the urgent care clinic. The patients actually thought the health portal would be easier to use than the staff did with most thinking the portal was a useful application. By utilizing the technology and specifically the health portal for their care patients have the potential to enhance their health status. For those with long term illnesses the use of the health portal can help provide a place for all their data to be logged.

The review of the top five clinical diagnoses was completed. The levels of readability were around the 6th grade level with one rising above the 12th grade which identified the need to revise two of the internal documents to promote ease of reading down to an 8th grade level. According to the assessment the patient's average grade level was 12th grade reading level (57.3%). With the majority of patients having a 12th grade education the education found in the health portal is appropriate. The PEMAT-P (AHRQ, 2013) scores were appropriate for the urgent care population. The educational materials were current with up to date practice and the

handouts were evidence-based. Overall the health portal function and educational materials were appropriate and wanted by both patients and staff at the urgent care clinic.

The executive summary was developed and the plan is to share the summary with the clinic manager and Chief Executive Officer to give them information to offer at the board meeting to help encourage administration to open the health portal.

Implications

Policy

An appropriate policy for the health portal would include the promotion of the use of health portals in all clinical practice settings. The government programs need to be expanded to make this a requirement.

Practice

Health portals can be used in my practice to facilitate communication with patients. This feature is extremely important for the urgent care population due to the need for a follow up visit after the treatment modality has been completed. If the patient does not return for a follow up visit the patient may not be completely healed and may have complications or dire consequences. As a practitioner having a health portal to utilize can help facilitate encouragement to return for a follow up appointment and can foster patient-centered care.

Research

This assessment of health portals for both staff and patients will hopefully encourage an interest in patients who like digital technology and wish to pursue more data to promote electronics in practice. Since there is limited literature on the subject hopefully the project will help identify a need. Prior use of the TAM (Davis, 1989) was shown to identify patients who will

use the technology and apply it to their daily life. Larger studies would be beneficial in getting enough data to promote government funding of health portal projects in the future.

Social Change

The project's findings will hopefully bring about social change in the health care arena, particularly the urgent care setting. Urgent care clinics are being used as primary care clinics which has been a problem for those needing chronic care. Hopefully promoting the health portal use in practice will bring the problem of lack of access to their health records to use at return visits and promotion of educational materials at urgent care clinics to the forefront.

Strengths and Limitations of the Project

Strengths

The strengths of the study included the large convenience sample size. Sample size was chosen off of the average population per day in the clinic. The average was around 70 patients per day which made a sample of 75 patients appropriate. Another strength, of the project was the appropriateness of the questionnaire in assessing the patients' and staff's perceptions and usage of the health portal in practice and for the patient's healthcare needs.

Limitations

The limitations included a surprising amount of patients who refused to participate in the study which may have been due to their discomfort of answering questions about health portals or that they just did not want to participate. If educational posters had been put up in the waiting room to explain the study and encourage taking the questionnaire the sample possibly could have had more variety of patients. Another limitation was that the TAM model does not take into account the person's experience with technology (Davis, 1989). The questionnaire implied that the user already knew what a health portal was and could do for them. For staff the technology

would build off of what they already have in place. Those who use technology already are more experienced and did find the health portals easy to use both on the job and for their personal health use. Also for consideration is the fact that staff will have to adapt to using the technology.

Recommendations

Future research is needed regarding the health portal use and should focus on what the person's experience is with technology and how long they have been using the health portal. One recommendation would be to put the questionnaire online through email for the patients at the clinic to identify those already engaged with technology and healthcare.

Analysis of Self

Scholar

As a DNP scholar, I have a duty to identify scientific foundations for nursing practice according to the American Academy of Colleges of Nursing Essentials (2006). This project enlightened me on the process of research and the importance of scholarly review of the literature. I was surprised at the lack of information available on health portals in the library system and on google scholar. As a DNP scholar researching the topic and finding the evidence is an integral role. We can no longer keep this information from our patients as the age of information technology progresses into the future. As a scholar, in reviewing the literature I identified and quickly translated the knowledge identified to seek out a way to assess the needs of the urgent care clinic population. There was an immediate need to identify the actions needed to promote the health portal for the patients' access and educational needs. Once the project continued on and after discussing health portals with the staff I realized that there was a lack of knowledge of the health portal usage with the staff. This information led me to focus on the staff as well as patients.

Practitioner

As a practitioner, the project was integral to patient care at the urgent care clinic. There are nurse leaders who specialize in informatics, which is one thing that would be of interest to me in the future (AACN, 2015). One of the goals of informatics in a clinic setting is to facilitate communication between providers and patients while pursuing a high quality of care (Herrin & Cabibbo, 2013). The project helped to identify the need for practitioners to be involved in patient engagement and their educational information. As practitioners, the business of medicine focuses more on reimbursements then patient engagement. The trend should be patient engagement as the primary focus. By opening up the health portal the practitioner is promoting smarter designed templates and more efficient EHR. I have "throughout" the project's inception promoted advanced practice nursing by facilitating the activation of the health portal while promoting quality outcomes (Aberger et al., 2014; Fiks et al., 2015; Gany et al., 2011; Herrin & Cabibbo, 2013). These quality outcomes are visions of the Office of the National Coordinator (ONC; U. S. Government, 2013) and the Center for Medicare and Medicaid Services (U. S. Government, 2014). As we see the EHR grow and the incentives increase by CMMS more financial rewards will be sanctioned in order to continue the progression that has been accomplished and will continue to support the use of technology in practice, both for the staff and patients (U.S. Government, 2014). I was surprised by the amounts of money available to the providers who meet the quality EHR guidelines and make their practices "meaningful". Another interesting finding was the limited information the clinics receive about how to implement the technology in practice. Essential IV of the AACN (2006) includes the ability to utilize and apply information technology in practice is key to integration of the DNP in the clinical practice setting.

Project Manager

As project manager, I learned a significant amount of information regarding meaningful use and the government's plan for the future of healthcare and the health portal application in the practice setting. I found the process intimidating to come in and evaluate the providers as they worked with the new EHR system. Many grumbles were heard regarding technology use in practice, so when the questionnaire was given out and reviewed, I was interested to see that more of them did not give a negative review of use. I got the feeling the primary problem was a lack of appropriate training for staff. Since they had recently switched EHR and only had two days of orientation with the new system the staff were not happy with the new system. When the health portal was mentioned there was some distress over how the health portal worked and what the health portal would involve the practitioner and staff to do. As the project manager, I concluded that after a few weeks the project was going to work out without any difficulty. The staff was very welcoming and receptive to information that I was sharing regarding EHR in practice. The whole process of organization and preparation was time consuming however very helpful when the time came with IRB permission to begin. I was prepared to start collecting data immediately. The reception of data collection was excellent and I received help from the desk clerk to keep the flow moving with patients. I stayed within my Gantt chart deadlines (Appendix F).

Professional Development

The DNP project promoted my growth as a professional exponentially. Reviewing literature for current evidence to support health portals was eye opening and a somewhat difficult task. The process of scholarly writing to this depth has become a true journey and very worthwhile. All the assistance and guidance from my mentors who have challenged me to look at

things in a different light has been amazing. I have grown as a leader in practice by partnering with my peers for the project. I have been blessed by my experiences and feel I have grown significantly both professionally and personally through this doctoral journey.

Summary

The problem identified in the QI DNP project was that although the EHR has been in the facility for the past six years, the health portal was never made available to staff and patients which caused a gap in services. Patients should have access to their health records at any time and have better communication with healthcare providers. The purpose of this QI DNP project was to assess staff and patients' knowledge of the technology for accessing the health portal on the electronic medical record and their intent to use that portal if opened up. Access to the health portal could lead to better outcomes for the patient and help promote compliance with medical advice and unwarranted disease progression (Hussain et al., 2015; Koonce et al., 2007; Maez et al., 2014; Pinnock, & Thomas, 2015). The technology acceptance model (Davis, 1989) used assessed the perceived usefulness, perceived ease of use, intention to use electronics, and the attitude of the new user towards the technology for the staff and patients and to overcome the barriers of use. The assessment identified the majority (62.5%) felt that they would find the portal easy to acquire the necessary skills to use, but only if they had some extra training (75%). The staff attitude towards the health portal was positive. The patients identified that they would use the technology if opened up for them at the urgent care clinic. Most of the patients are at the 12th grade level (57.3%). Forty-eight percent of the urgent care patients do not have another healthcare provider. The patients felt the health portal would be easy to use (81%) and would use the technology if opened up (71%). The majority of the patients felt they would use the health portal if opened up to them at the urgent care clinic (71%).

The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education. The patient education information for the top five chronic diseases of patients in the clinic were analyzed with the Patient Education Materials Assessment Tool (AHRQ, 2013), SMOG (McLaughlin, 1969), and Up to Date (Wolters Kuwler, 2016) to determine the benefits of education through the health portal. The assessment identified the educational material appropriate and up to date except for two educational tools which needed simplifying for readability.

Use of health portals is worldwide and continues to quickly grow in popularity. The use of health portals falls under the Meaningful Use requirement by the United States Government which may be mandated in the near future (Center for Medicare and Medicaid Services, 2010; U.S. Government, 2013). The QI DNP project goal was to provide leadership with information to help determine whether or not to open the health portal for staff and patients. By following through on the outcomes of the DNP project such as analyzing and synthesizing evidence-based literature, administering the revised TAM questionnaire to staff, and administering the revised TAM questionnaire to patients, the projects overall goals were met. All of the objectives were met in the project's timeline. Lastly, the executive summary was prepared and given to the system administrators with the results of both activities to promote the activation of the health portal at the urgent care clinic. The purpose of Section five is to discuss the executive summary, published abstract, societal implications, and summarizes the entire DNP QI project.

Section 5: Executive Summary

Introduction

The problem identified in the QI DNP project is that although the health portal has been available for the past six years, it has never been made available to staff and patients. A gap exists between the evidence and patient services provided by the urgent care clinic. The purpose of this QI DNP project was to assess staff and patients' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology. The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use of the health portal for patient education. The objectives of the DNP project were to evaluate current literature, collect data from the TAM questionnaire given to staff and patients, and provide an executive summary to administration. The educational patient education information was analyzed with the PEMAT-P (AHRQ, 2013), SMOG (McLaughlin, 1969), and Up to Date (Wolters Kuwler, 2016). Lastly, an executive summary was prepared for system administrators with the results of both activities to promote the activation of the health portal at the urgent care clinic.

The following is the Executive Summary that will be given to administration at the urgent care clinic to help justify opening the health portal for the staff and for patient's use. There is overwhelming evidence presented in this assessment to support the health portal use in the urgent care clinic setting.

Executive Summary

The goal

To activate the health portal at the urgent care clinic to allow staff and patients to utilize the benefits.

Problem

The problem identified in this QI DNP project was that the health portal has never been available to staff or patients. Access to the health portal could lead to better outcomes for the patient and help promote compliance with medical advice and unwarranted disease progression (Hussain, Naqvi, Ahmed, & Ali, 2015; Koonce, Giuse, Beauregard, & Giuse, 2007; Maez, Erickson, & Naumuk, 2014; Pinnock, & Thomas, 2015). Some urgent care patients (45%) who need a follow up visit do not go back to their primary doctor for re-evaluation (Hospital Case Management, 2015; Robeznieks, 2015). By utilizing the health portal, these patients will have a communication and access link to their health records. The patients will have access to appropriate education regarding the consequentiality of their conditions to facilitate the best possible health outcomes and self-management of the disease (van Os-Medendorp, et al., 2012).

Product

Docutap (2016) has a health portal application already embedded in the electronic health record which is included in the price of the program.

Potential Return

In the future EHR will be expanding and many requirements potentially could be initiated either by government backing or other funding. EHR health portals save time and money for staff by improving staff efficiency.

Assessment Data

The staff attitude towards the health portal was positive, with 75 % saying they would use the health portal if trained properly. The age of the patients at the urgent care center are between 30-39 (33%). Most of the patients are at the 12th grade level (57.3%). Forty-eight percent of the

urgent care patients do not have another healthcare provider. One fourth of these patients come to the clinic between 2-3 times per year. The patients felt the health portal would be easy to use (70%), beneficial to them (73%), and would use the technology if available (70%).

The review of the five top clinic diagnoses in the health portal was appropriate grade, literacy, readability, and actionability. The facts were checked with Up to Date (2016) evidence-based recommendations and were current. Only and two educational handouts need to be simplified for readability.

Competition

The use of the health portal is worldwide and continues to quickly grow in popularity. The use of health portals falls under the Meaningful Use requirement by the United States Government which may be mandated in the near future (Center for Medicare and Medicaid Services, 2010; U.S. Government, 2013).

Execution Plan

The plan would include adequate training for staff, sectional roll outs for certain aspects of the application (educating patients, messaging, refills, and labs) in progression, implementation of education for patients, and final launch of application with appropriate guidance as needed. Educational posters for all patient rooms and the entryway explaining the process can be obtained from Docutap (2015).

The Team

The team to lead the project would be your clinic manager in collaboration with the Docutap (2015) educator.

Social Influence

Using health portals is a worldwide phenomenon which has not spread to urgent care clinics as of yet. The plan is to promote the integration of the health portal into urgent care clinics after the executive summary is presented which will hopefully help increase awareness of the benefits of the health portal. Health portals promote quality care for all patients and are compensated by the U.S. Government in the Meaningful Use program. Also application of AACN (2006) Essentials by the DNP scholar helps to spread the use of informatics to leadership in practice. Submitting an abstract to conferences and ultimately submitting the DNP QI project for publication promotes key ways to disseminate the scholarly project and make a social change. I attempted to work with the American Association of Urgent Care Clinics to offer a lecture or poster presentation of my findings. The coordinator did not have open poster presentations at the conferences but plans to stay in contact for future presentation at a conference next year. A summary PowerPoint was developed to highlight the DNP QI project (Appendix I).

Project Summary

In summary, the health portal has many facets of benefits when used in practice. This project has identified the gap in services needed at the urgent care clinic to facilitate the patients' care. Since the health portal is currently embedded in their EHR and the only extra cost would be training, opening up the health portal has the potential to facilitate the urgent care clinic patients' care, possibly improving clinical outcomes, improving patient's involvement in their care, and the clinic staff's workload. The health portal is in addition to the clinics' every day function and is not designed to substitute the healthcare provider involvement but to enhance patient care. It is imperative that administration be the leaders in promoting the health portal to promote provider

acceptance and use in practice. This assessment has shown the benefits of health portals in the urgent care setting and the positive response from the majority of clinic patients. By promoting health portal functionality in this type of practice setting the administration would be leading the country in a new wave of patient-centered technology.

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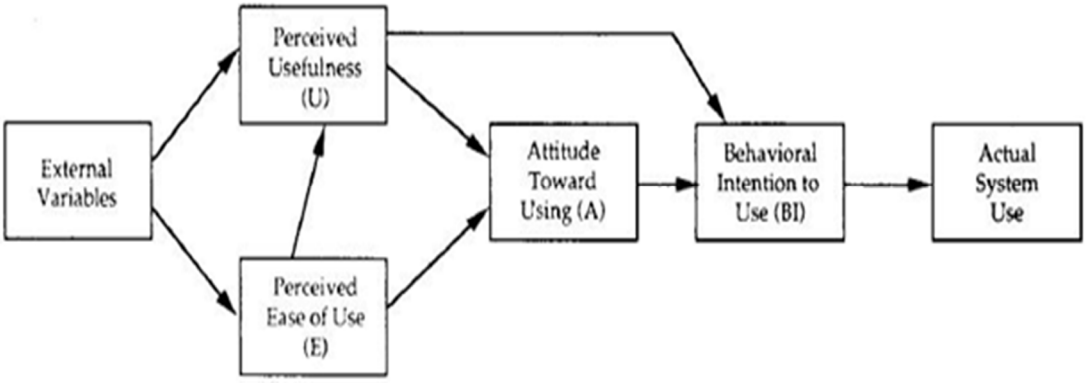
Appendices

Appendix A

Technology Acceptance Model



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Appendix B

Technology Acceptance Questionaire: Staff

HEALTH PORTAL QUESTIONNAIRE: STAFF (Davis, 1989)

Health Portal
A Health Portal is the use of computer technology available through the Urgent Care Clinic's web page that can allow the patients to be proactive in their health care and can facilitate communication with the patients.

Purpose
To evaluate the staff's acceptance of a new Health Portal Application that may potentially be found on the Urgent Care Clinic's web page and to identify the potential barriers that may exist for the adoption of the system as a useful tool. The Technology Acceptance Model (TAM) that was developed by Davis (1989) is used for an example. The TAM is a model based on the intention to use a new the technology and was created to explain and predict the acceptance of information and communication technologies by users. This model is a valid and reliable instrument. It encompasses the following dimensions: perceived usefulness, perceived ease of use, intention to use and the attitude of the user towards the new technology. The information

used below includes all the areas to be measured.

In this questionnaire, there are mixed the statements to prevent any bias answers.

As you answer the questionnaire, some of the questions will be similar on purpose.

Who can participate ?

This questionnaire aims to gather the information from staff at the Urgent Care Clinic.

1 - Sex: ☐ Female ☐ Male

2 - Age: <30 years ☐ 30-39 years ☐ 40-49 years ☐ 50-59 years ☐ > 60 years ☐

3- Highest grade obtained

☐ GED

☐ Diploma

☐ Bachelor

☐ Master degree

☐ PhD

4- Do you have a primary healthcare provider other than the Urgent Care Clinic?

☐ Yes ☐ No

5- Do you come to the Urgent Care Clinic often?

☐ Yes ☐ No

6- If yes how often do you come? (times per year)

☐ < 1 ☐ 2-3 ☐ 3-5 ☐ 5-10 ☐ > 10

Steps

1. Read the statements of the questionnaire presented below.
2. Rate each statement.
3. Complete the questionnaire.
4. Give the questionnaire to the researcher when complete.

Your opinion is important and will be analyzed confidentially. These statements relate to various factors that may be involved in the acceptance of using a health portal. Please select a single option for your level of agreement with each of the following statements using the scale provided below:

-3 Totally disagree	-2 Disagree	-1 Slightly disagree	0 Neither agree nor disagree	1 Slightly agree	2 Agree	**3 Totally agree**

1. I feel comfortable with information and communication technologies	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
2. I know what a Health Portal is and provides for my patients.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
3. I think that I could easily learn how to use Health Portal.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
4. I think it is a good idea to use the Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
5. I have the intention to fully use all of the Health Portal functions when it becomes available in the clinic.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
6. The use of the Health Portal could help me to monitor my patient's data quicker.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
7. The use of the Health Portal may improve the monitoring of the patients health status.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
8. I think it would be easy for patients to monitor health by using the Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
9. The use of the Health Portal will make my job	-3	-2	-1	0	1	2	3

easier.	☐ ☐ ☐ ☐ ☐ ☐ ☐
10. By using the communication tab in the Health Portal I will be able to communicate better with my patients.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
11. It will be easier for me to renew the patient's prescriptions using the Health Portal.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
12. The Health Portal will promote education for the patients by providing them with access to their health care diagnosis to make it easier for them to follow advice.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
13. The Health Portal will promote wellness by providing them with a list of their immunizations and vaccines.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
14. I find it interesting to use the Health Portal for patient care.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

-3 Totally agree	-2 Disagree	-1 Slightly disagree	0 Neither agree nor disagree	1 Slightly agree	2 Agree	**3 Totally agree**

15. I have the intention to facilitate the use of the Health Portal to provide information to other healthcare providers.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
16. I have already used a Health Portal to care for myself.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
17. The Health Portal can facilitate my patients care and make it better	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
18. The use of the Health Portal is beneficial for my patients care	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
19. I think I will find it easy to acquire the necessary skills to use the Health Portal at the clinic.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
20. I would use the Health Portal if I had some training.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
21. Other health professionals that I use would welcome the fact that I use the Health Portal	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
22. I feel that the Health Portal will be useful to improve my patient's health care and will be easy for them to use.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
23. I think that the Health Portal will be easy for me to use	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
24. In my opinion, the use of the Health Portal will have a positive impact on my patients health	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

care	
25. I would facilitate use the Health Portal for my patients if I have access to technical assistance	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
26. I often use computers in my work.	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

Thank you for your cooperation

Comments:

Public domain with reference.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13, 983-1003.

