

PROVIDERS' PERCEPTIONS AND CURRENT KNOWLEDGE ABOUT PATIENT  
PORTAL USE IN A PRIMARY CARE CLINIC IN WYOMING

by

Kelly M. Eckes

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As members of the DNP Project Committee, we certify that we have read the DNP Project prepared by Kelly M. Eckes entitled “Providers’ Perceptions and Current Knowledge About Patient Portal Use in a Primary Care Clinic in Wyoming” and recommend that it be accepted as fulfilling the DNP Project requirement for the Degree of Doctor of Nursing Practice.

\_\_\_\_\_  
Mary Davis, PhD, RN, CPHQ

Date: April 10, 2017

\_\_\_\_\_  
Christy L. Pacheco, DNP, FNP-BC

Date: April 10, 2017

\_\_\_\_\_  
Kimberly Shea, PhD, RN, CHPN

Date: April 10, 2017

Final approval and acceptance of this DNP Project is contingent upon the candidate’s submission of the final copies of the DNP Project to the Graduate College.

I hereby certify that I have read this DNP Project prepared under my direction and recommend that it be accepted as fulfilling the DNP Project requirement.

\_\_\_\_\_  
DNP Project Director: Mary Davis, PhD, RN, CPHQ

Date: April 10, 2017

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SIGNED: Kelly M. Eckes

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## DEDICATION

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## ABSTRACT

**Background:** Chronic disease is a growing problem in the United States and in Wyoming. It is associated with increased costs and increased morbidity and mortality. Technologies such as patient health portals have been shown to improve patient outcomes.

**Objective:** The objective is to promote future use of the patient portal as a tool to improve chronic disease management by identifying opportunities to increase their use.

**Design:** Using quantitative methodology, a 38-item survey was created to examine primary care providers' preexisting knowledge, attitudes, practice facilitators and barriers about patient portal use and chronic disease management.

**Setting:** A nurse owned primary care clinic in central Wyoming

**Participants:** Four nurse practitioners.

**Measurements:** The survey responses and Likert-type questions, analyzed the mode and open-ended questions analyzed through content analysis.

**Results:** The providers demonstrated an understanding of the benefits of patient portal use and its functions. It was found that although participants felt that their patients could benefit from this technology the portals were not used to their full extent.

**Conclusion:** Health care technology has provided practitioners with the ability to improve patient outcomes. Strengthening the use of patient portals and increasing the quality of how they are used has the potential to enhance patient engagement in their care, ultimately improving patient outcomes.

## **INTRODUCTION**

Chronic disease is a growing problem in the United States. Conditions such as heart disease, stroke, cancer, type 2 diabetes, obesity, and arthritis are considered to be some of the most common and costly health problems in the United States (Centers for Disease Control and Prevention (CDC), 2016a). Many of these problems can be effectively managed through provider support, patient self-involvement, and patient centered care consistent with the Institute of Medicine's (IOM) recommendations (Agency for Healthcare Research and Quality [AHRQ], 2016). Additionally, access to care is also important when it comes to promoting positive health outcomes for patients living with a chronic disease. This is of particular concern for those living in rural communities. The use of technology in healthcare is constantly evolving allowing for improved access to care. Smartphones and other portable devices are becoming a common modality that can be used to improve patient and provider communication. In fact, interventions such as text reminders have been shown to improve medication adherence among patients with suboptimal adherence to their diabetes regimens (Vervloet, van Dijk, Santen-Reestman, Van Vlijmen, Van Wingerden, Bouvy, & De Bakker, 2012). Web based tools, such as patient portals are a fairly new concept utilized in many primary care clinics and other healthcare facilities across the country. These web-based tools are used to enhance the patient-provider relationship and improve self-care management.

### **Background Knowledge**

#### **Chronic Disease**

Chronic disease plays a large burden on our nation's health. It is the cause of seven out of every 10 deaths each year and its treatment accounts for 86% of health care costs (CDC, 2016a).

In 2012, roughly half of noninstitutionalized U.S. adults suffered from one or more chronic disease (Ward, Schiller & Goodman, 2014).