Appendix C

Technology Acceptance Questionaire: Patient

HEALTH PORTAL EVALUATION QUESTIONNAIRE: PATIENT (Davis, 1989)

Definition of a Health Portal
A Health Portal is the use of computer technology available through the Urgent Care Clinic's web page that can allow you to be proactive in your health care.

Purpose
To evaluate the patient's acceptance of a new Health Portal Application that may potentially be found on the Urgent Care Clinic's web page and to identify the potential barriers that may exist for the adoption of the system as a useful tool. The Technology Acceptance Model (TAM) that was developed by Davis (1989) is used for an example. The TAM is a model based on the intention to use a new the technology and was created to explain and predict the acceptance of information and communication technologies by users. This model is a valid and reliable instrument. It encompasses the following dimensions: perceived usefulness, perceived ease of use, intention to use and the attitude of the user towards the new technology. The information used below includes all the areas to

be measured. In this questionnaire, there are mixed the statements to prevent any bias answers. As you answer the questionnaire, some of the questions will be similar on purpose.

Who can participate ?

This questionnaire aims to gather the information from patients that use the Urgent Care Clinic for their healthcare.

1 - Sex: ☐ Female ☐ Male

2 - Age: <30 years ☐ 30-39 years ☐ 40-49 years ☐ 50-59 years ☐ > 60 years ☐

3- Highest grade obtained

☐ GED

☐ Diploma

☐ Bachelor

☐ Master degree

☐ PhD

4- Do you have a primary healthcare provider other than the Urgent Care Clinic?

☐ Yes ☐ No

5- Do you come to the Urgent Care Clinic often?

☐ Yes ☐ No

6- If yes how often do you come? (times per year)

☐ < 1 ☐ 2-3 ☐ 3-5 ☐ 5-10 ☐ > 10

Steps

1. Read the statements of the questionnaire presented below.
2. Rate each statement.
3. Complete the questionnaire.
4. Turn in the questionnaire to the admissions clerk when completed.

Your opinion is important and will be analyzed confidentially. These statements relate to various factors that may be involved in the acceptance of using a health portal. Please select a single option for your level of agreement with each of the following statements using the scale provided below:

-3 **Totally disagree**	-2 Disagree	-1 Slightly disagree	0 Neither agree nor disagree	1 Slightly agree	2 Agree	**3** **Totally agree**

1. I feel comfortable with information and communication technologies	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
2. The use of the Health Portal could help me to monitor my health care data quicker.	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
3. I think that I could easily learn how to use Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
4. I think it is a good idea to use the Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
5. I have the intention to use Health Portal when it becomes available in my clinic	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
6. The use of the Health Portal may cause major changes in my health behavior	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
7. The use of the Health Portal may improve the monitoring of my health status	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
8. I think it would be easy to monitor my health by using the Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
9. I will welcome the use of the Health Portal	-3	-2	-1	0	1	2	3

	☐	☐	☐	☐	☐	☐	☐
10. I have access to the necessary infrastructure to support my use of the Health Portal	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
11. Using the Health Portal could help me get the most out of healthcare services by using it	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
12. I believe that the website in the Health Portal would be clear and easy to understand	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
13. I think that the Health Portal is flexible technology that is easy to interact with	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
14. I find it interesting to use the Health Portal for my medical information and care	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐

-3 **Totally agree**	-2 Disagree	-1 Slightly disagree	0 Neither agree nor disagree	1 Slightly agree	2 Agree	**3** **Totally agree**

15. I have the intention to use the Health Portal when necessary to provide information to other healthcare providers	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
16. I have already used a Health Portal to care for myself	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
17. The Health Portal can facilitate my care and make it better	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
18. The use of the Health Portal is beneficial for my care	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
19. I think I will find it easy to acquire the necessary skills to use the Health Portal	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
20. I would use the Health Portal if I had some training	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
21. Other health professionals that I use would welcome the fact that I use the Health Portal	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
22. I feel that the Health Portal will be useful to improve my health care	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
23. I have the intention to use the Health Portal on a regular basis	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
24. Using the Health Portal will stop me from using another provider to follow up with	-3 -2 -1 0 1 2 3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
25. I think that the Health Portal will be easy to use	-3 -2 -1 0 1 2 3

	☐	☐	☐	☐	☐	☐	☐
26. In my opinion, the use of the Health Portal will have a positive impact on my health care	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
27. I would use the Health Portal if I have access to technical assistance	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐
28. I often use computers in my work	-3 ☐	-2 ☐	-1 ☐	0 ☐	1 ☐	2 ☐	3 ☐

Thank you for your cooperation

Comments:

Public domain with reference.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13, 983-1003.

Appendix D

Patient Education Materials Assessment Tool for Printable Materials

There are seven steps to using the PEMAT to assess a patient education material. The instructions below assume that you will score the PEMAT using paper and pen. If you use the PEMAT Auto-Scoring Form, a form that will automatically calculate PEMAT scores once you enter your ratings, you can skip Step 5. The form is available at: http://www.ahrq.gov/professionals/prevention-chronic-care/improve/self-mgmt/pemat/pemat_form.xls. (Note: To use the PEMAT Auto-Scoring Form, you may need to enable macros or content if prompted.) If you use the PEMAT to rate the understandability and actionability of many materials, you may get a sense of what score indicates exceptionally good or exceptionally poor materials .

Step 1: Read through the PEMAT and User's Guide. Before using the PEMAT, read through the entire User's Guide and instrument to familiarize yourself with all the items. In the User's Guide a (P) and (A/V) are listed after an item to indicate whether it is relevant to print and audiovisual materials, respectively.

Step 2: Read or view patient education material. Read through or view the patient education material that you are rating in its entirety.

Step 3: Decide which PEMAT to use. Choose the PEMAT-P for printable materials or the PEMAT-A/V for audiovisual materials.

Step 4: Go through each PEMAT-P item one by one. All items will have the response options "Disagree" or "Agree." Some—but not all—items will also have a "Not Applicable" answer option. Go one by one through each of the items, 24 for printable materials and 17 for audiovisual materials, and indicate if you agree or disagree that the material meets a specific criterion. Or, when appropriate, select the “Not Applicable” option.

You may refer to the material at any time while you complete the form; you don't have to rely on your memory. Consider each item from a patient perspective. For example, for "Item 1: The material makes its purpose completely evident," ask yourself, "If I were a patient unfamiliar with the subject, would I readily know what the purpose of the material was?"

Step 5: Rate the material on each item as you go. After you determine the rating you would give the material on a specific item, enter the number (or N/A) that corresponds with your answer in the "Rating" column of the PEMAT-P. Do not score an item as "Not Applicable" unless there is a "Not Applicable" option. Score the material on each item as follows:

If Disagree……..Enter 0

If Agree……..Enter 1

If Not Applicable……Enter NA

Additional Guidance for Rating the Material on Each Item (Step 5)

Rate an item "Agree" when a characteristic occurs throughout a material, that is, nearly all of the time (80% to 100%). Your guiding principle is that if there are obvious examples or times when a characteristic could have been met or could have been better met, then the item should be rated "Disagree." The User's Guide provides additional guidance for rating each item.

Do not skip any items. If there is no "Not Applicable" option, you must score the item 0 (Disagree) or 1 (Agree).

Do not use any knowledge you have about the subject before you read or view the patient education material. Base your ratings ONLY on what is in the material that you are rating.

Do not let your rating of one item influence your rating of other items. Be careful to rate each item separately and distinctly from how you rated other items.

If you are rating more than one material, focus only on the material that you are reviewing and do not try to compare it to the previous material that you looked at.

Step 6: Calculate the material's scores. The PEMAT-P provides two scores for each material—one for understandability and a separate score for actionability. Make sure you have rated the material on every item, including indicating which items are Not

Applicable (N/A). Except for Not Applicable (N/A) items, you will have given each item either 1 point (Agree), or 0 points (Disagree). To score the material, do the following:
Sum the total points for the material on the understandability items only.
Divide the sum by the total possible points, that is, the number of items on which the material was rated, excluding the items that were scored Not Applicable (N/A).
Multiply the result by 100 and you will get a percentage (%). This percentage score is the understandability score on the PEMAT-P.

Example: If a print material was rated Agree (1 point) on 12 understandability items, Disagree (0 points) on 3 understandability items, and N/A on one understandability item (N/A), the sum would be 12 points out of 15 total possible points (12 + 3, excluding the N/A item). The PEMAT-P understandability score is 0.8 (12 divided by 15) multiplied by 100 = 80%.

To score the material on actionability, repeat Step 6 for the actionability items.

Step 7: Interpret the PEMAT-P scores. The higher the score, the more understandable or actionable the material. For example, a material that receives an understandability score of 90% is more understandable than a material that receives an understandability score of 60%, and the same goes for actionability.

PEMAT for Printable Materials (PEMAT-P)

Understandability

Item #	Item	Response Options	Rating
Topic: **Content**			
1	The material makes its purpose completely evident.	Disagree=0, Agree=1	
2	The material does not include information or content that distracts from its purpose.	Disagree=0, Agree=1	
Topic: **Word Choice & Style**			
3	The material uses common, everyday language.	Disagree=0, Agree=1	
4	Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined.	Disagree=0, Agree=1	
5	The material uses the active voice.	Disagree=0, Agree=1	
Topic: **Use of Numbers**			
6	Numbers appearing in the material are clear and easy to understand.	Disagree=0, Agree=1, No numbers=N/A	
7	The material does not expect the user to perform calculations.	Disagree=0, Agree=1	
Topic: **Organization**			
8	The material breaks or "chunks" information into short sections.	Disagree=0, Agree=1, Very short material[i]=N/A	
9	The material's sections have informative headers.	Disagree=0, Agree=1, Very short material[i]=N/A	
10	The material presents information in a logical sequence.	Disagree=0, Agree=1	

11	The material provides a summary.	Disagree=0, Agree=1, Very short material[i]=N/A	
Topic: **Layout & Design**			
12	The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points.	Disagree=0, Agree=1, Video=N/A	
Topic: **Use of Visual Aids**			
15	The material uses visual aids whenever they could make content more easily understood (e.g., illustration of healthy portion size).	Disagree=0, Agree=1	
16	The material's visual aids reinforce rather than distract from the content.	Disagree=0, Agree=1, No visual aids=N/A	
17	The material's visual aids have clear titles or captions.	Disagree=0, Agree=1, No visual aids=N/A	
18	The material uses illustrations and photographs that are clear and uncluttered.	Disagree=0, Agree=1, No visual aids=N/A	
19	The material uses simple tables with short and clear row and column headings.	Disagree=0, Agree=1, No tables=N/A	

***Total Points*: _____**

***Total Possible Points*: _____**

Understandability Score (%): _____

(Total Points / Total Possible Points x 100)

Actionability

Item #	Item	Response Options	Rating
20	The material clearly identifies at least one action the user can take.	Disagree=0, Agree=1	
21	The material addresses the user directly when describing actions.	Disagree=0, Agree=1	
22	The material breaks down any action into manageable, explicit steps.	Disagree=0, Agree=1	
23	The material provides a tangible tool (e.g., menu planners, checklists) whenever it could help the user take action.	Disagree=0, Agree=1	
24	The material provides simple instructions or examples of how to perform calculations.	Disagree=0, Agree=1, No calculations=NA	
25	The material explains how to use the charts, graphs, tables, or diagrams to take actions.	Disagree=0, Agree=1, No charts, graphs, tables, or diagrams=N/A	
26	The material uses visual aids whenever they could make it easier to act on the instructions.	Disagree=0, Agree=1	

***Total Points*: _____**

***Total Possible Points*: _____**

Actionability Score (%): _____

(Total Points / Total Possible Points x 100)

Public domain with reference

Agency for Healthcare Research and Quality [AHRQ] (2013). *PEMAT for Printable Materials (PEMAT-P).* Rockville, MD. Retrieved from http://www.ahrq.gov/professionals/prevention-chronic-care/improve/self-mgmt/pemat/pemat-p.html

Shoemaker, S.J., Wolf, M.S., & Brach, C. (2013). The patient education materials assessment tool (PEMAT) and user's guide. *Abt Associates, Inc. under Contract No. HHSA2902009000121, TO 4*. Rockville, MD: Agency for Healthcare Quality: November 2013. AHRQ Publication No.14-0002-EF. Retrieved from http://www.ahrq.gov/sites/default/files/publications/files/pemat_guide.pdf

Appendix E

Simple Measures Of Gobbledygook

The SMOG Readability Formula

Step 1: Take the entire text to be assessed.

Step 2: Count 10 sentences in a row near the beginning, 10 in the middle, and 10 in the end for a total of 30 sentences.

Step 3: Count every word with three or more syllables in each group of sentences, even if the same word appears more than once.

Step 4: Calculate the square root of the number arrived at in Step 3 and round it off to nearest 10.

Step 4: Add 3 to the figure arrived at in Step 4 to know the SMOG Grade, i.e., the reading grade that a person must have reached if he is to understand fully the text assessed.

SMOG grade = 3 + Square Root of Polysyllable Count

The SMOG Formula is considered appropriate for secondary age (4th grade to college level) readers.

The premises of McLaughlin's SMOG Formula are:

1. A sentence is defined as a string of words punctuated with a period, an exclamation mark, or a question mark.

2. Consider long sentences with a semi-colon as two sentences.

3. Words with hyphen are considered as a single word.

4. Proper nouns, if polysyllabic should be counted.

5. Numbers that are written should be counted. If written in numeric form, they should be

pronounced to determine if they are polysyllabic.

6. Abbreviations should be read as though unabbreviated to determine if they are polysyllabic. However, abbreviations should be avoided unless commonly known.

7. If the text being graded is shorter than 30 sentences, follow the steps below:

i. Count all the polysyllabic words in the text

ii. Count the number of sentences in the text.

iii. Divide the figures obtained in i by the figure obtained in ii to arrive at Average Polysyllabic Words per sentence.

iv. Multiply the figure obtained in iii with the average number of sentences short of 30.

v. Add the figure obtained in iv to the total number of polysyllabic words.

vi. Compare the number of polysyllabic words in the SMOG Conversion Table.

SMOG Conversion Table	
Total Polysyllabic Word Count	**Approximate Grade Level (+1.5 Grades)**
1 – 6	5
7 – 12	6
13 – 20	7
21 – 30	8
31 – 42	9

43 – 56	10
57 – 72	11
73 – 90	12
91 – 110	13
111 – 132	14
133 – 156	15
157 – 182	16
183 – 210	17
211 – 240	18

Public domain with reference

McLaughlin, G. H. (1969). SMOG grading: A new readability formula. *Journal of Reading, 12* (8), 639-646. Retrieved from http://webpages.charter.net/ghal/SMOG_Readability_Formula_G._Harry_McLaughlin_(1969).pdf

Appendix F

Gantt Chart for Health Portal Project Timeline (2015)

Term Plan Fall 2016

Anita Joyce Simmons

	Week	Current Status	Goal This Week	Comp	Comments
1	Sept. 8 - Sept.13	Proposal Draft	Correct errors	#1	Moon
2	Sept. 14 - Sept. 20	Proposal Draft	Turn In	#2	
3	Sept. 21 - Sept. 27	Submit Approved Draft in MyDR	Submit draft not approved	#2	
4	Sept. 28 - Oct. 4	Work on Step 2	Work on final drafts of paper	#2	
5	Oct. 5-Oct. 11	Step 2	Work on final drafts	#3	Hayden
6	Oct. 11- Oct. 18	Step 2	Work on final drafts	#3	
7	Oct. 19 - Oct. 25	Step 2	Work on final drafts	#3	
8	Oct. 26 - Nov. 1	Step 2	Work on final draft	#3	
9	Nov. 2 - Nov. 8	Step 2	Work on final draft	#3	
10	Nov. 9 - Nov. 15	Step 2	Work on final draft	#3	Hayden
11	Nov. 16- Nov. 22	Step 2	Work on final draft	#3	
12	Nov. 21- Nov.28	Step 2	Work on final draft	#3	
1	Nov. 29- Dec. 5	Step 2	Work on final draft	#3	
2	Dec.6-Dec.12	Step 2	Work on final draft	#3	
3	Dec.13-Dec.19	Step 2	Work on final draft	#3	

4	Dec.20-Dec.26	Step 2	Work on final draft	#3	
5	Dec.27-Jan 2	Step 2	Work on final draft	#3	
6	Jan. 3-Jan.9	Step 2	Work on final draft	#3	
7	Jan. 10-Jan.16	Step 2	Work on final draft	#3	
8	Jan.17-Jan.23	Step 2	Work on final draft	#3	
9	Jan. 24- Jan.30	Step 2	Work on final draft	#3	
10	Jan. 31- Feb. 6	Step 2	Finalize draft	#3	
11	Feb. 7-Feb 13	Step 3	Finalize draft for MyDR	#4	
12	Feb 14- Feb 20	Step 3	Finalize draft	#4	
13	Feb 21- Feb 27	Step 3	Finalize draft	#4	
14	Feb 28- Mar 5	Step 3	Finalize draft	#4	
15	Mar 6- Mar 12	Step 3	Finalize draft	#4	
16	Mar 13- Mar 19	Step 3	Finalize draft	#4	
17	Mar 20- Mar 26	Step 3	Finalize draft for MyDR	#4	
18	Mar 27- Apr 2	Step 3	Approval in MyDR site	#4	
19	Apr 3 – Apr 9	Step 3	Approval in MyDR site	#4	
20	Apr 10- Apr 16	Step 3	Approval in MyDR site	#4	
21	Apr 17- May 15	Step 3	Approval in MyDR site	#4	April 18 revision accepted and put back into MyDR
22	May 15-21	Step 3	Oral Defense and Approval in MyDR	#4	Powerpoint completed: Oral defense approved
23	May 22-28	Step 4	IRB Process	#5	Received Form A acknowledgement
24	May 29- June 4	Step 4	IRB Process	#5	

25	June 5-11	Step 4	IRB Process and approval	#5	
26	June 12-18	Step 4	IRB Waiting	#5	
27	June 19-25	Step 4		#5	
28	June 26- July 2	Step 4	IRB Waiting	#5	
29	July 3-9	Step 4	IRB Approval	#5	Approval
30	July 10-16	Step 4	Data Gathering	#5	Done
31	July 17-23	Step 4	Data analysis Sections 4 and 5 started	#5	
32	July 24- 30	Step 4	Sections 4-5 draft done	#5	
33	July 31- Aug 6	Step 5	Revision	#5	Moon for review
34	Aug 7- Aug 13	Step 5	Revision	#5	
35	Aug 14- Aug 20	Step 5	Revision	#5	Moon with edits
36	Aug 21-27	Step 5	Revision	#5	
37	Aug 28- Sept 3	Step 5	Revision	#5	
38	Sept 4-10	Step 5	Hayden Review	#5	MyDR site
39	Sept 11-17	Step 5	Hayden Revision	#5	
40	Sept 18-24	Step 5	Revision	#5	
41	Sept 25 – Oct 1	Step 5	URR	#5	Form and Style
42	Oct 2-8	Step 5	Revision	#5	
43	Oct 9-15	Step 5	Form and Style	#5	
44	Oct 16-22	Step 5	Revision	#5	Form and Style/Hayden edits Final Oral Defense 10/22

45	Oct 23-29	Step 5	Revision	#5	
46	Oct 30- Nov 5	Step 5	Final Oral Defense	#5	Revision CAO
47	Nov 6 - 12	Step 6	CAO Revision	#6	
48	Nov 13-19	Step 6	Project completion	#6	CAO Approval Upload to ProQuest

Appendix G

Letter of Cooperation

Date: 6/29/2016

Dear Anita Joyce Simmons,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Health Portal Functionality: Use of Patient-Centered Technology within the Sherwood Urgent Care Clinic. As part of this study, I authorize you to give out the questionnaires to the staff and to our patients and to report those results back to us and you may disseminate them in your project. Individuals' participation will be voluntary and at their own discretion. The staff is allowed to complete the questionnaire during working hours.

We understand that our organization's responsibilities include: handing out the questionnaires at the admission desk window, and the participants will be placing them in the secure box provided. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research assessment collecting in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Lori Stark, R.N.

Authorization Official

Contact Information

Walden University (2016). *Research ethics and compliance*. Retrieved from http://academicguides.waldenu.edu/researchcenter/orec/documents

Appendix H

Simmons IHI Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that Anita Simmons successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 01/10/2015

Certification Number: 1644610

Appendix I

Powerpoint presentation

- Health Portal Functionality

  Use of Patient-Centered Care Technology
- Anita Joyce Simmons APRN, CNS
- Walden University A00542906
- Final Oral Defense
- October 2016
-
- Dr. Joan Moon – Committee Chair
- Dr. Susan Hayden – Committee Member
- Dr. Patricia Schweickert – Committee URR
- Introduction
- American Association of Colleges of Nursing (AACN, 2006)
    - Essential II
        - Organizational Systems
    - Essential IV
        - Informatics
- Electronic Health Record (EHR)
    - Health portal within EHR
- Introduction, cont.
- Health Portals
- Dedicated web pages for medical practices to provide to patients

    - Access via cell phone, tablets, computers
    - Access to medical records
    - Communication with providers
    - Obtain evidence-based education about diagnosis and treatment (United States Government [US], 2011)
- Improve care (US, Office of the National Coordinator, 2011)
- Federal resources commitment
    - Incentive programs to monetarily reward providers
    - Meaningful use of certified electronic health records

- Introduction, cont.
- Meaningful Use
    - Stage 1 is focused on electronic data capture and sharing (U.S. Government, 2015).
    - Stage 2 concentrates on advancing the clinical electronic record processes.
        - Includes 14 core objectives and 10 eligible professional menu objectives
        - Patient-specific resources and data tracking capabilities
    - Stage 3 works towards improving outcomes of those who use the electronic health records (CMS, 2010).
- Introduction, cont.
- Urgent care clinic in the mid-south
    - Part of a larger organization of urgent care clinics

    - Open 7 days a week
    - 25,000 visits a year
    - Rural area
    - Underserved
    - Often used for primary care services
- EHR for six years – a new system put in place October 2016
- Staff concerns about wanting the health portal but not knowing how to provide the portal to patients
- Administration has not made the portal a priority
    - Background

Health Information Technology

- Broad concept- data that is stored, shared, and analyzed
- Several platforms- including the health portal
- Communication and be proactive
- Access information from any electronic device any time

Health Portal – Clinic Perspective

- Keep trending data
- Communication with patients
- Supportive care between visits
- Improve patient outcomes
- Offer appropriate education
    - Low literacy, reliable, and valid
- Problem Statement

The problem identified in this QI DNP project was that although the EHR has been in the facility for the past six years, the health portal has never been made available to staff and patients.

- Purpose

  The purpose of this QI DNP project was to assess staff and patients ' perceived usefulness, perceived ease of use, intention to use the health portal, and their attitude towards the technology.

  The second purpose of the project was to determine appropriateness of the patient education on the portal to determine whether to support the use for patient education.

- Research Questions
- What were the attitudes of staff and patients toward using the health portal?
- Did staff and patients perceive the portal as useful and easy to use?
- Did the review of the five top clinic diagnoses education in the health portal be supported by the evidence and meet readability guidelines?
- Goal

  The QI DNP project goal was to provide leadership with information to help determine whether or not to open the health portal for staff and patients.

- Outcomes

  1. Analysis and synthesis of current literature for leadership

  2. Revised Technology Acceptance Model (Davis, 1989) questionnaire administered to staff

  3. Revised TAM questionnaire (Davis, 1989) administered to patients

4. Patient education analyzed with the

Patient Education Materials Assessment Tool (AHRQ,

2013)

5. Executive summary for system administrators

- Framework
- Technology Acceptance Model (TAM)
- TAM (Davis, 1989) includes the following dimensions:
    - perceived usefulness
    - perceived ease of use
    - intention to use electronics
    - attitude of the new user towards the technology
    - Significance
- American Nurses Association (ANA, 2013) supports EHR use and access.
- Using portal can lead to better outcomes and compliance (Maez et al., 2014; Pinnock, & Thomas, 2015).
- EHR can aid with streamlined charting for staff.
- Health portals can encourage patients to be better informed about their health (Hussain et al., 2015; Koonce et al., 2007; Maez et al., 2014; Pinnock & Thomas, 2015).
- Health portals can potentially increase disease self management (Edmunds et al., 2014; Fioretti et al., 2015; Sharma, et al., 2014).
- Approach and Methods

- Review, analysis, and synthesis of literature using the John Hopkins (Newhouse et al, 2016) grading scale, and Walden literature matrix
- Technology Acceptance Model Questionnaire (Davis, 1989)
    - Staff – 8/11
    - Patients – 75 convenience sample
- Assessment of educational materials- top five diagnoses
    - Patient Educational Material Assessment Tool (AHRQ, 2013)
    - Simple Measures Of Gobbledygook (McLaughlin, 1969)
    - Up to Date (Wolters Kuwler, 2016)
- Outcome 1- Literature Review
- Discussion
    - I reviewed the evidence-based literature
    - Present data to leadership in executive summary
- Evaluation
    - Analysis and synthesis of evidenced-based literature- 76 articles
    - Educational materials assessment tools, analysis ,and synthesis
        - PEMAT-P (AHRQ,2013)- understandability 70% actionability %
        - SMOG (McLaughlin, 1969)- Two pamphlets reading levels lowered
        - Up to Date (Wolters Kuwler, 2016)
    - Literature matrix
    -

      Outcome 2-TAM Questionnaire - Staff

- Discussion
    - Technology Acceptance Model (Davis, 1989)
        - Benefits- facilitate communication, increase follow up visits, and foster patient-centered care
    - Revised TAM questionnaire (Davis, 1989) administered to 8 staff members in clinic meeting
    - Health portal education and training
- Evaluation
    - Only descriptive statistics used
- Data
        - Section I (7 pt Likert scale)
            - Staff agree (62%) with perceived use of the health portal
            - 3 of 8 of the staff had never used a portal or knew what it was
            - Staff perceived ease of use (72%)
    - Outcome 2- cont.
        - Section II
            - Attitude towards use (71%)
            - 50% felt like the health portal would be useful , improve their patients' health, and was easy to use
            - Intention to use the portal (54%)
            - 75% said they would use if trained properly
- Recommendation

- Education and training to promote use of EHR health portal
- Questionnaire to include questions about a person's past experience with technology

- Outcome 3-TAM Questionnaire - Patients
- Discussion
  - Average patients per day 70 random sample of 75
  - Questionnaires passed out at clerk window
- Evaluation
  - Only descriptive statistics used
- Data
    - 43 (57.33%) patients were at diploma 12th grade level
    - 36 (48%) patients did not have another HCP
    - Section I
      - Patients' perceived use of health portal agreement (60%)
      - 26 % of patients' knew what the health portal was and used one
      - Patients ease of use (70%)
      - 39 % of patients' had the intention to use the health portal regularly
  - Outcome 3- cont.
  - Section II
      - Patients' attitude towards technology (73%)

        - 56% of patients would follow up with HCP with no health portal
        - Patients' intention to use health portals (70%)
        - 81% felt the portal was easy to use
        - 77% was beneficial
        - 70% use technology if opened up
- Recommendation
    - Patients need access to their health records and educational materials
    - Questionnaire to include questions about a person's past experience with technology
-

Outcome 4 - Patient Education Patient Education Materials Assessment Tool (AHRQ, 2013)

- Discussion
    - EBP tools utilized
    - Top five common diagnoses
- Evaluation
    - PEMAT-P(AHRQ, 2013)
    - SMOG (McLaughlin, 1969)
    - Up to Date (Wolter Kuwler, 2016).
- Data
    - PEMAT-P= 70% understandable, 40-100% actionability (authors terminology)

    - SMOG = 5th to above 12th grade
    - Up to Date = current, applicable, EBP
- Recommendation
    - Change two handouts to a lower reading level
    -

      Outcome 5–Executive Summary
    - Key points to discuss with administration
        - Increases knowledge of health portal benefits
        - Promotes positive patient outcomes
        - Increases workflow
    - Derived from the staff and patient TAM questionnaire outcomes
- Implications
- Policy
    - Meaningful use incentives and requirements(U.S. Government, 2014)
    - Staff wanted clinic EHR policy and education on health portal use to streamline clinic tasks
- Practice
    - Improve communication between patient and staff
    - Health portal functionality decreases workflow for staff
- Research
    - Larger studies to promote use
    - Before and after

    - Patient-centered technology promotes self-management of and ownership of care
    - Social Change
- Promote quality care and self-management for all patients
- Foster Meaningful use rules and compensation
- Application of AACN (2006) Essentials to apply information in practice
- Analysis of Self
- Scholar
    - Scientific foundation AACN Essentials (2006)
    - Process of research and scholarly review of the literature
    - Scholarly writing
- Practitioner
    - Focus on patient-centered care, informatics, and education
    - Quality outcomes - Office of the National Coordinator(U.S. Department of Health and Human Services, 2011) and Center for Medicare and Medicaid Services (U.S. Government, 2014b)
    - Financial rewards- Meaningful use
- Project Manager
    - Meaningful use knowledge
    - Evaluation of providers using EHR
    - Research process- organization, Walden IRB, and data collection
- Professional Development
    - Growth professionally

- Leadership
- Dissemination
- American Association of Urgent Care Clinics
    - Oral Presentation (if accepted)
    - Roundtable discussion with Docutap Representative (asked to join their blog after graduation)
        - April 30-May 3, 2017 National Harbor, Maryland
- University of Hawaii
    - Oral Presentation (accepted)
        - January 13-14, 2017 Honolulu, Hawaii
- 24th National Evidence-Based Practice Conference
    - Oral Presentation (if accepted)
        - April 27-28, 2017 Coralville, Iowa

Appendix J

TAM Staff and Patient Open Responses/Comments

TAM Questionnaire Staff Open Comments

1. Too much information could harm the patient.

2. Computers can and will fail.

3. Technology is only as good as the operators.

4. If patients are not trained to use properly it could cause more problems than help.

5. Really don't know what health portal is.

TAM Questionnaire Patient Open Comments

1. I use the health portal with three other doctors.

2. The portal may be most beneficial for patients managing chronic disease or requiring labs often. I don't fit these so don't see the value yet.

3. Thank you for the opportunity to take this survey.

4. I use the VA and don't use electronics.

5. Not sure what the health portal is.

6. I don't truly understand the healthcare portal, that's why so many answers are neither agree or disagree. But I would love and try it out.

7. This survey appears to ask four or five questions over again but worded differently.

8. I don't have a computer or a smart phone.

9. I have never heard of it being out there. So it would be helpful to explain what it is and what it does for them.

10. I am old school and like to keep things as simple as possible.

11. All this is great but getting a prescription refilled is a nightmare at this clinic. The fax is always broken for the last 15 years or there is no one to do the work. Get with it Sherwood.

12. Important that a health portal be user friendly.

13. Our other provider has a portal its very useful. We have only used Sherwood for two urgency cares.

14. Haven't used a portal for that clinic.

15. I think this would help if you should ever need a print out of your healthcare. Especially if going out of town.

16. I would never do any medical care or records via internet or computer. There is NO such thing as a secure computer, transmission, or network.

Appendix K

Literature Review Matrix

			Analysis of Literature-Matrix		
Full Reference	Method	Question	Analysis & Results	Conclusions	Implications for practice
Abbott, K. C., Boocks, C. E., Sun, Z., Boal, T. R., & Poropatich, R. K. (2003). Walter Reed Army Medical Center's Internet-based electronic health portal. Military	Research Multiphased retrospective analysis	At Walter Reed Army Medical Center, "Search & Learn" medical information, Internet-based prescription refills and patient appointments were established in January 2001. A multiphase retrospective analysis was conducted to determine the use of the "Search & Learn" medical information and the relative number of prescription refills and appointments conducted via the WWW compared with conventional methods.	RESULTS: From January 2001 to May 2002, there were 34,741 refills and 819 appointments made over the Internet compared with 2,275,112 refills and approximately 500,000 appointments made conventionally. WWW activity accounted for 1.52% of refills and 0.16% of appointments. There was a steady increase in this percentage over the time of the analysis. In April of 2002, the monthly average of online refills had risen to 4.57% and online appointments were at 0.27%. Online refills were projected to account for 10% of all prescriptions in 2 years.	The "Search & Learn" medical information portion of our web site received 147,429 unique visits during this same time frame, which was an average of 326 visitors per day.	Since computer integration into healthcare watching increase in patient use over the years.

Medicine, 168(12), 986-991.					
Aberger, E. W., Migliozzi, D., Follick, M. J., Malick, T., & Ahern, D. K. (2014). Enhancing patient engagement and blood pressure management for renal transplant recipients via home electronic	Research	Hypertension is optimally managed in only 37% of people with chronic kidney disease, and poor control can contribute to premature graft loss in renal transplant recipients. This article describes a telehealth system that incorporates home electronic blood pressure (BP) monitoring and uploading to a patient portal coupled with a Web-based dashboard that enables clinical pharmacist collaborative care in a renal transplant clinic. Materials and Methods: The telehealth system was developed and implemented as a quality	Results: Preliminary results show statistically significant reductions in average systolic and diastolic BP of 6.0 mm Hg and 3.0 mm Hg, respectively, at 30 days after enrollment. Two case reports describe the instrumental role of home BP monitoring in the context of medication therapy management.	Conclusions: Optimizing BP control for both pre- and post-renal transplant patients is likely to benefit society in terms of preserving scarce resources and reducing healthcare costs due to premature graft failure. Connected health systems hold great promise for supporting team-based care and improved health outcomes.	Hypertension controlled with health portal

monitoring and web-enabled collaborative care. Telemedicine Journal And E-Health: The Official Journal of the American Telemedicine Association, 20(9), 850-854. doi:10.1089/tmj.2013.0317		improvement initiative in a renal transplant clinic in a large, 700-bed, urban hospital with the aim of improving BP in posttransplant patients. A convenience sample of 66 posttransplant patients was recruited by the clinical pharmacist from consecutive referrals to the Transplant Clinic.			
Abramson, E. L., Kern, L. M.,	Research Pa	Adverse events (AEs) among hospitalized patients occur frequently and	Results From our panel discussion, experts identified six AEs as 'definitely reduced by health IT': (1) adverse	Conclusions Understanding the effects of	The use of information technol

Brenner, S., Hufstader, M., Patel, V., & Kaushal, R. (2014). Expert panel evaluation of health information technology effects on adverse events. Journal of Evaluation in Clinical Practice, 20(4), 375-382. doi:10.1111/jep.12139	nel	result in significant sequelae. Federal policy is incentivizing health information technology (HIT) use, although research demonstrating safety benefits from HIT is mixed. Our objective was to evaluate the potential effects of HIT on reducing 21 different inpatient AEs. Identifying AEs most likely to be reduced by HIT can inform the design of future studies evaluating its effectiveness. Methods We conducted a modified Delphi panel of national experts in HIT and safety. We conducted a focused literature review to inform the experts. Using a novel framework, experts rated	drug events (ADEs) associated with digoxin; (2) ADE associated with IV heparin; (3) ADE associated with hypoglycaemic agents; (4) ADE associated with low molecular weight heparin and factor Xa inhibitor; (5) contrast nephropathy associated with catheter angiography; and (6) ADE hospital-acquired antibiotic-associated Clostridium difficile.	HIT on patient outcomes will be essential to ensuring that the significant federal investment results in anticipated improvements.	ogy helps to reduce adverse events.

		each AE as 'definitely reduced by health IT,' 'possibly reduced by health IT' and 'not likely to be reduced by health IT'.			
Al-Zahrani, J. M., Ahmad, A., Al-Harbi, A., Khan, A. M., Al-Bader, B., Baharoon, S., … Al-Jahdali, H. (2015). Factors associated with poor asthma control in the outpat	Quantitative Research	To identify factors associated with poor asthma control in an outpt setting. Four hundred asthmatic patients (n = 400) were enrolled, and 70% of these patients were women. Fifty-four percent of patients inappropriately used the inhaler device.	The estimated prevalence of uncontrolled asthma at the time of the study was 39.8%. Inappropriate device use by the patient was more frequently associated with uncontrolled asthma (P-value = 0.001). Active smoking (P-value = 0.007), passive smoking (P-value = 0.019), unsealed mattress (P-value = 0.030), and workplace triggers (P-value = 0.036) were also associated with uncontrolled asthma. However, the extent of asthma control did not appear to be related to the existence of regular follow-ups, bedroom carpets, outpatient clinic visits, age, body mass index (BMI), or duration of asthma.	Conclusions: The present study identified a high prevalence of uncontrolled asthma in the primary outpatient clinic setting and common risk factors that may contribute to poor asthma control included education and asthma plan.	Education needed for asthma control

ient clinic settin g. Annal s of Thora cic Medic ine, 10(2), 100-104. Retrie ved from http:// www. thorac icmed icine. org/te xt.asp ?2015 /10/2/ 100/1 52450					
Alza man, N., Warta k, S. A., Frider ici, J., & Rothb erg, M. B. (2013). Effect of patien ts'	Q ua nti tat iv e Re se ar ch	Does awareness of CVD risk factors make a difference in their health. We surveyed patients 40 years and older at five ambulatory clinics. The survey measured demographics, health management behaviors, comorbidities,	Results: For five modifiable risk factors, awareness was positively associated with healthy behavior in multivariable models: obesity, hypertension, exercise, cholesterol, and diabetes. Awareness was inversely associated with smoking abstention.	Conclusion s: Awareness that a specific factor increases the risk for cardiovasc ular disease was positively associated with healthy behavior regarding	Being aware and cogniza nt of illness can help the patient to be motivat ed to do things that increase d their cardiac health.

awareness of CVD risk factors on health-related behaviors. Southern Medical Journal, 106(11), 606-609. doi:10.1097/SMJ.0000000000001 3		and awareness of five modifiable cardiac risk factors (smoking, obesity, high cholesterol, hypertension and diabetes mellitus) and one protective factor (exercise). Healthy behavior was defined as follows: diabetes, hemoglobin A1c <8.0%; hypertension, systolic blood pressure <140 mm Hg), high cholesterol, medication adherence; obesity, attempting to lose weight; smoking, abstinence; and exercise, ≥ 30 minutes/day, ≥ 3 times per week.		most risk factors; however, the association was modest, suggesting that awareness alone does not motivate behavior.	
Apter, A.J. (2014). Can patient portal	Research	Can patient portals reduce health disparities?	We showed 10 adults with moderate or severe asthma who had not previously registered for a patient portal how to activate an account and complete seven navigation	In addition, the format of the presentation of patient portal informatio	Portal used and was valuable to the patients

s reduce health disparities? A perspective from asthma. Annals Of The American Thoracic Society, 11(4), 608-612 5p. doi:10.1513/AnnalsATS.201401-032PS			tasks: (1) locate a laboratory test result, (2) look up an upcoming doctor's appointment, (3) learn how to schedule an appointment with their provider (the opportunity to actually make the appointment was offered), (4) locate their medication list, (5) locate their immunization record, (6) determine how to request a refill, and (7) send a secure message to their care team. The age range was 21 to 65 years, nine were women, and six had a household income less than $10,000/yr; all but one had completed high school. Five had access to a computer at home, and only one had no access other than at their health center or community establishments. Three had never used the internet, and six did not have an active e-mail account. Five had limited typing skills. Nonetheless, all participants accomplished with ease the seven tasks after instruction. Most thought that the portal was convenient (n = 7) and very easy to use (n = 10). Reasons given for not	n has not been extensively examined for comprehensibility. Nevertheless, we have found from focus groups that patients value the information available in a portal.	