Chronic disease management is defined as a combined approach to the management of illness, which includes screenings, check-ups, monitoring and coordinating treatment, and patient education (HealthCare.gov, 2016). Outcomes of adequate chronic disease management have been reported to improve quality of life while reducing and minimizing the effects of a disease (HealthCare.gov, 2016). Primary care providers and ancillary staff are critical in the management and prevention of chronic disease. Providers must remain up to date on the latest guidelines in order to provide the patient with the most updated educational tools. In order to effectively manage patients with these chronic conditions and reduce preventable hospitalizations and unfavorable events many organizations have adopted chronic disease management (CDM) programs (AHRQ, n.d.). Many of the participating organizations utilize health information technology to assist in their chronic disease management programs (AHRQ, n.d.).

### **Wyoming and Rural Health**

The state of Wyoming is located in the Rocky Mountain region of the western United States (State of Wyoming, 2013). It is the ninth largest state, but with a population of 585,501 it is considered to be the least populated state in the United States (State of Wyoming, 2013; U.S. Census Bureau, 2016). Most of the state of Wyoming is considered to be frontier or rural, leaving 200,000 residents in areas with inadequate access to primary care (Wyoming Department of Health [WDH], 2014b). Frontier areas are defined as sporadically populated areas that are isolated from population centers and services by distance or physical barriers (Rural Health Information Hub, 2015). According to the Wyoming Department of Health (2014b), 47% of the

population lives in frontier areas. In addition to insufficient access to primary care, Wyoming also lacks adequate access to dental services, leaving 205,000 residents in shortage areas (WDH, 2014b). Additionally, the state lacks adequate mental health services, identifying the entire state as designated mental health shortage area (WDH, 2014b).

In order to understand the definition of a rural community, urban areas must first be defined. There are two types of urbanized areas, those that consist of more than 50,000 people and those, which are clusters of at least 2,500 people, but have less than 50,000 people (Health Resources and Services Administration [HRSA], 2017). The term rural describes a population that incorporates housing and territory that is not considered to be in an urban area (HRSA, 2017). In 2010, 19.3% of the nation's population was considered rural (HRSA, 2017). Those living in rural communities tend to have higher poverty rates, poorer health, and higher rates of uninsured residents (HRSA, n.d.). These areas often lack provider practices, hospitals, and other health care services (HRSA, n.d.). Out of the total health care workforce, less than 10% of all physicians choose to practice in rural settings (Rural Health Information Hub, 2015). This limited access increases the need for improved patient/provider communication. Inadequate access to care and a lack of primary care providers often leads to increased emergency room visits. In fact, in 2014, 7% of adults visited the emergency room because of a lack of access to primary care providers (Gindi, Black, & Cohen, 2016). Chronic diseases such as *diabetes mellitus type 2* are most prevalent among rural communities with an estimated 17% higher incidence than urban communities (Maez, Erickson, & Naumuk, 2014).

### **Technology**

Along with the increase of chronic disease and limited access to care, the use of the

internet in U.S. households is also on the rise. Increased access to the internet opens the door for various patient education opportunities for chronic disease management. One of these opportunities is access to a patient portal. According to a survey by the U.S. Census Bureau, in 2013, 83.8% of U.S. households reported owning a computer (File & Ryan, 2014). Out of those households, 78.5% reported having a desktop or laptop computer and 63.6% reported having a handheld computer such as a smartphone. It was also found that internet use rate was greater than 50% in the age ranges of 15–34 years, 35–44 years, 45–64 years, and 65 years and older. Interestingly, 35-44 year olds reported the highest internet use at 82.5% and those 65 years and older were found to have lowest at 58.3%. Despite being mostly rural and frontier, the state of Wyoming ranks above the national average for both high-speed internet at 80.5% and computer use at 92.4% making it a viable source of patient education (File & Ryan, 2014).