			returning to the portal after the study was completed included forgetting log-in information and not having computer access at home. Thus, patients use the internet and are interested in learning about it, but access to portals is not equally available.		
Bastos, A., Paiva, D., & Azevedo, A. (2014). Quality of health information on acute myocardial infarction and stroke in the world wide web. Acta Médica Portuguesa, 27(2), 223-231.	Qualitative Research	The quality of health information in the Internet may be low. This is a concerning issue in cardiovascular diseases which warrant patient self-management. We used the search on Google(®), respectively, using Internet Explorer(®). The first 200 URL retrieved in each search were independently visited. We analyzed and classified 121 websites for structural characteristics, information coverage and accuracy of the web pages with	Results: Websites were most frequently commercial (49.5%), not exclusively dedicated to acute myocardial infarction/ stroke (94.2%), and with information on medical facts (59.5%), using images, video or animation (60.3%). Websites' trustworthiness was low. None of the websites displayed the Health on the Net Foundation seal. Acute myocardial infarction/ stroke websites differed in information coverage but the accuracy of the information was acceptable, although often incomplete.	Conclusion: The quality of information on acute myocardial infarction/ stroke in websites was acceptable. Trustworthiness was low, impairing users' capability of identifying potentially more reliable content.	Trustworthiness of the heart websites was low and incomplete.

		items defined a priori, trustworthiness in general according to the Health on the Net Foundation and regarding treatments.			
Bender Ignacio, R. A., Chu, J., Power, M. C., Douaiher, J., Lane, J. D., Collins, J. P., & Stone, V. E. (2014). Influence of providers and nurses on completion of non-targeted HIV	Research	The Center for Disease Control and Prevention (CDC) estimates that of the 1.1 million people living with HIV/AIDS in the U.S., an estimated 18% do not know they are infected. Free HIV screening was offered to all patients aged 18-65 following a new screening protocol implemented in the urgent care unit, in which patients answered two brief questions in triage regarding whether they had recently taken an HIV test and if they were available to testing during their current visit.	Both the visit provider and the triaging nurse interacting with the patient were highly associated with acceptance of HIV screening, with a 8.7-fold difference in testing rates among distinct providers and 2.6-fold difference among nurses. Only half of the visits led to the initiation of the screening questionnaire by triage nurses, 36% of the patients accepted to go through the screening process, which was completed in 23% of the cases.	Implementation of the screening tools in the EHR were beneficial.	Need screening tools implemented in the EHR to promote a diagnosis of HIV

screening in an urgent care setting. AIDS Research and Therapy, 11 (1), 24. doi:10.1186/1742-6405-11-24					
Brannagan, K. (2011). Demographic factors in predicting physical activity among college freshmen the role of	Research	The study population was college freshmen in southeast Louisiana who were between the ages of 18 and 24 years. Method: A path analysis was used to examine the strength and directional relationship among variables depicted in Pender's Health Promotion Model (HPM) and to determine the structure of the relationships among the	Results: Study results portrayed a relationship between perceived exertion and exercise self-efficacy and a relationship between a person's belief in their ability to stick to an exercise program (self-efficacy) and their level of activity. Compared to their counterparts, this study's population had lower levels of usual physical activity, but heightened levels of physical activity immediately following hurricanes Katrina and Rita.	Conclusion: This study adds to the body of knowledge related to predictors of physical activity and the applicability of Pender's HPM to such studies.	Motivating factors to promote healthy lifestyle.

exercise self-efficacy, perceived exertion, event-related stress, and wellness. Health Education Journal. 70(11), 365. doi: 10.1177/0017896910387315		variables in the conceptual map. Path coefficients were used to determine whether the independent variables (exercise self-efficacy, stress, perceived exertion, demographic factors) as depicted in the path diagram made a unique contribution to predicting physical activity (dependent variable) or if the relationships between stress, perceived exertion, and physical activity, are mediated by exercise self-efficacy.			
Christopoulos, K. A., Massey, A. D., Lopez, A. M., Geng, E. H., Johns	Research	In order to understand meaningful steps in the HIV care cascade for individuals diagnosed with HIV through expanded, more routine testing, we conducted in-depth interviews	Studied were those diagnosed with HIV in the emergency department/urgent care clinic who linked to HIV care and exhibited 100% appointment adherence in the first 6 months of HIV care; those diagnosed in the emergency department/urgent care clinic who linked to HIV	Interventions to support engagement in care should acknowledge that patient concerns change over time and focus	Need portal to remind HIV patients to come to follow up appt.

on, M. O., Pilcher, C. D., & Dawson-Rose, C. (2013).'Taking a half day at a time:' Patient perspectives and the HIV engagement in care continuum. AIDS Patient Care & Standards, 27(4), 223-230. doi:10.1089/apc.2012.0418		(n=34) with three groups of individuals:	care and exhibited sporadic appointment adherence in the first 6 months of HIV care, and; hospitalized patients with no outpatient HIV care for at least 6 months. This last group was chosen to supplement data from in-care patients. Participants (n=34) were evenly divided between the well-engaged [i.e., those who had missed no primary care appointments in the first 6 months of clinic care (n=11)], more sporadic users [i.e., those who had missed one or more primary care visits in the first 6 months of clinic care (n=13)], and the out of care (n=10). Of the participants whose HIV was diagnosed in the ED or UCC (n=24), the median time since diagnosis at study participation was 24 months (range 6–62 months). Consistent with other literature, nearly all participants cited appointment reminders as facilitators to keeping appointments and lack of clinic staff to consistently answer and return phone calls as a barrier to retention in care. Patients described having to navigate administrative aspects of	on promoting shifts in perspective.	

			the health care system without becoming overwhelmed in order to remain in care.		
Das, A., Faxvaag, A., & Svanæs, D. (2015). The Impact of an eHealth Portal on Health Care Professionals' Interaction with Patients: Qualitative Study. Journal Of Medical Internet Research, 17(11), e267.	Research	The impact of an eHealth portal on health care professionals interactions with patients. 60 patients studied.	The analysis revealed two main dimensions of using an eHealth portal in bariatric surgery: the transparency it represents and the responsibility that follows by providing it. The professionals reported the eHealth portal as (1) a source of information, (2) a gateway to approach and facilitate the patients, (3) a medium for irrevocable postings, (4) a channel that exposes responsibility and competence, and (5) a tool in the clinic.	Conclusions: By providing an eHealth portal to patients in a bariatric surgery program, health care professionals can observe patients' writings and revelations thereby capturing patient challenges and acting and implementing measures. Interacting with patients through the portal can prevent dropouts and deterioration of patients' health. However, professionals report on	Portal was helpful for education, link to patient, and helps the clinic to determine what things need to be corrected from patient responses.

doi:10.2196/jmir.4950				organizational challenges and personal constraints related to communicating with patients in writing online.	
Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13, 983-1003.	Research about internet use behavior in the past	A sample of 150 respondents was selected using a purposive sampling method, the respondents have to be Internet users to be included in the survey. A structured, self-administered questionnaire was used to elicit responses from these respondents.	The findings indicate that perceived ease of use ($\beta = 0.70$, $p<0.01$) and perceived enjoyment ($\beta =0.32$, $p<0.05$) were positively related to intention whereas perceived usefulness was not significantly related to intention. Furthermore, perceived ease of use ($\beta = 0.78$, $p<0.01$) was found to be a significant predictor of perceived usefulness.	This goes to show that ease of use and enjoyment are the 2 main drivers of intention to be online.	Identifies the past trend of computer use satisfaction and usefulness in the patients everyday lives since the invention of computers.
Durand, A., Palazzolo,	Research	Semi-structured interviews were conducted in 10 EDs with 87	Interviews of patients revealed three themes: (1) fulfilled health care needs, (2) barriers to	Conclusions: Studies on the underlying	Patients use urgent care for

S., Tanti-Hardouin, N., Gerbeaux, P., Sambuc, R., & Gentile, S. (2012) Nonurgent patients in emergency departments: rational or irresponsible consumers? Perceptions of professionals and patients. BMC Research Notes, 5(525		nonurgent patients and 34 health professionals.	primary care providers (PCPs), and (3) convenience. Patients chose EDs as discerning health consumers: they preferred EDs because they had difficulties obtaining a rapid appointment. Access to technical facilities in EDs spares the patient from being overwhelmed with appointments with various specialists. Four themes were identified from the interviews of health professionals: (1) the problem of defining a nonurgent visit, (2) explanations for patients' use of EDs for nonurgent complaints, (3) consequences of nonurgent visits, and (4) solutions to counter this tendency.	reasons patients opt for the ED, as well as on their decision-making process, are lacking. The present study highlighted discrepancies between the perceptions of ED patients and those of health professionals, with a special focus on patient behaviour. To explain the use of ED, health professionals based themselves on the acuity and urgency of medical problems, while patients focused on rational reasons to initiate	primary needs.

). Retrieved from http://www.biomedcentral.com/1756-0500/5/525				care in the ED (accessibility to health care resources, and the context in which the medical problem occurred).	
Edmunds, M. R., Denniston, A. K., Boelaert, K., Franklyn, J. A., & Durrani, O. M. (2014). Patient information in Graves' disease and thyroid-associated ophthalmop	Research	The Internet is a vital source of information for patients hoping to learn more about their disease. Health literacy of the general population is known to be poor, with the U.S. Department of Health and Human Services (USDHHS) recommending that patient-oriented literature be written at a fourth- to sixth-grade reading level to optimize comprehensibility. In this study we assessed the readability of online literature specifically for	top 20 English-language GD patient-oriented online resources and top 30 of the equivalent TAO resources returned by Google search was analyzed. : Overall, median word count (with interquartile range [IQR] and range) was 990 (IQR 846, 195-3867), with a median of 18 words per sentence (IQR 4.0, 7.5-28). Median Flesch Reading Ease Score was 46 (IQR 13, 24-64), Flesch-Kincaid Grade Level 11 (IQR 3.0, 7.2-17), Simple Measure of Gobbledygook 13 (IQR 2.0, 9.6-17), and Gunning-Fog Index 13 (IQR 3.0, 9.2-19), each equivalent to a reading level of >11th grade and "difficult" on the USDHHS classification. None of the web pages evaluated had readability scores in accordance with published guidelines.	Conclusions: Readability scores for online GD and TAO patient-focused materials are inferior to those recommended. Screening of this online material, as well as subsequent revision, is crucial to increase future patient knowledge, satisfaction, and compliance	Patients use the internet for information and that information is inferior to what is recommended.

athy: readability assessment of online resources. Thyroid: Official Journal of the American Thyroid Association, 24(1), 67-72. doi:10.1089/thy.2013.0252		Graves' disease (GD) and thyroid-associated ophthalmopathy (TAO).			
Edwards, K. L., Salvo, M. C., Ward, K. E., Attridge, R. T., Kiser, K., Pinner, N. A., &	Research	Health care professionals, trainees, and patients use the Internet extensively. Editable Web sites may contain inaccurate, incomplete, and/or outdated information that may mislead the public's	The authors found that Wikipedia, a public domain that allows users to update, was consistently the most common Web site produced in search results. Results: The authors' evaluation resulted in the creation or revision of 14 Wikipedia Web pages. However, rejection of 3 proposed newly created Web pages affected the	Conclusions: Through assessing and updating editable Web sites, the authors strengthened the online representation of clinical pharmacy	Websites may contain inaccurate, incomplete and outdated information thereby misleading the patient.

Bookstaver, P. B. (2014). Assessment and revision of clinical pharmacy practice internet websites. The Annals of Pharmacotherapy, 48(2), 258-267. doi:10.1177/1060028013510899		perception of the topic. The authors identified key areas within clinical pharmacy to evaluate for accuracy and appropriateness on the Internet.	authors' ability to address identified content areas with deficiencies and/or inaccuracies.	in a clear, cohesive, and accurate manner. However, ongoing assessments of the Internet are continually needed to ensure accuracy and appropriateness	
Engel, K., Heisler, M., Smith, D., Robinson, C.,	Research	Patient comprehension of emergency department care and instructions: Are patients aware when they do not	140 adult patients or primary care providers. Seventy-eight percent of patient's demonstrated deficient comprehension (less than complete concordance) in at least 1 domain; 51% of patients, in 2 or more domains.	Conclusion Many patients do not understand their ED care or their discharge	Patients do not understand their ER post visit education.

Forman, J., & Ubel, P. (2009)Patient comprehension of emergency department care and instructions: Are patients aware when they do not understand? Annals of Emergency Medicine, 53(4), 454-461.Retrieved from http://www.annemergmed.c		understand?140 adult patients or primary care providers.	Greater than a third of these deficiencies (34%) involved patients' understanding of post-ED care, whereas only 15% were for diagnosis and cause. The majority of patients with comprehension deficits failed to perceive them. Patients perceived difficulty with comprehension only 20% of the time when they demonstrated deficient comprehension.	instructions. Moreover, most patients appear to be unaware of their lack of understanding and report inappropriate confidence in their comprehension and recall.	

om/article/s0196-0644(08)00831-7/abstract					
Escobedo, M., Kirtane, J., & Berman, A. (2012). Health information technology: A path to improved care transitions and proactive patient care. Generations, 36 (4), 56-62. Retrie	Article		A discussion of the status of health information technology (IT) and technology's role in improving care transitions. The article also describes a multi-sector effort to promote high-quality, IT-enabled care transitions that led to a 2011 national conference, “Putting the IT in Care TransITions,”.		

ved from http://www.ingentaconnect.com/content/asag/gen/2012/00000036/00000004/art00008					
Fiks, A. G., Mayne, S. L., Karavite, D. J., Suh, A., O'Hara, R., Localio, A. R., ... Grundmeier, R. W. (2015). Parent-reported outcomes of a shared	Research	Parent-reported outcomes of a shared decision-making portal in asthma: A practice-based RCT. We conducted a 6-month randomized controlled trial of MyAsthma at 3 primary care practices. Families were randomized to MyAsthma, which tracks families' asthma treatment concerns and goals, children's asthma symptoms, medication side effects and adherence, and provides	Results: We enrolled 60 families, 30 in each study arm (mean age 8.3 years); 57% of parents in the intervention group used MyAsthma during at least 5 of the 6 study months. Parents of children with moderate to severe persistent asthma used the portal more than others; 92% were satisfied with MyAsthma. Parents reported that use improved their communication with the office, ability to manage asthma, and awareness of the importance of ongoing attention to treatment. Parents in the intervention group reported that children had a lower frequency of asthma flares and intervention parents missed fewer days of	Conclusions: Use of an EHR-linked asthma portal was feasible and acceptable to families and improved clinically meaningful outcomes	Use of the portal for asthma patients was beneficial to both patient and family in helping control their asthma.

d decision-making portal in asthma: A practice-based RCT. Pediatrics, 135(4), e965-e973. doi:10.1542/peds.2014-3167		decision support, or to standard care. Outcomes included the feasibility and acceptability of MyAsthma for families, child health care utilization and asthma control, and the number of days of missed school (child) and work (parent). Descriptive statistics and longitudinal regression models assessed differences in outcomes between study arms.	work due to asthma.		
Fioretti, B. S., Reiter, M., Betrán, A. P., & Torloni, M. R. (2015). Googling caesarean section: A	Research	Googling caesarean section: A survey on the quality of the information available on the Internet. A total of 3900 web pages were retrieved and 176 fulfilled the selection criteria.	The overall average DISCERN score was 43.6 (±8.9 SD), of a maximum score of 75; 30% of the pages were of poor or very poor quality and 47% were of moderate quality. Most pages scored low, especially in questions related to reliability of the information. The most frequently covered topics were: indications for caesarean section (80% of websites), which did not reflect clinical practice; short-term maternal risks (80%);	Conclusions: The quality and completeness of web-based resources in Portuguese about caesarean section were poor to moderate. Pending improvement of these resources,	Websites did not have accurate or complete information.

survey on the quality of the information available on the Internet. BJOG: An International Journal of Obstetrics and Gynecology, 122(5), 731-739. doi:10.1111/1471-0528.13081			and potential benefits of caesarean section (56%), including maternal and doctor convenience. Less than half of the websites mentioned perinatal risks and less than one-third mentioned long-term maternal risks associated with caesarean section, such as uterine rupture (17%) or placenta praevia/accreta (12%) in future pregnancies.	obstetricians should warn pregnant women about these facts and encourage them to discuss what they have read on the Internet about caesarean section.	
Gagnon, M. P., Orruño, E., Asua, J., Abdeljelil,	Research Technology	A questionnaire, based on the Technology Acceptance Model (TAM), was developed. A panel of experts in technology	RESULTS: A response rate of 39.7% was achieved. With the exception of one theoretical construct (Habit) that corresponds to behaviors that become automatized, Cronbach alpha values were	CONCLUSION: The TAM is a good predictive model of healthcare professionals'	Increasing awareness of providers about electronic monitor

A. B., & Empa ranza, J. (2012). Using a modif ied techn ology accept ance model to evalu ate health care profes sional s' adopti on of a new telem onitor ing syste m. Telem edicin e Journ al and E-Healt h, 18(1), 54– 59. doi:10 .1089/	A cc ep ta nc e M od el	assessment evaluated the face and content validity of the instrument. Two hundred and thirty-four questionnaires were distributed among nurses and doctors of the cardiology, pulmonology, and internal medicine departments of a tertiary hospital.	acceptably high for the remaining constructs. Theoretical variables were well correlated with each other and with the dependent variable. The original TAM was good at predicting tele monitoring usage intention, Perceived Usefulness being the only significant predictor (OR: 5.28, 95% CI: 2.12-13.11). The model was still significant and more powerful when the other theoretical variables were added. However, the only significant predictor in the modified model was Facilitators (OR: 4.96, 95% CI: 1.59-15.55).	intention to use telemonitor ing. However, the perception of facilitators is the most important variable to consider for increasing doctors' and nurses' intention to use the new technology .	ing of patients .

tmj.2011.0066					
Ghobrial, G. M., Mehdi, A., Maltenfort, M., Sharan, A. D., & Harrop, J. S. (2014). Variability of patient spine education by Internet search engine. Clinical Neurology and Neurosurgery, 11(8) 59-64. doi:10	Research	Patients are increasingly reliant upon the Internet as a primary source of medical information. The educational experience varies by search engine, search term, and changes daily. There are no tools for critical evaluation of spinal surgery websites.	Google was more likely than Bing and Yahoo search engines to return hospital ads (P=0.002) and more likely to return scholarly sites of peer-reviewed lite (P=0.003). Educational web sites, surgical group sites, and online web communities had a significantly higher likelihood of returning on any search, regardless of search engine, or search string (P=0.007). Likewise, professional websites, including hospital run, industry sponsored, legal, and peer-reviewed web pages were less likely to be found on a search overall, regardless of engine and search string (P=0.078).	Professional websites and hospital run ones were less likely to be found by google searching.	Professional education is difficult to find through a basic internet search.

.1016/j.clineuro.2013.12.013					
Gany, F., Ramirez, J., Nierodzick, M. L., McNish, T., Lobach, I., & Leng, J. (2011). Cancer portal project: A multidisciplinary approach to cancer care among Hispanic patients. Journal of Oncology Practice,	Research	Cancer portal project: A multidisciplinary approach to cancer care among Hispanic patients. A total of 328 Hispanic patients participated in the study.	Of these, 89% preferred to speak Spanish in the health care setting, and 17% had no health insurance. The most common cancer diagnosis among participants was breast cancer (35%) followed by GI (17%) and gynecologic (16%) cancers. Patients most commonly requested financial support (59%), food support (37%), transportation assistance (21%), social work services (14%), psychosocial support (6%), help with health insurance issues (5%), and legal services (5%). In a follow-up assessment of high-need patients in urgent need of financial support, 86% reported that portal services helped them attend cancer care and treatment appointments, and 72% reported that portal services decreased worry about their care.	CONCLUSION: Most patients reported that financial, social, and logistical support would help them attend their appointments for cancer care and treatment. Further multidisciplinary interventions should be implemented and evaluated to address social and economic determinants in cancer care for this population.	Health portals helped patients with follow up appointments and helped with worry.

7(1), 31-38. doi:10.1200/JOP.2010.000036					
Govea, J., Van Stiphout, F., Cheung, Z., Kamta, B., Keijsers, C., Valk, G., … Ter Braak, E. (2013). Educational interventions to improve the meaningful use of electronic health records: A review of	Research review of articles	Electronic health records (EHRs) are increasingly available and this was expected to reduce healthcare costs and medical errors. This promise has not been realized because healthcare professionals are unable to use EHRs in a manner that contributes to significant improvements in care, i.e. meaningful. Policymakers now acknowledge that training healthcare professionals in meaningful use is essential for successful EHR implementation. To help educators and policymakers	METHODS: We used a predefined search filter to search eight databases for studies that considered an educational intervention to promote meaningful use of EHRs by healthcare professionals. RESULTS: Seven of the 4507 reviewed articles met the in- and exclusion criteria.	CONCLUSIONS: These studies suggest that a combination of classroom training, computer-based training and feedback is most effective to improve meaningful use. In addition, the training should be tailored to the needs of the trainees and they should be able to practice in their own time. However, the evidence is very	EHR meaningful use has its struggles, one being education of the healthcare providers. They recommend someone make evidence based educational interventions to make them useful. ***** Health portal access and the TAM ? can help with making

the literature: BEME guide no. 29. Medical Teacher, 35(11), e1551-e1560. doi:10.3109/0142159X.2013.806984		design evidence based educational interventions (i.e. interventions that involve educational activities but no practical lessons) and training (i.e. interventions that involve practical components), we summarized all evidence regarding the efficacy of different educational interventions to improve meaningful use of EHRs.		limited and we recommend that governments, hospitals and other policymakers invest more in the development of evidence based educational interventions to improve meaningful use of EHRs.	it meaningful for the patients thereby bringing meaning to the providers
Grant, R., Wald, J., Poon, E., Schnipper, J., Gandhi, T., Volk, L., & Middleton, B. (2006). Desig	Research	Despite the availability of expert guidelines and widespread diabetes quality improvement efforts, care of patients with diabetes remains suboptimal. Two key barriers to care that may be amenable to informatics-based interventions	Results= Partners HealthCare System (Boston, MA), a multi-hospital health care network comprising several thousand physicians caring for over 1 million individual patients, has developed a comprehensive patient web-portal called Patient Gateway that allows patients to interact directly with their EHR via secure Internet access. Using this portal, a specific diabetes interface was designed to maximize patient	Conclusions= We successfully designed and implemented a Diabetes Patient portal that allows direct interaction with our system's EHR. We are assessing the impact	Health portals and diabetes care plan

n and implementation of a web-based patient portal linked to an ambulatory care electronic health record: Patient gateway for diabetes collaborative care. Diabetes Technology & Therapeutics, 8(5), 576-586.		include (1) lack of patient engagement with therapeutic care plans and (2) lack of medication adjustment by physicians ("clinical inertia") during clinical encounters. Methods- The authors describe the conceptual framework, design, implementation, and analysis plan for a diabetes patient web-portal linked directly to the electronic health record (EHR) of a large academic medical center via secure Internet access designed to overcome barriers to effective diabetes care.	engagement by importing the patient's current clinical data in an educational format, providing patient-tailored decision support, and enabling the patient to author a "Diabetes Care Plan." The physician view of the patient's Diabetes Care Plan was designed to be concise and to fit into typical EHR clinical workflow.	of this advanced informatics tool for collaborative diabetes care in a clinic-randomized controlled trial among 14 primary care practices within our integrated health care system.	
Health Mirror		PEMAT-P tool users	Discussed PEMAT-P understandability at 70% and actionability at any percentage due to high	Use for scoring	PEMAT-P

(2016) What is a PEMAT? Retrieved from www.health-mirror.com/TheMirror/PEMAT.aspx			content on definitions of the topic instead of actions.		
Horvath, M., Levy, J., L'Engle, P., Carlson, B., Ahmad, A., & Ferranti, J. (2011). Impact of health portal enrollment with email remin	Research	Our objective was to test whether portal enrollment with email reminder functionality is significantly related to decreases in rates of appointment "no-shows," which are known to impair clinic operational efficiency. Appointment activity during a 1-year period was examined for all patients attending one of seven clinics. Patients were categorized as	Results: Across seven clinics, 58,942 patients, 15.7% (9239/58,942) of whom were portal enrollees, scheduled 198,199 appointments with an overall no-show rate of 9.9% (19,668/198,199). We found that HVP enrollees were significantly more likely to be female, white, and privately insured compared with nonusers. Bivariate no-show rate differences between portal enrollment groups varied widely according to patient- and appointment-level attributes. Large reductions in no-show rates were seen among historically disadvantaged groups:	Conclusions: Monthly no-show rates across all seven Duke Medicine clinics were significantly reduced among patients who registered for portal use, suggesting that in combination with an email reminder feature, this technology	Health portal reduced the number of patient appointments not being missed due to the reminder feature

ders on adherence to clinic appointments: A pilot study. Journal of Medical Internet Research, 13(2). doi:10.2196/jmir.1702		portal enrollees or as nonusers either by their status at time of appointment or at the end of the 1-year period.	Medicaid holders (OR = 2.04 for nonuser/enrollee, 5.6% difference, P < .001), uninsured patients (OR = 2.60, 12.8% difference, P < .001), and black patients (OR = 2.13, 8.0% difference, P < .001). After fitting a binomial logistic regression model for the outcome of appointment arrival, the adjusted odds of arrival increased 39.0% for portal enrollees relative to nonusers (OR = 1.39, 95% CI 1.22 - 1.57, P < .001). Analysis of monthly no-show rates over 2 years demonstrated that patients who registered for portal access and received three reminders of upcoming appointments (email, phone, and mail) had a 2.0% no-show rate reduction (P < .001), whereas patients who did not enroll and only received traditional phone and mail reminders saw no such reduction (P < .09).	may have an important and beneficial effect on clinic operations.	
Hsiao, C., & Hing, E. (2014). Use	Research	Use and characteristics of electronic health record systems among office-based physician	In 2013, 78% of office-based physicians used any type of electronic health record (EHR) system, up from 18% in 2001. In 2013, 48% of office-based physicians	The Health Information Technology for Economic and	Meaningful use stats

and characteristics of electronic health record systems among office-based physician practices: United States, 2001-2013. NCHS Data Brief, 143, 1-8.		practices	reported having a system that met the criteria for a basic system, up from 11% in 2006. The percentage of physicians with basic systems by state ranged from 21% in New Jersey to 83% in North Dakota. In 2013, 69% of office-based physicians reported that they intended to participate (i.e., they planned to apply or already had applied) in "meaningful use" incentives. About 13% of all office-based physicians reported that they both intended to participate in meaningful use incentives and had EHR systems with the capabilities to support 14 of the Stage 2 Core Set objectives for meaningful use. From 2010 (the earliest year that trend data are available) to 2013, physician adoption of EHRs able to support various Stage 2 meaningful use objectives increased significantly.	Clinical Health (HITECH) Act of 2009 authorized incentive payments to increase physician adoption of electronic health record (EHR) systems. The Medicare and Medicaid EHR Incentive Programs are staged in three steps, with increasing requirements for participation. To receive an EHR incentive payment, physicians must show that they are "meaningfully using" certified EHRs by meeting certain	

				objectives. This report describes trends in the adoption of EHR systems from 2001 through 2013, as well as physicians' intent to participate in the EHR Incentive Programs and their readiness to meet 14 of the Stage 2 Core Set objectives for meaningful use in 2013.	
Hsiao, C., Hing, E., Socey, T. C., & Cai, B. (2011). Electronic health record syste	Research Healthportal and meaning	Electronic health record systems and intent to apply for meaningful use incentives among office-based physician practices	In 2011, 57% of office-based physicians used electronic medical record/electronic health record (EMR/EHR) systems, with use by state ranging from 40% in Louisiana to 84% in North Dakota. About one-third of physicians (34%) reported having a system that met the criteria for a basic system, ranging by state from 16% in New Jersey to 61% in Minnesota. In	The 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act authorized incentive payments through	Meaningful use stats

ms and intent to apply for meaningful use incentives among office-based physician practices: United States, 2001-2011. NCHS Data Brief, (79), 1-8.	ful use		2011, 52% of physicians reported intending to apply for meaningful use incentives, up from 41% in 2010. In 2010, 43% of physicians planning to apply for meaningful use incentives had computerized systems that would allow them to meet eight Stage 1 Core Set objectives, with percentages by state ranging from 26% in Texas to 70% in Wisconsin.	Medicare and Medicaid to increase physician adoption of electronic health record (EHR) systems . Eligible Medicare and Medicaid physicians may receive incentive payments over 5 years if they demonstrate 15 Stage 1 Core Set objectives and 5 of 10 Menu Set objectives, using certified EHR systems. This report describes trends in adoption of electronic medical record/electronic health record (EMR/EH	

				R) systems through 2011 and provides baseline information on physician readiness to meet eight Stage 1 Core "meaningful use" objectives in 2010 (see "Definitions" section for an overview of meaningful use objectives). Data are reported from 2010 and 2011 mail surveys of physicians in the National Ambulatory Medical Care Survey (NAMCS) and in earlier years of the survey	
Hussain, M.	Rese	Hypertensive patients'	Results: For healthcare awareness, people look	Conclusion: The study	Health portal

I., Naqvi, B., Ahmed, I., & Ali, N. (2015). Hypertensive patients' readiness to use of mobile phones and other information technological modes for improving their compliance to doctors' advice in Karachi. Pakistan Journ	arch	readiness to use of mobile phones and other information technological modes for improving their compliance to doctors' advice. Total 400 persons (200 males & 200 females) were randomly selected.	for health programs on radio and TV channels. Short Message Service (SMS) and phone are highly appreciated by patients for reminders. To increase compliance to doctors' advice, less educated people prefer phone calls over SMS whereas educated individuals favor SMS. Although price of medicine has not emerged as a major contributing factor for non-compliance, discount on medicinal products is highly appreciated by the patients.	concludes that there is a widespread awareness of high blood pressure in the sample population 72.5%. People consider reminder message system i.e. Calls and Short Messaging Service (SMS) would help them in improving compliance to doctors' advice.	messaging helped with complying with medical advice regarding their hypertension

al of Medical Sciences, 31(1), 9-13. doi:10.12669/pjms.311.5469					
Jones, J. B., Weiner, J. P., Shah, N. R., & Stewart, W. F. (2015). The wired patient: patterns of electronic patient portal use among patients with cardiac disease	Research	The wired patient: patterns of electronic patient portal use among patients with cardiac disease or diabetes. We analyzed 12 months of data from Web server log files on 2282 patients using a Web-based portal to their electronic health record (EHR). We obtained data for patients with cardiovascular disease and/or diabetes who had a Geisinger Clinic primary care provider and were registered "MyGeisinger" Web portal users. Hierarchical cluster analysis	Results: We identified eight distinct portal user groups. The two largest groups (41.98%, 948/2258 and 24.84%, 561/2258) logged into the portal infrequently but had markedly different levels of engagement with their medical record. Other distinct groups were characterized by tracking biometric measures (10.54%, 238/2258), sending electronic messages to their provider (9.25%, 209/2258), preparing for an office visit (5.98%, 135/2258), and tracking laboratory results (4.16%, 94/2258).	Conclusions: There are naturally occurring groups of EHR Web portal users within a population of adult primary care patients with chronic conditions. More than half of the patient cohort exhibited distinct patterns of portal use linked to key features.	Health portal use among chronic health patients with cardiac disease or diabetes who were engaged in their health

e or diabetes. Journal Of Medical Internet Research, 17(2), e42. doi:10.2196/jmir.3157		was applied to longitudinal data to profile users based on their frequency, intensity, and consistency of use. User types were characterized by basic demographic data from the EHR.			
Jhamb, M., Cavanaugh, K. L., Bian, A., Chen, G., Ikizler, T. A., Unruh, M. L., & Abdel-Kader, K. (2015). Disparities in Electronic Health	Research	Disparities in Electronic Health Record Patient Portal Use in Nephrology Clinics. Of 2803 patients, 1098 (39%) accessed the portal.	Over 87% of users reviewed laboratory results, 85% reviewed their medical information (e.g., medical history), 85% reviewed or altered appointments, 77% reviewed medications, 65% requested medication refills, and 31% requested medical advice from their renal provider. In adjusted models, older age, African-American race (odds ratio [OR], 0.50; 95% confidence interval [95% CI], 0.39 to 0.64), Medicaid status (OR, 0.53; 95% CI, 0.36 to 0.77), and lower neighborhood median household income were associated with not accessing the portal. Portal adoption increased over time (2011 versus 2010: OR, 1.38 [95% CI,	Conclusion: While portal adoption appears to be increasing, greater attention is needed to understand why vulnerable populations do not access it.	Health portal used by nephrology patients and helped with blood pressure control.

Record Patient Portal Use in Nephrology Clinics. Clinical Journal Of The American Society Of Nephrology: CJASN, 10(11), 2013-2022. doi:10.2215/CJN.01640215			1.09 to 1.75]; 2012 versus 2010: OR, 1.95 [95% CI, 1.44 to 2.64]). Portal adoption was correlated with BP control in patients with a diagnosis of hypertension; however, in the fully adjusted model this was somewhat attenuated and no longer statistically significant (OR, 1.11; 95% CI, 0.99 to 1.24).		
Khanna, R., Karikalan, N., Mishra, A. K., Agarwal, A.,	Research	The portal was launched in July 2010 and provides free access to full-text of 900 resource materials categorized under specific topics and themes. During	Nearly 44,000 unique visitors visited the website and spent an average time of 4 minutes 26 seconds. The overall bounce rate was 27.6%. An increase in the number of unique visitors was found to be significantly associated with an increase in the average time on site (p-	Conclusions= Efficient management of health information is imperative for informed decision making,	Health portals have become the preferred method of informed decisio

Bhattacharya, M., & Das, J. K. (2013). Repository on maternal child health: Health portal to improve access to information on maternal child health in India. BMC Public Health, 132. doi:10.1186/1471-2458-13-2		the subsequent 18 months, 52,798 visits were registered from 174 countries across the world, and more than three-fourth visits were from India alone.	value 0.01), increase in the web traffic through search engines (p-value 0.00), and decrease in the bounce rate (p-value 0.03). There was a high degree of agreement between the two experts regarding quality assessment carried out under the three domains of knowledge access, knowledge creation and knowledge transfer (Kappa statistic 0.72).	and digital repositories have now-a-days become the preferred source of information management. The growing popularity of the portal indicates the potential of such initiatives in improving access to quality and essential health information. There is a need to develop similar mechanisms for other health domains and interlink them to facilitate access to a variety of health information from a	n making and education for patients.

				single platform.	
King, J., Patel, V., Jamoom, E. W., & Furukawa, M. F. (2014). Clinical benefits of electronic health record use: National findings. Health Services Research, 49(1 Pt 2), 392-404. doi:10.1111/1475-6773.12135	Research	Clinical benefits of electronic health record use	Most physicians with EHRs reported EHR use enhanced patient care overall (78 percent), helped them access a patient's chart remotely (81 percent), and alerted them to a potential medication error (65 percent) and critical lab values (62 percent). Between 30 and 50 percent of physicians reported that EHR use was associated with clinical benefits related to providing recommended care, ordering appropriate tests, and facilitating patient communication. Using EHRs that met Meaningful Use criteria and having 2 or more years of EHR experience were independently associated with reported benefits. Physicians with EHRs meeting Meaningful Use criteria and longer EHR experience were most likely to report benefits across all 10 measures.	Conclusions Physicians reported EHR use enhanced patient care overall. Clinical benefits were most likely to be reported by physicians using EHRs meeting Meaningful Use criteria and longer EHR experience.	EHR helpful to healthcare providers and make meeting meaningful use guidelines easier.
Koonce, T.	Rese	Patient access to health	One of six proposed aims for improving quality of	Anecdotal feedback	Patient engage

Y., Giuse, D. A., Beauregard, J. M., & Giuse, N. B. (2007). Toward a more informed patient: Bridging health care information through an interactive communication portal. Journal of the Medical Library Association,	ar ch	information and personal health records is becoming increasingly important in today's healthcare society. With eight out of ten online users searching for medical information, patients seek to be informed in matters of health. In parallel with this high demand, the Institute of Medicine's Crossing the Quality Chasm report further highlights the critical need for patient involvement in the healthcare process.	care, the ''patient-centered'' approach of providing care that respects and incorporates patient preferences in clinical decision making, requires adequate information, communication and education As of July 2006, there were approximately twenty-five health topics linked to MHAV, with 15% of patients (2,700/18,000) using the portal having accessed the library-provided links. Since July 2005, an average of 850 new user accounts has been created each month.	on the integrated lab links—collected from reports of clinical team members, patient responses during MHAV focus groups, and comments from other MHAV team members—has thus far been highly positive; both patients and clinicians have expressed enthusiastic appreciation for the health information materials.	d in care due to health portal education

95(1), 77–81.					
Kowal, C. D. (2010). Implementing the critical care pain observation tool using the IOWA model. The Journal of the New York State Nurses' Association, 41(1), 4-10.	Article IOWA Model use		Utilization of the Iowa Model of evidence-based practice (EBP) helps to facilitate change in nursing care. This was observed when an alteration in pain-rating assessment scales needed to be implemented at St. Joseph's Hospital Health Center in Syracuse, NY Research showed that the Critical Care Pain Observation Tool (CPOT) was psychometrically sound in assessing pain in the nonverbal (unconscious, unresponsive, and sedated) intensive care unit patient population. Successful implementation of a CPOT pilot program in the surgical intensive care unit at St. Joseph's was undertaken using the Iowa Model of EBP. Application of the Iowa Model provided a systematic framework for changing nursing practice by incorporating critical thinking, clinical inquiry and judgment, multidisciplinary collaboration, and facilitation of learning. As evidenced by implementation of the CPOT, organizational implementation of EBP		

			using the Iowa Model positively impacts change across an entire healthcare continuum through the improvement of patient care processes.		
Kruse, C. S., Bolton, K., & Freriks, G. (2015). The effect of patient portals on quality outcomes and its implications to meaningful use: A systematic review. Journal of Medical Internet	Research Limited support for portals	The effect of patient portals on quality outcomes and its implications to meaningful use. We identified any data-driven study, quantitative or qualitative, that examined a relationship between patient portals, or patient portal features, and outcomes. We also wanted to relate the findings back to Meaningful Use criteria. Over 4000 articles were screened, and 27 were analyzed and summarized for this systematic review.	Results: We identified 26 studies and 1 review, and we summarized their findings and applicability to our research question. Very few studies associated use of the patient portal, or its features, to improved outcomes; 37% (10/27) of papers reported improvements in medication adherence, disease awareness, self-management of disease, a decrease of office visits, an increase in preventative medicine, and an increase in extended office visits, at the patient's request for additional information. The results also show an increase in quality in terms of patient satisfaction and customer retention, but there are weak results on medical outcomes. Despite potential advantages to providing personalized patient-centered care, health care providers are concerned about the increasing workloads to meet patient demands, lost profits, insufficient security, and the high	Conclusions: The results of this review demonstrate that more health care organizations today offer features of a patient portal than in the review published in 2011. Articles reviewed rarely analyzed a full patient portal but instead analyzed features of a portal such as secure messaging, as well as disease management and monitoring. The ability of patients to be able to	Few studies about the health portal available and few that show outcomes related to its use.