Electronic health records (EHR) have helped transform the way healthcare is delivered. Government mandated regulations such as Meaningful Use have changed healthcare with the purpose of providing better outcomes, improving quality, safety, and efficiency, and reducing health disparities (HealthIT.gov, 2015a). As a part of the Health Information Technology for Economic and Clinical Health (HITECH) Act, the proposed goal is to promote interoperability of electronic health records throughout the United States (Centers for Disease Control and Prevention [CDC], 2016b). Payment by the Centers for Medicare and Medicaid Services are granted to those professionals or organizations that participate in the adoption of EHR technology. Those who did not adopt the technology prior to 2015 will see a negative impact to their Medicare/Medicaid fees (CDC, 2016b). Electronic health records are a digital version of a patient's medical record. In addition to containing a patient's medical and treatment histories,

EHRs allow the information to be transferred between various healthcare providers and facilities, which in turn, improve continuity of care (HealthIT.gov, 2013).

Patient portals are a part of the electronic health record that allows patients to view their health information using a secure website. The goal of this Meaningful Use objective is to provide patients with timely access to their health information in order to allow patients to make informed decisions about their care and share information between providers (Centers for Medicare and Medicaid Services [CMS], 2016). The ability to exchange health information between providers is key in chronic disease management. In order to meet the objective, set by CMS for the 2015 and 2016 Meaningful Use reporting period, there were two required measures, which included eligible professional (EP) measure one and two. In order to meet measure one, more than 50% of all unique patients seen by the EP during the EHR reporting period were to be provided access to view their information online. Measure two required that one patient during the reporting period not only is provided access to the portal, but also must log in and view, download or transmit their health information to a third party (CMS, 2016). In 2017, more than 5% of unique patients must log in and view, download or transmit their health information to a third party (CMS, 2016).

A patient portal offers information such as recent provider visits, discharge summaries, medications, immunizations, allergies, and lab results (HealthIT.gov, 2015b). In addition, some patient portals offer the ability to exchange secure messaging with their health care teams, request prescription refills, schedule appointments, check benefits and coverage, update demographics, pay bills, download forms, and view educational materials (HealthIT.gov, 2015b). The patient portal enables patients to become more engaged in their care.

The features associated with patient portals align with some of the concepts developed by the Agency for Healthcare Research and Quality (AHRQ) to assist providers in the support of patients and the self-management their chronic disease. These concepts include providing personalized education using materials appropriate for various cultures and health literacy levels, gathering clinical information prior to the visit, developing plans and setting and monitoring goals, and tracking outcomes (AHRQ, 2014). The use of this technology is sometimes hindered by experiences. It is important to understand providers' current knowledge, attitude, and beliefs to effectively promote positive change.

### **Local Problem**

In Wyoming, chronic disease accounts for 65% of all deaths each year (WDH, 2014a). In 2013, heart disease was the second leading cause of death and stroke was the fifth leading cause of death in the state (WDH, 2014a). In Wyoming in 2010, heart disease accounted for 22% of deaths, stroke 5% and diabetes 2% (American Heart Association & American Stroke Association, 2010). From 2011-2013 the prevalence of heart disease in Natrona County was 8.4% and diabetes 9.5% (WDH, 2016). According to the Wyoming Department of Health (WDH) (2014a), from July 2013 to June 2014, there were a total of 7,088 diabetes-related discharges from Wyoming hospitals. In 2014 alone, approximately 40,000 Wyoming residents were diagnosed with diabetes and 25,000 more were told that they had pre-diabetes (WDH, 2014a). Relative to the rest of the country, the diabetes rate increased from 4.5% in 2001 to 8.6% in 2013 (WDH, 2015). In 2014, 15.8% of Casper's population was without health insurance and in 2010, 12.9% of the population was over the age of 65 (U.S. Census Bureau, 2015).

The quality improvement project will take place at a nurse practitioner (NP) clinic in



Casper Wyoming. Casper is located in Natrona County, which is nestled in the central part of the state of Wyoming. It boasts a population of 60,285 people and is considered to be the second largest city in the state (U.S. Census Bureau, 2015) In 2010, the city covered approximately 26.90 square miles (U.S. Census Bureau, 2015). Although it is not considered rural by definition, it offers healthcare services to many of the surrounding rural communities. It is home to the regions' only level II trauma center which is also a regional referral center serving 11 Wyoming counties and 19 communities within the state (Wyoming Medical Center, 2017). Limited access to care in rural communities increases the need for providers to be well equipped with tools and information to help promote positive health outcomes with limited resources.