Research, 17(2). doi:10.2196/jmir.3171			cost of acquiring and maintaining a patient portal system 11 of the 27 articles (41%) stated that there was insufficient security in the portal design [7,8,10,12,15,16,20,24,25,27,29]. Also in 11 of 27 articles, patients did not perceive the patient portal as user-friendly and had difficulty navigating Web applications due to a lack of patient technical support, education, and access to the Internet Although patients value the educational resources provided in their patient portal, in three articles, many patients reported difficulty understanding and navigating interactive resources such as health libraries in their patient portal [9,10,15]. A recurring theme in the literature is the inability of patients to understand medical terminology presented in the patient portal and not being knowledgeable about their own condition.	view their health information electronically meets the intent of Meaningful Use, Stage 2 requirements, but the ability to transmit to a third party was not found in the review.	
Lau, M., Campbell, H., Tang, T., Thom	Research	Patients included were those with diabetes who were newly referred to a Vancouver-based tertiary	Patients who logged in 1 or more times were defined as portal users (n=50); patients who never logged in to the portal were defined as non-users (n=107). A1C was measured at 2 time	CONCLUSION: Accessing an online patient portal is associated with	Health portal use showed decrease in diabetes A1C

pson, D. S., & Elliott, T. (2014). Impact of patient use of an online patient portal on diabetes outcomes. Canadian Journal of Diabetes, 38(1), 17-21. doi:10.1016/j.jcjd.2013.10.005		care diabetologist between April 2008 and October 2012. Each patient was assessed by the diabetologist, received initial diabetes education and was referred, as necessary, for further education and self-management training. All patients who provided an e-mail address at registration were invited to open an online patient portal account. The portal provided access to diabetes education material, personal laboratory values and a messaging system allowing communication with the diabetologist and staff.	points: at baseline (i.e. initial, in-clinic visit) and at last follow up (visit no less than 6 months and no more than 2 years after the initial visit). Because user ship is self-selected, propensity score matching was used to create comparable user/non-user groups based on available baseline covariates. RESULTS: Compared to non-users, a higher proportion of users achieved A1C ≤7% at follow up (56% vs. 32%) (p=0.031).	improved glycemic control.	level.
LeBreton, M. (2015	Doctoral		Outcomes of this project demonstrated the use of the health literacy tool and teach-back education		

). Implementation of a validated health literacy tool with teach-back education in a super utilizer patient population. Widener University. Retrieved from CINAHL Plus with Full Text, Ipswich, MA.	dissertation		with the verification of the patient's understanding yielded an 81% adherence to hypertension evidenced-base practice guidelines, a reduction in the number of visits to the emergency department and inpatient admissions to the hospital. Educating the Super Utilizer patient to their level of health literacy using the teach method of education served to empower the patients with knowledge for self-care and decreased their over utilization of health care services.		
Makai, P., Perry, M., Robben, S.	Research	Our aim was to (1) evaluate differences in use of a personal online health	Results: Of 622 frail patients in the intervention group, 290 were connected to ZWIP; 79 used ZWIP regularly (at least monthly). Main	Conclusions: Only 27.2% (79/290) of frail older enrolled in	Health portal use and elderly. They did use

H., Schers, H., Heinen, M., Olde Rikkert, M. G., & Melis, R. J. (2014). Which frail older patients use online health communities and why? A mixed methods process evaluation of use of the health and welfare portal. Journal of Medical Intern		community for frail older people and (2) explore barriers and facilitators for use as experienced by older people and their informal caregivers, using the case of the Health and Welfare Information Portal (ZWIP). Methods: we used POHC usage information (2 years follow-up) and baseline characteristics of frail older people. We used interviews with older people and their informal caregivers. Participants were recruited from 11 family practices and frail older people over 70 years. The ZWIP intervention is a personal online health community for frail older people, their informal	predictors for use were having an informal caregiver, having problems with activities of daily living, and having a large number of providers. Family practice level predictors were being located in a village, and whether the family practitioners had previously used electronic consultation and cared for a large percentage of frail older people. From 23 interviews, main reasons for use perceived ZWIP to be a good, quick, and easy way of communicating with providers and the presence of active health problems. Important reasons for non-use were lack of computer skills and preferring traditional means of consultation.	the POHC intervention used the POHC frequently. For implementation of personal online health communities, older people with active health problems and a sizable number of health care providers should be targeted, and the informal caregiver, if present, should be involved in the implementation process.	it for quick and easy communication if problems arose.

et Research, 16(12). doi:10.2196/jmir.3609		caregivers, and their providers. ZWIP was developed at the Geriatrics Department of Radboud University Medical Center. We collected data on POHC use for 2 years.			
McCarthy, D., Engel, K., Buckley, B. Forth, V., Schmidt, M., Adams, J., & Baker, D. (2012) Emergency department discharge instructions: Lessons learned throu	Research	Emergency department discharge instructions: Lessons learned through developing new patient education materials.	Our multidisciplinary team developed a new set of discharge instructions for five common emergency department diagnoses using recommended tools for creating literacy-appropriate and patient-centered education materials.	We found that the recommended tools for document creation were essential in constructing the new instructions. However, while the tools were necessary, they were not sufficient.	Need more educational tools

gh developing new patient education materials. Emergency Medicine International. 60(2): 152–159. doi: 10.1155/2012/306859.					
McKibbon, K. A., Lokker, C., Handler, S. M., Dolovich, L. R., Holbrook, A. M., O'Reilly, D., & Raina, P.	Research article reviews		428 articles studied. Those articles that did address economics and clinical outcomes often showed equivocal findings on the effectiveness and cost-effectiveness of MMIT systems. Qualitative studies provided evidence of strong perceptions, both positive and negative, of the effects of MMIT and unintended consequences. holds the promise of improved processes;		Health portal medication management helpful

(2011). Report: Enabling medication management through health information technology (Health IT). Evidence Report/Technology Assessment, 201, 1-951.					
Miller Jr, D. P., Latulipe, C., Melius, K. A., Quandt, S. A., & Arcur		The United States government is encouraging physicians to adopt patient portals—secure websites that allow patients to access their health information. For patient portals	Methods: We performed in-depth interviews between October 2013 and June 2014 with 20 clinic personnel recruited from health centers in four North Carolina counties. Trained study personnel conducted individual interviews following an interviewer guide to elicit perceptions of the	Results: The interviews revealed that clinic personnel viewed patient portals as a mandated product that had potential to	

y, T. A. (2016). Primary Care Providers' Views of Patient Portals: Interview Study of Perceived Benefits and Consequences. *Journal of Medical Internet Research*, *18*(1), e8.		to recognize their full potential and improve patient care, health care providers' acceptance and encouragement of their use will be essential. However, little is known about provider concerns or views of patient portals. Objective: We conducted this qualitative study to determine how administrators, clinic staff, and health care providers at practices serving a lower income adult population viewed patient portals in terms of their potential benefit, areas of concern, and hopes for the future.	benefits and disadvantages of patient portals. Interviews were recorded and transcribed. Research team members reviewed transcribed interviews for major themes to construct a coding dictionary. Two researchers then coded each transcript with any coding discrepancies resolved through discussion.	improve communication and enhance information sharing. However, they expressed many concerns including portals' potential to generate more work, confuse patients, alienate non-users, and increase health disparities. Clinic personnel expected few older and disadvantaged patients to use a portal. Conclusions: Given that clinic personnel have significant concerns about portals' unintended consequen	

				ces, their uptake and impact on care may be limited. Future studies should examine ways portals can be implemented in practices to address providers' concerns and meet the needs of vulnerable populations.	
Mold, F., & de Lusignan, S. (2015). Patients' Online Access to Their Primary Care Electronic Healt		In the UK, patient online access [5] has been successfully piloted [6], but not widely adopted beyond appointments and repeat prescriptions [7]. The successes seen in pilots of more extensive online services have yet to be more widely replicated. Progress to date has been limited	This review identifies new and recurring themes about online record access and services for research and practice. Much of the research into online access and services suggested that clinicians are concerned about the potential effect on workload. While several studies reported an increase in workload , other studies reported a large but temporary increase that plateaued in time . Other studies described a decline in workload .Studies report differing impacts on	Explanations of low uptake beyond appointment booking, appointment reminders, and repeat prescription requests by UK patients, and lack of enthusiasm by health care professionals has not helped.	

h Records and Linked Online Services: Implications for Research and Practice. Journal of personalized medicine, 5(4), 452-469.		by professional concerns about security and privacy [8,9,10], legal constraints [11], and low uptake [12].	routine face-to-face consultations. Some report a decline in attendance , some an increase in attendance, and others no change . Other forms of contact, such as email or web-messaging, may create a new and increased volume of contacts , while others report no change. There was also an inconsistent impact on telephone contact; this may rise and then fall back when new services are offered. Other studies reported no change in telephone volume , and a few described an increase. There was little research of clinicians' use of email to communicate with their patients; what research exists indicates that only a minority of clinicians (between 3% and 17%) regularly used email for this purpose . Use of email to manage conditions was largely limited to problems that were manageable using this medium . However, more complex problems were not suitable for this method of communication . Online services have been perceived as fundamentally changing the organization of care, and implementation	This may be grounded in the lack of high quality evidence available. Evidence is needed about how to incorporate online access into quality of care, or how online services might positively impact health outcomes. Regardless, online access is here to stay, and will grow over time. In the UK there is a need for a changed business model that promotes the use of online services, with the goal that once implement	

			meant the re-organization of working practices . Clinicians changed the way they wrote their medical records once they started to share these with the patient . The nature of communication may also change. Changes included the tone, content, directness of the condition under discussion, and even a subtle shift in the balance of power in favor of the patient . The rise of email appointment reminder systems in primary care decreased rates of failure to attend appointments. The actual mode used to send the reminder was also important, some patients preferred email and others text messages . A number of novel technologies had been introduced but not widely adopted: Links to X-ray and scan images ; Automated tracking of test results ; Text messaging question answering and answering machine services [140]; Portals that can use codes or pictures of medications to avoid medication names being displayed [30]; Web-based triage systems [24]. Computerized medical	ed, this may fundamentally change the business process in primary care, empower patients, and result in safer practice. With careful development, these services may be successfully incorporated into the organization of primary care.	

			record systems may need to change to become more patient-friendly. This may, in the long term, enable patients to be more effective in self-management and involved in decision-making. Linking knowledge and information into online services may complement existing care in terms of changing the way clinicians communicate with patients and may indicate new ways to implement appointment reminder systems. Online access and services may change the nature of the patient-clinician interaction. Clinical and practice training may need to change to include effective communication; learning new styles and modes of communication. Clinicians also need to learn how it is possible to provide online access without being overwhelmed by online requests. Examination of users' acceptance of online services and access, prior to implementation may provide insight into long-term sustainability. The re-design of services may need to be done so that it results in more accessible		

			provision, which lessens current disparities. A business model that enables resources to follow the more efficient provision of additional online services. Technological advancements need to incorporate the following: How the design of online record access may impact effective adoption and use of these technologies for different patient groups. How health care teams are best trained and assisted to support patients' use of ever-changing technologies. How new systems can be integrated into the existing technological infrastructure and workflows. Whether these technologies are efficient and cost-effective. Whether the development of new systems can consider patient preferences, as different modes of contact (e.g., email) may alter user adoption and use. Ultimately, what circumstances and what forms of communication work best for patients and practitioners. Finally, although clinicians reported that ensuring privacy was of paramount importance, some patient evidence		

			supported the view that they were willing to trade security for ease of access.		
Murray, M. F., Giovanni, M. A., Klinger, E., George, E., Marinacci, L., Getty, G., & Haas, J. S. (2013). Comparing electronic health record portals to obtain patient-entered family health history in primary care.	Research	Patients were enrolled from four primary care practices and were asked to collect family health history before a physical exam using either telephone-based interactive voice response (IVR) technology, a secure Internet portal, or a waiting room laptop computer, with portal assigned by practice. Intervention practices were compared to a "usual care" practice, where there was no standard workflow to document family history (663 participants in the three intervention arms were compared to 296 participants from the control practice).	Key Results: Demographics varied by clinic. Documentation of new family history data was significantly higher, but modest, in each of the three intervention clinics (7.5 % for IVR clinic, 20.3 % for laptop clinic, and 23.1 % for patient portal clinic) versus the control clinic (1.7 %). Patient-entered data on common conditions in first degree relatives was confirmed as valid by a genetic counselor for the majority of cases (ranging from 64 to 82 % in the different arms).	Conclusions: Within primary care practices, valid patient entered family health history data can be obtained electronically at higher rates than a standard of care that depends on provider-entered data. Further research is needed to determine how best to match different portals to individual patient preference, how the tools can best be integrated with provider workflow,	Health portals help with entering patients history, screening and prevention reminders.

Journal of General Internal Medicine, 28(12), 1558-1564. doi:10.1007/s11606-013-2442-0		Main Measures: New documentation of any family history in a coded EHR field within 30 days of the visit. Secondary outcomes included participation rates and validity.		and to assess how they impact the use of screening and prevention	
Nagykaldi, Z., Aspy, C., Chou, A., & Mold, J. (2012). Impact of a wellness portal on the delivery of patient-centered preventive care.	Research	The objective of this study was to determine the impact of the Wellness Portal--a novel, web-based patient portal that focuses on wellness, prevention, and longitudinal health--on the delivery of patient-centered preventive care by examining the behavior and experiences of both patients and primary care clinicians and the degree to which recommended services were	Results: Ninety percent of patients in the pilot study found the portal easy to use, 83% found it to be a valuable resource, and 80% said that it facilitated their participation in their own care. The cluster randomized controlled trial included 422 adults 40 to 75 years of age and the parents of 116 children 2 to 5 years of age. Seventy three percent of patients used the portal during the study. Both patient activation (measured via the 13-item Patient Activation Measure) and participants' perception of patient-centeredness of care (measured via the Consumer Assessment of Healthcare Providers and	Conclusions: A comprehensive patient portal integrated into the regular process of primary care can increase the patient-centeredness of care, improve patient activation, enhance the delivery of both age- and risk factor-appropriate preventive	Health portals help with patient centered care. preventative, low dose aspirin, pneumovax and have less medical visits. children had all recommended immunizations

Journal of the American Board of Family Medicine, 25(2), 158-167.		individualized and provided. Methods: We conducted a 3-year, systematic portal development and testing study, which included a 6-month feasibility and acceptability pilot in 2 primary care practices followed by a 12-month cluster randomized controlled trial in 8 clinician practices (4 in each study group). Descriptive and bivariate analyses were conducted to compare service delivery between intervention and control arms.	Systems instrument) increased significantly in the portal group compared with control (P = .0014 and P = .037, respectively). A greater proportion of portal users received all recommended preventive services (84.4% intervention vs 67.6% control; P < .0001); took low-dose aspirin, if indicated (78.6% intervention vs 52.3% control; P < .0001); and received Pneumovax because of chronic health conditions (82.5% vs 53.9%; P < .0001) and age (86.3% vs 44.6%; P < .0001), despite having fewer visits over the study period compared with those in the control group (average of 2.9 vs 4.3 visits; P < .0001). Children in the intervention group received 95.5% of all recommended immunizations compared with 87.2% in the control group (P = .044).	services, and promote the utilization of web-based personal health records.	
Osseboaard, H. C., Seydel, E. R., & van Gemert-Pijnen	Research	The portal is used by over 4 million visitors in 2010. Among them, an increasing amount of patients that use the portal for information and	Results: The search strategy mostly used (65%) by the relatively well-educated subjects is 'orienteering'. Users with long-term conditions and their careers expect tailored support from a national health portal, to help them navigate,	A non-representative composition of a small nonrandom judgment sample does not	Health portal used to help with decision making, and long

, L. (2012). Online usability and patients with long-term conditions: A mixed-methods approach. International Journal of Medical Informatics, 81(6), 374-387. doi:10.1016/j.ijmedinf.2011.12.010		decision making on medical issues, healthy living, health care providers and other topics. Objective: First objective is to examine what usability aspects of the portal matter for chronic patients and their informal regard to information seeking, self-management, decision making, on line health information and other variables. Second objective is to make evidence-based practical recommendations for usability improvement. Methods: An innovative combination of techniques (semi-structured interviews; eHealth Literacy scale; scenario-based study using think-aloud protocol and screen capture software; focus	search and find the detailed information they need. They encounter serious problems with these usability issues some of which are disease-specific. Patients indicate a need for personalized information. They report low impact on self-management and decision making. Overall judgment of usability is rated 7 on a Likert type 0-10 scale. Based on the outcomes recommendations could be formulated. These have led to major adaptations to improve usability.	permit generalization to other populations and cognitive bias cannot be quantified. However if mixed methods are applied valid conclusions can be drawn with regard to usability issues.	term chronic problems such as arthritis, asthma and diabetes.

		group) is used to study usability and on line information seeking behavior in a non-random judgment sample of three groups of patients (N=21) with long-term medical conditions (arthritis, asthma and diabetes).			
Otte-Trojel, T., de Bont, A., van de Klundert, J., & Rundall, T. G. (2014). Characteristics of patient portals developed in the context of	Research	In response to the EHR Incentive Program, some Health Information Exchanges in the United States are developing patient portals and offering them to their network of providers. Such patient portals hold high value for patients, especially in fragmented health system contexts, due to the portals' ability to integrate health information from an array of providers and	Results: Our findings suggest that there are two primary types of patient portals available to providers in HIEs: (1) portals linked to EHRs of individual providers or health systems and (2) HIE-sponsored portals that link information from multiple providers' EHRs. The decision of providers in the HIEs to adopt either one of these portals appears to be a trade-off between functionality, connectivity, and cost. Our findings also suggest that while the EHR Incentive Program is influencing these decisions, it may not be enough to drive adoption. Rather, patient demand for access to patient portals will be necessary to achieve	Conclusions: Optimizing patient value should be the main principle underlying policies intending to increase online patient engagement in the third stage of the EHR Incentive Program. We propose a number of features for the EHR Incentive Program that will	Health portals help with engagement of care and will help meet the meaningful use 3 guidelines.

health information exchanges: Early policy effects of incentives in the meaningful use program in the United States. Journal of Medical Internet Research, 16(11). doi:10.2196/jmir.3698		give patients one access point to this information. Our aim was to report on the early effects of the EHR incentives on patient portal development by HIEs. Methods: We identified four HIEs that were developing patient portals as of spring 2014. We collected relevant documents and conducted interviews with six HIE leaders as well as two providers that were implementing the portals in their practices. We performed content analysis on these data to extract information pertinent to our study objectives.	widespread portal adoption and realization of potential benefits.	enhance patient value and thereby support the growth and sustainability of patient portals provided by Health Information Exchanges.	
Paschal, D. (2012). Launching					

complex medical workups from an urgent care platform. Annals of Internal Medicine, 156(3), 232-233. doi:10.7326/0003-4819-156-3-201202070-00012					
Piette, J. D., Marinec, N., Janda, K., Morgan, E., Schantz, K., Aruquipa Yujra,	Research	Materials and Methods: Patients with diabetes and/or hypertension were identified through ambulatory clinics affiliated with four hospitals. All patients enrolled with a CarePartner.	Results: The 72 participants included 39 with diabetes and 53 with hypertension, of whom 19 had ≤6 years of education. After 1,225 patient-weeks of attempted IVR assessments, the call completion rate was higher among patients randomized to m-health+CP compared with standard m-health	Conclusions: In this study we found that caregiver feedback increased engagement in m-health and may improve patients' health	Health portal helped with diabetes and hypertension along with engagement.

A. C., &Aikens, J. E. (2015). Structured caregiver feedback enhances engagement and impact of mobile health support: A randomized trial in a lower-middle-income country. Telemedicine Journal and E-Health: The		Patients were randomized to weekly IVR calls including self-management questions and self-care education either alone ("standard m-health") or with automated feedback about health and self-care needs sent to their CarePartner after each IVR call ("m-health+CP").	(62.0% versus 44.9%; $p < 0.047$). CarePartner feedback more than tripled call completion rates among indigenous patients and patients with low literacy ($p < 0.001$ for both). M-health+CP patients were more likely to report excellent health via IVR (adjusted odds ratio [AOR] = 2.60; 95% confidence interval [CI], 1.07, 6.32) and less likely to report days in bed due to illness (AOR = 0.42; 95% CI, 0.19, 0.91).	status relative to standard approaches. M-health+CP represents a scalable strategy for increasing the reach of self-management support in LMICs.	

Official Journal of the American Telemedicine Association. 5(4):470-482.					
Pinnock, H., & Thomas, M. (2015). Does self-management prevent severe exacerbations? Current Opinion in Pulmonary Medicine, 21(1). doi:10.1097/MCP.	Article		All clinicians treating patients with asthma should be supporting their patients to understand and manage their own condition. Optimal selfmanagement, incorporates education, provision of a personalized asthma action plan and is supported by regular professional review. Action plans in a written or digital format should advise on recognizing deterioration and the actions to take, including when to seek professional help, appropriate changes in medication dose or commencing rescue oral steroids. Action plans should be personalized and agreed by the patient, and provided in a culturally tailored form.		