### **Purpose**

The purpose of this project is to assess providers' pre-existing knowledge, attitudes, and beliefs and describe practice patterns, facilitators and barriers regarding the use of patient portals as an educational tool for patient self-management of chronic disease and develop recommendations based on these needs. The aim of this project is to improve patient-provider communication about disease management by using a patient portal function of an electronic health record. The objective is to promote future use of the patient portal as a tool to improve chronic disease management by identifying opportunities to increase their use.

Improving patient portal use is not the sole responsibility of the patient; therefore, stakeholders will be an important part of this project. Relationships with stakeholders need to be developed early to avoid failure. Stakeholders can offer additional insight into the problem allowing for improved delivery of the intervention (Polit & Beck, 2012). The stakeholders for this quality improvement project will include health care providers at the primary care clinic.

### **Study Question**

What are the practice patterns, facilitators, and barriers in provider knowledge, attitudes, and beliefs about the patient health portal role in patient disease management for a primary clinic in Wyoming?

## **FRAMEWORK AND SYNTHESIS OF EVIDENCE**

### **Theoretical Framework**

Clinicians need to stay abreast of new knowledge as a part of their everyday work in order to deliver high quality care (Van De Wiel, Van den Bossche, Janssen, & Jossberger, 2011). Providers come from a vast array of previous knowledge and experience, making the usual methods of teaching inappropriate (World Health Organization, 2005). In order to increase provider knowledge regarding the patient portal and patient education, the framework that will be used to guide this DNP project is an educational theory known as the Adult Learning Theory, developed by Malcolm Shepherd Knowles. This theory, sometimes referred to as Andragogy, focuses on motivation to learn and change, which will be key in educating providers on the use of patient portals and their potential to improve patient outcomes (Grol, Bosch, Hulscher, Eccles & Wensing, 2007).

The Adult Learning Theory demonstrates that people tend to learn better and have more motivation to change when they have actually experienced the problem in practice (Grol et al., 2007). Knowles first described the Adult Learning Theory as having four key assumptions: self-concept, experience, readiness to learn, and orientation to learn (Knowles, 1996). These key assumptions are further defined by Knowles (1970). The idea of *self-concept* describes the learner as being self-directed and being able to make their own decisions while dealing with the

consequences. Adults no longer see themselves as fulltime learners, but producers and doers (Knowles, 1970). Adults often define themselves by their *experience*, and attach more meaning to the learning that they gain from experience rather than the ones they develop passively (Knowles, 1970). *Readiness to learn* requires an understanding of the need for training before the learning will take place. In order for the adult learner to become engaged in the learning process, the education should be focused on real-life tasks and problems (Knowles, 1970). Lastly, *orientation to learning* requires the training to be developed around problem solving. Unlike children, adults view education as a way of improving or coping with problems that they are currently facing, making the education more problem centered (Knowles, 1970).

The Adult Learning Theory will be useful in guiding recommendations related to providers needs to better understand the patient health portal. Adult learners need to be involved in planning and instruction of their educational experience. Education tailored around real life situations such as chronic disease management and improved patient outcomes may make the provider more apt to accepting the patient portal as a useful tool.

### **Concepts**

Concepts will be defined in order to better understand current practices and prepare providers to use patient health portals as a means of patient education. Concepts include health care providers, and provider attitudes and beliefs. Together these concepts will help in identifying the gaps in provider knowledge, attitudes and beliefs related to the patient portal and provider education, ultimately enhancing the learning experience.

The type of health care provider that will be invited to participate in this project are Nurse Practitioners (NPs). An NP is a nurse who completes a graduate education and advanced clinical

training beyond their initial registered nurse preparation, offering similar services to that of a physician (University of Minnesota, 2015).

Knowledge within the context of this project is defined as the fact of knowing something with familiarity gained through experience (Merriam-Webster, n.d.). Attitudes are favorable or unfavorable responses to objects, persons, institutions, or events (Ajzen, 2005). In relation to this project, the behavior of interest would be the provider's current patient education practices.