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Riippa, I., Linna, M., Rönkkö, I., & Kröger, V. (2014). Use of an electronic patient portal among the chronically ill: An observational study. Journal of Medical Internet Research, 16(12). doi:10.2196/jmir.3722	Research	A total of 222 chronically ill patients, who were offered access to a patient portal with their health records and secure messaging with care professionals, were included in the study. Differences in the characteristics of non-users, viewers, and interactive users of the patient portal were analyzed before access to the portal. In addition, patient-reported health and patient activation were assessed by a survey.	Results: Despite the broad range of measures used to indicate the patients' state of health, the portal user groups differed only in their recorded diagnosis for hypertension, which was most common in the non-user group. However, there were significant differences in the amount of care received during the year before access to the portal. The non-user group had more nurse visits and more measurements of relevant physiological outcomes than viewers and interactive users. They also had fewer referrals to specialized care during the year before access to the portal than the two other groups. The viewers and the interactive users differed from each other significantly in the number of nurse calls received, the interactive users having more calls than the viewers. No significant differences in age, gender, or patient activation were detected between the user groups.	Conclusions: Previous care received by the patient is an important predictor for the use of a patient portal. In a group of patients with a similar disease burden, demand for different types of health services and preferences related to the service channel seem to contribute to the choice to use the patient portal.	Health portal helped with less provider visits and better physiological outcomes.

Robben, S. M., Perry, M., Huisjes, M., van Nieuwenhuijzen, L., Schers, H. J., van Weel, C., … Melis, R. F. (2012). Implementation of an innovative web-based conference table for community-dwelling frail older people, their infor	Research	Due to fragmentation of care, continuity of care is often limited in the care provided to frail older people. Further, frail older people are not always enabled to become involved in their own care. Therefore, we developed the Health and Welfare Information Portal (ZWIP), a shared Electronic Health Record combined with a communication tool for community-dwelling frail older people and primary care professionals. This article describes the process evaluation of its implementation, and aims to establish (1) the outcomes of the implementation process, (2) which	Results: 290 frail older people and 169 professionals participated in the ZWIP. At the end of the implementation period, 55% of frail older people and informal caregivers, and 84% of professionals had logged on to their ZWIP at least once. For professionals, the exposure to the implementation strategies was generally as planned, they considered the interprofessional educational program and the helpdesk very important strategies. However, frail older people's exposure to the implementation strategies was less than intended. Facilitators for the ZWIP were the perceived need to enhance interprofessional collaboration and the ZWIP application being user-friendly. Barriers included the low computer-literacy of frail older people, a preference for personal communication and limited use of the ZWIP by other professionals and frail older people. Interviewees recommended using the ZWIP for other target populations as well and adding further strategies that may help frail older	Conclusions: This study describes the implementation process of an innovative e-health intervention for community-dwelling frail older people, informal caregivers and primary care professionals. As e-health is an important medium for overcoming fragmentation of healthcare and facilitating patient involvement, but its adoption in everyday practice remains a challenge, the positive results of	Health portal helped with older patients and communication along with their caregivers and healthcare providers to provide nonfragmented care.

mal caregivers and professionals: A process evaluation. BMC Health Services Research, 12(251), 1-12. doi:10.1186/1472-6963-12-251		implementation strategies and barriers and facilitators contributed to these outcomes, and (3) how its future implementation could be improved. Methods: Mixed methods study, consisting of (1) a survey among professionals (n = 118) and monitoring the use of the ZWIP by frail older people and professionals, followed by (2) semi-structured interviews with purposively selected professionals (n = 12).	people to feel more comfortable with computers and the ZWIP.	this implementation are promising.	
Robeznieks, A. (2015). Retail stores become outpatient centers. Modern	Article		30% of urgent care visitors require primary care follow up visit while 10-15% need to see an orthopedic specialist. specialist comes to urgent care clinic once a week. capture as much of the primary care market as you possibly can. helps to assign a primary care doctor to a patient. leads to better health management and influences where people		

Healthcare, 45(11).			go for elective choices.		
Ronda, M. M., Dijkhorst-Oei, L., & Rutten, G. M. (2014). Reasons and barriers for using a patient portal: survey among patients with diabetes mellitus. Journal Of Medical Internet Resea	Research	We conducted a survey among patients with type 1 and type 2 diabetes mellitus from 62 primary care practices and 1 outpatient hospital clinic in the central area of the Netherlands who all used the same electronic health record with a Web portal. Questionnaires about patient characteristics, opinions about reasons for use or nonuse, and about portal content were sent to 1500 patients with a login and 3000 patients without a login to the Web portal. Patient groups were stratified according to login frequency. Demographic and diabetes-related variables were analyzed with	Results: The total response rate was 66.63% (2391/4399); 1390 of 4399 patients (31.60%) were eligible for analysis. There were 413 regular users (login frequency more than once) and 758 nonusers (no login). Most nonusers (72.4%) stated that the main reason for not requesting a login was that they were unaware of the existence of the portal. Other barriers reported by patients were disinterest in managing their own disease (28.5%, 216/758) and feelings of inadequacy with the use of computers and Internet (11.6%, 88/758). Patients treated by a general practitioner were more frequently nonusers compared to patients treated by an internist (78.8%, 666/846 vs 28.3%, 92/325; P<.001) and more users than nonusers became aware of the Web portal through their physician (94.9%, 392/413 vs 48.8%, 102/209; P<.001). Nonusers perceived specific portal content as not as useful as regular users did,	Conclusions: Our study shows that unawareness of the patient portal is the main barrier of enrollment. Users and nonusers perceive the usefulness of the portal differently and do not have the same recommendations for additional functionalities. To increase patients' participation in a Web portal, the unawareness of its existence and its possibilities need to be addressed by their	Health portal helped with engagement of care including keeping up with lab values, messaging, glucose levels.

rch, 16(11), e263. doi:10.2196/jmir.3457		multivariable regression analysis.	especially access to laboratory values (71.7%, 383/534 vs 92.3%, 372/403), rereading clinic visits (61.3%, 320/522 vs 89.6%, 360/402), e-messaging (52.0%, 262/504 vs 74.6%, 299/401), and uploading results to the glucose diary (45.3%, 229/506 vs 74.0%, 288/400; all P<.001).	health care professionals.	
Schnipper, J. L., Gandhi, T. K., Wald, J. S., Grant, R. W., Poon, E. G., Volk, L. A., & Middleton, B. (2008). Design and implementation of a web-based patien	Research	In this article we describe the medications module within Patient Gateway (PG), a patient portal linked to an electronic health record (EHR). The medications module is designed to improve the accuracy of medication lists within the EHR, reduce adverse drug events and improve patient-provider communication regarding medications and allergies in several primary care practices. This module allows patients to view and	Of these, 1131 patients (78%) opened a medications journal and 1053 (72%) completed the review and updating process and submitted a journal for review. Data were reviewed electronically within the LMR for 812 (77%) of these patients. In addition, 687 consented patients who opened their invitation to complete a medication journal prior to a visit were further invited to complete a brief survey of their journal experience three days after their visit. Of these patients, 466 (68%) responded (Table 2). Overall, 70% of these patients found the journal very easy or easy to complete. Fifty-three percent either strongly agreed or agreed that the use of the journal led	Usage and satisfaction data indicate that patients found the module easy to use, felt that it led to their providers having more accurate information about them and enabled them to feel more prepared for their visits. Further analyses will determine the effects of this	Health portal helped with medications , monitoring blood pressure and communication

t portal linked to an electronic health record designed to improve medication safety: The patient gateway medications module. Informatics in Primary Care, 16(2), 147-155.		modify the list of medications and allergies from the EHR, report non-adherence, side effects and other medication-related problems and easily communicate this information to providers, who can verify the information and update the EHR as needed.	their providers to have more accurate information about them, while 39% felt neutral about the journal's impact in this area. Similarly, 56% of respondents strongly agreed or agreed that they felt more prepared for their visit with the use of the journal, while 35% reported that they felt neutral about the journal's impact on feelings of preparedness.	module on important medication-related outcomes and identify further enhancements needed to improve on this approach. Medication non-adherence can lead to poor control of chronic diseases such as hypercholesterolemia, diabetes, hypertension and heart failure. Causes of non-adherence include the high cost of medications, the inconvenience of taking daily medications and obtaining refills, and	

				lack of appreciation for medication indications, especially for asymptomatic conditions such as hypertension.	
Scott, D. R., Batal, H. A., Majeres, S., Adams, J. C., Dale, R., & Mehler, P. S. (2009). Access and care issues in urban urgent care clinic patients. BMC Health Services	Research	We conducted a cross-sectional survey of patients seeking care at an urgent care clinic (UCC) within a large acute care safety-net urban hospital over a six-week period. Survey data included demographics, social and economic information, reasons that patients chose a UCC, previous primary care exposure, reasons for delaying care, and preventive care needs.	Results: A total of 1, 006 patients were randomly surveyed. Twenty-five percent of patients identified Spanish as their preferred language. Fifty-four percent of patients reported choosing the UCC due to not having to make an appointment, 51.2% because it was convenient, 43.9% because of same day test results, 42.7% because of ability to get same-day medications and 15.1% because co-payment was not mandatory. Lack of a regular physician was reported by 67.9% of patients and 57.2% lacked a regular source of care. Patients reported delaying access to care for a variety of reasons.	Conclusion: Despite a common belief that patients seek care in the urgent care setting primarily for economic reasons, this study suggests that patients choose the urgent care setting based largely on convenience and more timely care. This information is especially applicable to the potential	Urgent care center used for primary care.. why

Research, 9:222. doi:10.1186/1472-6963-9-222				increase in urgent care volume in a universal healthcare system. Additionally, this study adds to the body of literature supporting the important role of timely primary care in healthcare maintenance.	
Sharma, N., Tridimas, A., & Fitzsimmons, P. R. (2014). A readability assessment of online stroke information. Journ	Research	Patients and carers increasingly access the Internet as a source of health information. Poor health literacy is extremely common and frequently limits patient's comprehension of health care information literature. We aimed to assess the readability of online consumer-orientated stroke	None of the included Web pages complied with the current readability guidelines when readability was measured using the gold standard SMOG formula. Mean Flesch-Kincaid grade level was 10.4 (95% confidence interval [CI] 9.97-10.9) and mean SMOG grade 12.1 (95% CI 11.7-12.4). Over half of the Web pages were produced at graduate reading levels or above. Not-for-profit Web pages were significantly easier to read (P=.0006). The Flesch-Kincaid formula significantly underestimated reading difficulty, with a mean	Conclusions: Most consumer-orientated stroke information Web sites require major text revision to comply with readability guidelines and to be comprehensible to the average patient. The Flesch-Kincaid	Websites and poor literacy levels

al of Stroke and Cerebrovascular Diseases: The Official Journal of National Stroke Association, 23(6), 1362-1367. doi:10.1016/j.jstrokecerebrovasdis.2013.11.017		information using 2 validated readability measures. 100 highest Google webpages used.	underestimation of 1.65 grades (95% CI 1.49-1.81), P<.0001.	formula significantly underestimates reading difficulty, and SMOG should be used as the measure of choice.	
Shaw, R. J., & Ferranti, J. (2011). Patient-provider internet portal	Research	An important emerging information technology tool is the electronic health record with a patient-provider Internet portal. Patient-provider Internet portals offer a venue for providing patient access to	Data from this study suggest that a significant portion of patients (29.7%) with diabetes utilize the portal. Clinical outcome results indicated that portal use was not a significant predictor of low-density lipoprotein and total cholesterol levels. However, portal use was a statistically significant predictor of glycosylated hemoglobin	Patient-provider Internet portals have the ability to provide patients with the opportunity to be increasingly involved in their	Health portal and diabetes helped with A1C level reduction engagement, and commu

s--patient outcomes and use. Computers, Informatics, Nursing: CIN, 29(12), 714-718. doi:10.1097/NCN.0b013e318224b597		personal health data. In this study, we conducted a cross-sectional secondary data analysis to describe the types of diabetes patients who utilize the patient-provider Internet portal and examine any preliminary differences in patient outcomes.	(HbA1c) (P < .001). As patient-provider Internet portals are increasingly implemented and utilized across the nation, both clinical and nonclinical impacts must be evaluated.	own care, enhance patient-provider communication, and potentially reduce inequity, improve clinical outcomes, and increase access to care.	nication.
Shoemaker, S., Wolf, M., & Brach, C. (2013)Patient education materials assessment tool for printa	Tool	To develop a reliable and valid instrument to assess the understandability and actionability of print and audiovisual materials. Methods We compiled items from existing instruments/guides that the expert panel assessed for	Tool for educational material review Results The experts deemed the PEMAT items face/content valid. Four rounds of reliability testing and refinement were conducted using raters untrained on the PEMAT. Agreement improved across rounds. The final PEMAT showed moderate agreement per Kappa (Average K = 0.57) and strong agreement per Gwet's AC1 (Average = 0.74). Internal	The PEMAT can help professionals judge the quality of materials	

ble materials (PEMAT-P). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from www.ahrq.gov/professionals/prevention-chronic-care/improve/self-mgmt/pemat/index.html		face/content validity. We completed four rounds of reliability testing, and produced evidence of construct validity with consumers and readability assessments.	consistency was strong (α = 0.71; Average Item-Total Correlation = 0.62). For construct validation with consumers (n = 47), we found significant differences between actionable and poorly-actionable materials in comprehension scores (76% vs. 63%, $p < 0.05$) and ratings (8.9 vs. 7.7, $p < 0.05$). For understandability, there was a significant difference for only one of two topics on consumer numeric scores. For actionability, there were significant positive correlations between PEMAT scores and consumer-testing results, but no relationship for understandability. There were, however, strong, negative correlations between grade-level and both consumer-testing results and PEMAT scores.		
So, P., & Lin, S. Y. (2015).	Research	Documentation and treatment of hypertension: Quality of care and missed opportunities in	262/1011 (26%) of adult patients had elevated blood pressure at time of visit. Of those, 115/262 (44%) had documentation and a	Conclusions: Fewer than half of visits of patients with	Health portal helped with elevated blood

Documentation and treatment of hypertension: Quality of care and missed opportunities in a family medicine resident clinic. Postgraduate Medical Journal, 91(1071), 30-34. doi:10.1136/postgradmedj-2013-132520		a family medicine resident clinic. Study designs A cross-sectional chart review of 1011 adult patient visits.	plan for treatment, 79/262 (30%) had documentation but no plan, and 68/262 (26%) had neither documentation nor plan. Nationally, 45% of patients are diagnosed and treated compared with 44% of study visits with documentation and treatment.	elevated blood pressure resulted in both documentation and a treatment plan. Nevertheless, these rates are comparable to national providers. Elevated blood pressure was more likely to be missed during acute visits and in patients with less elevated blood pressure.	pressure action plan.
Tanne	Re	Impact and user	Their perceptions of	These	Promoti

ry, N. H., Epstein, B. A., Wessel, C. B., Yarger, F., LaDue, J., & Klem, M. L. (2011). Impact and user satisfaction of a clinical information portal embedded in an electronic health record. Perspectives in Health Information	se arch	satisfaction of a clinical information portal embedded in an electronic health record. A wellness survey was used to collect data from 280 youth, 16 to 20 years old, in two Western Canadian high schools.	wellness meant more to them than regular physical activity and healthy eating. The majority of youth suggested that psychological (89%), social (85%), and physical (80%) development made the most significant contribution to adolescent wellness. Slightly more than half the youth felt that spirituality (53%) contributed to their sense of wellness.	research findings indicate the need for an approach to adolescent nursing care that includes a high priority and greater visibility to the practice and philosophy of wellness.	on of wellness is needed aspect of adolescent care.

Management / AHIMA, American Health Information Management Association.					
Turvey, C., Klein, D., Fix, G., Hogan, T. P., Woods, S., Simon, S. R., & Nazi, K. (2014). Blue button use by patients to access and share health	Research	The Blue Button feature of online patient portals promotes patient engagement by allowing patients to easily download their personal health information. This study examines the adoption and use of the Blue Button feature in the Department of Veterans Affairs' (VA) personal health record portal, My HealtheVet. Materials and Methods: An online survey	Results: Of the survey participants (N=18 398), 33% were current Blue Button users. The most highly endorsed benefit was that it helped patients understand their health history better because all the information was in one place (73%). Twenty-one percent of Blue Button users with a non-VA provider shared their VA health information, and 87% reported that the non-VA provider found the information somewhat or very helpful. Veterans' self-rated computer ability was the strongest factor contributing to both Blue Button use and to sharing information with non-VA providers. When comparing Blue Button users and non-users,	Conclusions: This study contributes to the understanding of early Blue Button adoption and use of this feature for patient-initiated sharing of health information. Educational efforts are needed to raise awareness of the Blue Button and to address usability issues that	Health portal increases engagement and to understand their health history better and most shared their health data with other providers.

record information using the Department of Veterans Affairs' online patient portal. Journal of the American Medical Informatics Association: JAMIA, 21(4), 657-663. doi:10.1136/amiajnl-2014-002723		presented to a 4% random sample of My HealtheVet users between March and May 2012. Questions were designed to determine characteristics associated with Blue Button use, perceived value of use, and how Veterans with non-VA providers use the Blue Button to share information with their non-VA providers.	barriers to adoption were low awareness of the feature and difficulty using the Blue Button.	hinder adoption.	
U.S. Department	Article		Patient-centered approaches to care have been shown to improve		

of Health and Human Services (2014a) Agency for Healthcare Research and Quality: Chapter 5 Patient Centeredness (Institute of Medicine). Retrieved from http://archive.ahrq.gov/research/findings/nhqrdr/nhdr10/Chap5.html	patient centered care		patients' health status. These approaches rely on building a provider-patient relationship, improving communication, fostering a positive atmosphere, and encouraging patients to actively participate in provider-patient interactions. Patient-centered approach has been shown to lessen patients' symptom burden. Patient-centered care encourages patients to comply with treatment regimens. Patient-centered care can reduce the chance of misdiagnosis due to poor communication. Cost-Patient centeredness has been shown to reduce underuse and overuse of medical care. Patient centeredness can reduce the strain on system resources and save money by reducing the number of diagnostic tests and referrals. Although some studies have shown that being patient centered reduces medical costs and use of health service resources, others have shown that patient centeredness increases providers' costs, especially in the short run.		
U.S.	G		Guidelines for healthy		

Department of Health and Human Services(2014b). Healthy People 2020 Campaign. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/health-communication-and-health-information-technology/objectives?t	uidelines		people 2020 to use in project		

opicId=18					
U.S. Department of Health and Human Services. (2011). The Office of the National Coordinator for Health Information Technology. Retrieved from http://searchhealthit.techtarget.com/definition/ONC	Article		Health care providers must demonstrate meaningful use of a certified EHR system in order to qualify for financial incentives under the HITECH Act. Both sets of rules are open to public comment and will be finalized later in 2010, with the first awards to hospitals and eligible health care providers coming in 2011.		
U.S. Government (2015)	MAINRE		**Eligible Professional Core Objectives** (1) Use CPOE for medication orders directly entered by any		

EHR Incentive Program. Retrieved from https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html HIT.pdf	ASONFORHEALTHPORTAL		licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines. (2) Implement drug-drug and drug-allergy interaction checks. (3) Maintain an up-to-date problem list of current and active diagnoses. (4) Generate and transmit permissible prescriptions electronically (eRx). (5) Maintain active medication list. (6) Maintain active medication allergy list. (7) Record all of the following demographics: (A) Preferred language (B) Gender (C) Race (D) Ethnicity (E) Date of birth (8) Record and chart changes in the following vital signs: (A) Height (B) Weight (C) Blood pressure (D) Calculate and display body mass index (BMI) (E) Plot and display growth charts for children 2–20 years, including BMI (9) Record smoking status for patients 13 years old or older. (10) Report ambulatory clinical quality measures to CMS, or in the case of		

			Medicaid EPs, the States. (No longer core objective but still required) (11) Implement one clinical decision support rule relevant to specialty or high clinical priority along with the ability to track compliance with that rule. (12) Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies) upon request. (13) Provide clinical summaries for patients for each office visit. (14) Protect electronic health information created or maintained by the certified EHR technology through the implementation of appropriate technical capabilities. **Eligible Professional Menu Objectives** (1) Implement drug formulary checks. (2) Incorporate clinical lab-test results into EHR as structured data. (3) Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach. (4) Send patient reminders per patient		

			preference for preventive/follow-up care. (5) Provide patients with timely electronic access to their health information (including lab results, problem list, medication lists, and allergies) within 4 business days of the information being available to the EP. (6) Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient if appropriate. (7) The EP who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication reconciliation. (8) The EP who transitions their patient to another setting of care or provider of care or refers their patient to another provider of care should provide summary care record for each transition of care or referral. (9) Capability to submit electronic data to immunization registries or immunization information systems and actual submission according to applicable law and practice.		

			(10) Capability to submit electronic syndromic surveillance data to public health agencies and actual submission according to applicable law and practice.		
U.S. Government (2014) Medicare and Medicaid programs; modifications to the Medicare and Medicaid electronic health record (EHR) incentive program for 2014 and other changes to EHR	Guidelines		Guidelines for EHR from government		

incentive program; and health information technology: revision to the certified EHR technology definition and EHR certification changes related to standards. Final rule. Federal Register, 79(171), 52909-52933.					
U.S. Gover	Artic		Some EHRs may also allow you to log in to a		

nment. (2013a) Basics of Health IT. Retrieved from http://www.healthit.gov/patients-families/basics-health-it	le		web portal to view your own health record, lab results, and treatment plan, and to email your doctor.		
U.S. Government (2013b) Basics of Health IT Legislation. Retrieved from https://www.healthit.gov/policy-researchers-imple	Article		The Office of the National Coordinator for Health Information Technology's (ONC) work on health IT is authorized by the Health Information Technology for Economic and Clinical Health (HITECH) Act. The HITECH Act established ONC in law and provides the U.S. Department of Health and Human Services with the authority to establish programs to improve health care quality, safety, and efficiency through the promotion of health IT, including electronic		

menters/health-it-legislation-and-regulations			health records (EHRs) and private and secure electronic health information exchange. Other legislation related to ONC's work includes Health Insurance Portability and Accountability Act (HIPAA) the Affordable Care Act, and the FDA Safety and Innovation Act.		
U.S. National Library of Medicine. (2011). Unified Medical Language System® (UMLS®). Retrieved from http://www.nlm.nih.gov/research/umls	Article		The purpose of NLM's Unified Medical Language System® (UMLS) is to facilitate the development of computer systems that behave as if they "understand" the meaning of the language of biomedicine and health. To that end, NLM produces and distributes the UMLS Knowledge Sources (databases) and associated software tools (programs) for use by system developers in building or enhancing electronic information systems that create, process, retrieve, integrate, and/or aggregate biomedical and health data and information, as well as in informatics research.		
van Os-	Rese	To determine the cost-	Results: In total, 199 patients were included.	Conclusions: E-health	Health portal

Mede ndorp , H.; Koffij berg, H.; Eland -de Kok, P. M.; van der Zalm, A.; de Bruin - Welle r, M. S.; Pasm ans, S. A.; & Bruijn zeel-Koom en, C. M. (2012).E-health in caring for patien ts with atopic derma titis: a rando mized contro lled cost-	ar ch	effectiveness of individualized e-health compared with usual face-to-face care for children and adults with AD. Methods: A randomized controlled cost-effectiveness study from a societal perspective in adults and parents of children with moderate AD. Outcomes were quality of life, severity of AD, itching and direct and indirect costs. Data were collected at baseline and at 3 and 12 months after randomization. Linear mixed models were used to analyse clinical outcomes. After multiple imputation of missing data, costs and differences in costs were calculated over a period of 1 year.	There were no significant differences in disease-specific quality of life, severity of AD and intensity of itching between both groups at the three time points. The difference in direct costs between the intervention and control groups was €24 [95% confidence interval (CI) -360 to 383], whereas this difference was -€618 (95% CI -2502 to 1143) for indirect costs. Overall, individual e-health was expected to save €594 (95% CI -2545 to 1227) per patient in the first year of treatment, mainly through a reduction in work absenteeism. Uncertainty analyses revealed that the probability of e-health reducing costs was estimated to be ≥ 73%.	during follow-up of patients with AD is, after initial diagnosis and treatment during face-to-face contact, just as effective as usual face-to-face care with regard to quality of life and severity of disease. However, when costs are considered, e-health is likely to result in substantial cost savings. Therefore, e-health is a valuable service for patients with AD.	reduces cost of care with AD patients .

effectiveness study of internet-guided monitoring and online self-management training. The British Journal of Dermatology, 166(5), 1060-1068. doi:10.1111/j.1365-2133.2012.10829.x					
Wade-Vuturo, A. E., Mayb	Research	Secure messaging and diabetes management: Experiences and perspectives of	Results Participants were on average 57.1 years old; 65% were female; 76% were Caucasian/White, and 20% were African	Conclusion SM within a portal may facilitate access to	Health portal helps with diabetes,

erry, L. S., & Osborn, C. Y. (2013). Secure messaging and diabetes management: Experiences and perspectives of patient portal users. Journal of the American Medical Informatics Association: JAMIA, 20(3), 519-525.		patient portal users. Using mixed-methods, we explored how adults with type 2 diabetes (T2DM) use and benefit from secure messaging (SM) within a patient portal. Methods Adults with T2DM who had used a patient portal participated in a focus group and completed a survey (n=39) or completed a survey only (n=15). We performed thematic analysis of focus group transcripts to identify the benefits of and barriers to using SM within a portal. We also examined the association between use of various patient portal features and patients' glycemic control.	American/Black. Self-reported benefits of SM within a portal included enhanced patient satisfaction, enhanced efficiency and quality of face-to-face visits, and access to clinical care outside traditional face-to-face visits. Self-reported barriers to using SM within a portal included preconceived beliefs or rules about SM and prior negative experiences with SM. Participants' assumptions about providers' opinions about SM and providers' instructions about SM also influenced use. Greater self-reported use of SM to manage a medical appointment was significantly associated with patients' glycemic control ($\rho=-0.29$, $p=0.04$).	care, enhance the quality of office visits, and be associated with patient satisfaction and clinical outcomes for patients with diabetes, but provider communication about SM is essential.	messaging, appointments and had a better glycemic control.

doi:10.1136/amiajnl-2012-001253					
Wagner, P., Dias, J., Howard, S., Kintziger, K., Hudson, M., Seol, Y., & Sodomka, P. (2012). Personal health records and hypertension control: A randomized trial. Journal of the American Medic	Research	Personal health records and hypertension control: A randomized trial. METHODS: A cluster-randomized effectiveness trial with PHR and no PHR groups was conducted in two ambulatory clinics. 453 of 1686 (26.4%) patients approached were included in the analyses. A PHR tethered to the patient's electronic medical record (EMR) was the primary intervention and included security measures, patient control of access, limited transmission of EMR data, blood pressure (BP) tracking,	RESULTS: No impact of the PHR was observed on BP, patient activation, patient perceived quality, or medical utilization in the intention-to-treat analysis. Sub-analysis of intervention patients self-identified as active PHR users (25.7% of those with available information) showed a 5.25-point reduction in diastolic BP. Younger age, self-reported computer skills, and more positive provider communication ratings were associated with frequency of PHR use.	CONCLUSIONS: Few patients provided with a PHR actually used the PHR with any frequency. Thus simply providing a PHR may have limited impact on patient BP, empowerment, satisfaction with care, or use of health services without additional education or clinical intervention designed to increase PHR use.	Health portal helped with blood pressure tracking and a reduction of diastolic BP.

al Informatics Association, 19(4), 626-634. doi:10.1136/amiajnl-2011-000349		and appointment assistance. BP was the main outcome measure. Patient empowerment was assessed using the Patient Activation Measure and Patient Empowerment Scale. Quality of care was assessed using the Clinician and Group Assessment Score (CAHPS) and the Patient Assessment of Chronic Illness Care.			
Weinick, R. M., Burns, R. M., & Mehrotra, A. (2010). Many emergency department visits could be mana	Article	Many emergency department visits could be managed at urgent care centers and retail clinics.	Americans seek a large amount of nonemergency care in emergency departments, where they often encounter long waits to be seen. Urgent care centers and retail clinics have emerged as alternatives to the emergency department for nonemergency care. We estimate that 13.7-27.1 percent of all emergency department visits could take place at one of these alternative sites, with a potential cost savings of approximately $4.4 billion annually. The		Urgent care clinic as primary provider

ged at urgent care centers and retail clinics. Health Affairs Project Hope, 29(9), 1630-1636. doi:10.1377/hlthaff.2009.0748			primary conditions that could be treated at these sites include minor acute illnesses, strains, and fractures. There is some evidence that patients can safely direct themselves to these alternative sites. However, more research is needed to ensure that care of equivalent quality is provided at urgent care centers and retail clinics compared to emergency departments.		
Yoffe, S. J., Moore, R. W., Gibson, J. O., Dadfar, N. M., McKay, R. L., McClellan, D. A., & Huang, T. (2011	Research	A substantial proportion of emergency department (ED) visits by children are for non-urgent care. The objective of this research is to determine whether a parent-focused educational intervention can reduce non-urgent ED visits. Methods: A regional hospital system provided	Results: Long-term changes were observed only among the intervention group. There was a substantial and statistically significant reduction in ED use for non-urgent care of children. There was also a proportional reduction in ED charges for this group. 48% over a 6 month period.	Conclusion: An educational intervention among parents can substantially reduce non-urgent ED visits for their children.	ER as primary care clinic for pediatrics even with paper education

). A reduction in emergency department use by children from a parent educational intervention. Family Medicine, 43(2), 106-111.		monthly data retrospectively from January 2006 to October 2007 on ED visits by children. The same information was provided prospectively from November 2007 to April 2009. Starting in November 2007, a family medicine residency program affiliated with the same hospital network distributed a 6.7 grade reading level booklet on non-urgent care of children to the parents who brought their children to the outpatient clinic. The number of ED visits as a proportion of outpatient clinic visits at the residency program was calculated for each month and compared to historical and geographic			

		trends.			
Zavala, S. & Shaffer, C. (2011) Do patients understand discharge instructions? Journal of Emergency Nursing, 37(2), 138-140.	Research	Adherence to aftercare instructions following an emergency department visit may be essential for facilitating recovery and avoiding complications, but conditions for teaching and learning are less than ideal in the ED. The objective of this study was to identify and describe areas of patient confusion about ED discharge instructions. Methods: Follow-up telephone calls were made to 50 ED patients on the day after discharge to inquire how they were doing and whether they had any questions about their instructions.	Results: Fifteen subjects (31%) requested information about their aftercare instructions that required further clarification by the investigator, and 15 subjects (31%) described a diagnosis-related concern that revealed poor comprehension of instructions.	Discussion: This study demonstrated that patients commonly remain confused about aftercare information following treatment in an ED. Follow-up telephone calls may be useful for identifying and addressing ongoing learning needs.	ER discharge instructions not understood by patients

Appendix L

Patient Education Assessment

Patient Education Table

Topic	PMAT-P		SMOG	Up To Date
	Understandability	Actionability	Grade	Current EBP
Diabetes	14/19 73.68%	5/7 71.42%	10	Yes
Hypertension	14/19 73.68%	4/7 57.14%	6	Yes
Asthma	14/19 73.68%	2/5 40%	6	Yes
Otitis Media	18/19 94.73%	7/7 100%	8	Yes
Bronchitis	17/19 89.47%	5/6 83.33%	12 up	Yes

Appendix M

TAM Questionnaire Staff Results

TAM Questions Staff	Totally Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Totally Agree
1. I feel comfortable with information and communication technologies				12.5% 1		62.5% 5	25% 2
2. I know what a Health Portal is and provides for my patients	12.5% 1				25% 2	12.5% 1	50% 4
3. I think that I could easily learn how to use Health Portal	12.5% 1				12.5% 1	37.5% 3	37.5% 3
4. I think it is a good idea to use the Health Portal	25% 2			12.5% 1	12.5% 1	25% 2	25% 2
5. I have the intention to fully use all of the Health Portal functions when it becomes available in the clinic	25% 2			12.5% 1	12.5% 1	12.5% 1	37.5% 3
6. The use of the Health Portal could help me to monitor my patient's data quicker				25% 2		37.5% 3	37.5% 3
7. The use of the Health Portal may improve the monitoring of the patient's health status				25% 2	12.5% 1	37.5% 3	25% 2
8. I think it would be easy for patients to monitor health by using the Health				37.5% 3	12.5% 1	25% 2	25% 2

Portal							
9. The use of the Health Portal will make my job easier				37.5% 3	12.5% 1	37.5% 2	12.5% 1
10. By using the communication tab in the Health Portal I will be able to communicate better with my patients				50% 4		25% 2	25% 2
11. It will be easier for me to renew the patients prescriptions using the Health Portal				37.5% 3	12.5% 1	25% 2	25% 2
12. The Health Portal will promote education for the patients by providing them with access to their health care diagnosis to make it easier for them to follow advice				37.5% 3		25% 2	37.5% 3
13. The Health Portal will promote wellness by providing them with a list of their immunizations and vaccines				25% 2		37.5% 3	37.5% 3
14. I find it interesting to use the Health Portal for patient care	12.5% 1			25% 2		25% 2	37.5% 3
15. I have the intention to facilitate the use of the Health Portal to provide information to				50% 4		25% 2	25% 2

other healthcare providers							
16. I have already used a Health Portal to care for myself	25% 2			37.5 % 3		25% 2	12.5 % 1
17. The Health Portal can facilitate my patients care and make it better		12.5% 1		25% 2		37.5 % 3	25% 1
18. The use of the Health Portal is beneficial for my patients care				37.5 % 3		37.5 % 3	25% 2
19. I think I will find it easy to acquire the necessary skills to use the Health Portal at the clinic				37.5 % 3	12.5% 1	25% 2	25% 2
20. I would use the Health Portal if I had some training				25% 2	12.5% 1	25% 2	37.5 % 3
21. Other health professionals that I use would welcome the fact that I use the Health Portal				62.5 % 5	12.5% 1	12.5 % 1	12.5 % 1
22. I feel like the Health Portal will be useful to improve my patients health care and will be easy for them to use		12.5% 1	12.5% 1	25% 2		25% 2	25% 2
23. I think that the Health Portal will be easy for me to use				37.5 % 3	12.5% 1	25% 2	25% 2
24. In my opinion, the use of the Health Portal will have a positive impact on my patients health care		12.5% 1		25% 2	12.5% 1	25% 2	25% 2

25. I would facilitate the use of the Health Portal if I have access to technical assistance				37.5 % 3	12.5% 1	25% 2	25% 2
26. I often use computers in my work				25% 2		12.5 % 1	62.5 % 5

Appendix N

TAM Questionnaire Patients Results

TAM Questions Patient	Totally Disagree	Disagree	Slightly Disagree	Neither	Slightly Agree	Agree	Totally Agree
1. I feel comfortable with information and communication technologies	4.05% 3	1.35% 1	5.41% 4	13.51% 10	9.46% 7	21.62% 16	44.59% 33
2. The use of the Health Portal could help me to monitor my health care data quicker.	4.0% 3	2.67% 2	4.00% 3	8.0% 6	10.67% 8	32.24% 24	38.67% 29
3. I think that I could easily learn how to use Health Portal	4.0% 3		5.33% 4	9.33% 7	14.67% 11	22.67% 17	44.0% 33
4. I think it is a good idea to use the Health Portal	4.0% 3		4.0% 3	14.67% 11	16.0% 12	24.0% 18	37.33% 28
5. I have the intention to use Health Portal when it becomes available in my clinic	4.0% 3	2.67% 2	4.0% 3	18.67% 14	10.67% 8	25.33% 19	34.67% 26
6. The use of the Health Portal may cause major changes in my health behavior	14.67% 11	8.0% 6	4.0% 3	42.67% 32	10.67% 8	9.33% 7	10.67% 8
7. The use of the Health Portal may improve the monitoring of my health status	4.0% 3	1.33% 1	2.67% 2	22.67% 17	17.33% 13	21.33% 16	30.67% 23
8. I think it would be easy to monitor my health by using the Health Portal	4.05% 3		4.0% 3	17.33% 13	20.0% 15	18.67% 14	36.0% 27
9. I will welcome the	4.0%	1.33%	2.67%	22.67	16.0%	20.0%	33.33

use of the Health Portal	3	1	2	% 17	12	15	% 25
10. I have access to the necessary infrastructure to support my use of the Health Portal	2.67% 2	1.33% 1	5.33% 4	20.0% 15	12.0% 9	18.67 % 14	40.0% 30
11. Using the Health Portal could help me get the most out of healthcare services by using it	4.0% 3		5.33% 4	26.67 % 20	14.67 % 11	14.67 % 11	34.67 % 26
12. I believe that the website in the Health Portal would be clear and easy to understand	2.67% 2	4.0% 3	2.67% 2	21.33 % 16	21.33 % 16	21.33 % 16	26.67 % 20
13. I think that the Health Portal is flexible technology that is easy to interact with	2.67% 2	4.0% 3	4.0% 3	26.67 % 20	17.33 % 13	17.33 % 13	28.0% 21
14. I find it interesting to use the Health Portal for my medical information and care	4.0% 3	2.67% 2	6.67% 5	21.33 % 16	17.33 %13	18.67 % 14	29.33 % 22
15. I have the intention to use the Health Portal when necessary to provide information to other healthcare providers	4.05% 3	1.33% 1	8.0% 6	16.0% 12	16.0% 12	20.0% 15	34.67 % 26
16. I have already used a Health Portal to care for myself	22.67 % 17	14.67 % 11	5.33% 4	22.67 % 17	6.67% 5	8.0% 6	20.0% 15
17. The Health Portal can facilitate my care and make it better	6.67% 5	1.33% 1	5.33% 4	34.67 % 26	17.33 % 13	9.33% 7	25.33 % 19

18. The use of the Health Portal is beneficial for my care	6.67% 5	1.33% 1	4.0% 3	28.0% 21	14.67 % 11	16.0% 12	29.33 % 22
19. I think I will find it easy to acquire the necessary skills to use the Health Portal	2.67% 2	2.67% 2	4.0% 3	18.67 % 14	13.33 % 10	25.33 % 19	33.33 % 25
20. I would use the Health Portal if I had some training	4.0% 3		6.67% 5	24.0% 18	16.0% 12	20.0% 15	29.33 % 22
21. Other health professionals that I use would welcome the fact that I use the Health Portal	2.67% 2	2.67% 2	4.0% 3	34.67 % 26	13.33 % 10	12.0% 9	30.67 % 23
22. I feel that the Health Portal will be useful to improve my health care	4.0% 3	1.33% 1	5.33% 4	34.67 % 26	9.33% 7	16.0% 12	29.33 % 22
23. I have the intention to use the Health Portal on a regular basis	4.0% 3	4.0% 3	6.67% 5	33.33 % 25	10.67 % 8	17.33 % 13	24.0% 18
24. Using the Health Portal will stop me from using another provider to follow up with	8.0% 6	2.67% 2	5.33% 4	40.0% 30	12.0% 9	10.67 % 8	21.33 % 16
25. I think that the Health Portal will be easy to use	4.0% 3	1.33% 1	5.33% 4	21.33 % 16	18.67 % 14	18.67 % 14	3.67% 23
26. In my opinion, the use of the Health Portal will have a positive impact on my health care	4.0% 3	1.33% 1	4.0% 3	28.0% 21	17.33 % 13	13.33 % 10	32.0% 24
27. I would use the Health Portal if I have access to technical	4.0% 3	1.33% 1	5.33% 4	28.0% 21	12.0% 9	21.33 % 16	28.0% 21

assistance							
28. I often use computers in my work	5.33% 4	8.0% 6	5.33% 4	17.33 % 13	6.67% 5	14.67 % 11	42.67 % 32