Attitudes are often times reasons why adults engage in learning experiences that create change (Russell, 2006). Beliefs are a person's subjective probability judgments, which deal with their understanding of themselves and their environment (Fishbein & Ajzen, 1975). Once these key concepts are defined they can further be placed within the context of the Adult Learning Theory framework for the development of an appropriate provider based educational intervention. The key assumptions described in the Adult Learning Theory are further illustrated in Table 1 as they relate to the context of the project.

TABLE 1. *Provider Learning Assumptions Based on the Adult Learning Theory*

<b>Self-Concept</b>	<b>Experience</b>	<b>Readiness to Learn</b>	<b>Orientation to Learn</b>
Reasoning behind portal use	Computer ability	Understanding benefits of portal use	Problem centered education
Self-directed learning	EHR experience	Provider engagement in learning	Identifying what motivates the provider
Able to deal with consequences	Number of years in practice	Educating providers based on real life scenarios	Problem solving

Engaging patients in their care will be promoted by utilizing the assumption of self-concept. This will be accomplished by delivering to providers the purpose behind patient portal use in regards to Meaningful Use regulations and portal functionality. Instead of an intervention

that teaches the provider how to learn, recommendations will be developed that will allow the provider to be in charge of the learning experience, making it more self-directed. Providers' past experiences including their computer ability, specialty, number years of in practice, number of years that they have spent working in a rural setting, and the amount of education that they completed will all be a part of the adult learner experience. In order for the provider to have a readiness to learn about patient portal use, they will need to be given information on how they will benefit. The providers will be oriented using problem solving revolving around disease management. Finally, identifying what motivates the provider to learn new concepts will help with adherence to the intervention.

By understanding primary care providers' current knowledge, attitudes, and beliefs about patient portal use, recommendations can be identified. The use of the Adult Learning Theory will allow for development of the steps needed to successfully enhance provider knowledge and recommend ways to improve their role in the utilization a patient health portal as an educational tool in their practice to improve chronic disease management.

### **Synthesis of Evidence**

Electronic health records have the potential to improve patient outcomes. Patient portals use a secure online website that gives patients 24-hour access to personal health information. Patients now have the ability to view health information such as recent provider visits, discharge summaries, medications, immunizations, lab results, and allergies (HealthIT.gov, 2014). The use of patient portals has been mandated by the Centers for Medicare and Medicaid Services as a part of the Meaningful Use initiative. As one of the Meaningful Use requirements, patients must be given the ability to view online, download, and transmit their health information

(HealthIT.gov, 2014). Despite its potential to improve patient outcomes, the use of the patient health portal is underutilized. In fact, according to the most recent data, only 14% of patients currently access their medical records through a doctor's office or hospital system (Wilson, Murphy, & Newhouse, 2012).

Healthcare providers are considered to be major stakeholders in patient portal implementation and play a key role in promoting their use. In order to better understand primary care providers' current knowledge, attitudes, and beliefs about portals, a search of the literature was performed using the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, and Google Scholar databases. The search was not only limited to providers but also studies evaluating health portal's benefits, which will be used to develop an educational intervention. The key terms used for the search in various combinations, included: providers, clinicians, patient portal, health portal, personal health portal, attitudes, knowledge, perceptions, and rural health. I first searched the term "patient health portal" this yielded 2,243 results. The search was filtered to only include studies within the last ten years. In order for providers to promote patient health portals, they must be able to understand their benefits; therefore, additional search terms were also used to identify patient outcomes related to their use. These search terms included medication adherence, patient-provider communication, outcomes, and patient engagement. Interestingly, much of the pertinent articles identified were from the Journal of Medical Internet Research. This finding may indicate a lack of research regarding providers' knowledge, attitudes, and beliefs about patient portals. Twelve articles were retrieved and evaluated, as they were related to the project's purpose. They are further defined in Table 1 (Appendix E).

The use of the patient portal function of the electronic health record to help manage chronic conditions has revealed positive outcomes. One study demonstrated improved hemoglobin A1c in portal users versus non-users (Lau, Campbell, Tang, Thompson, & Elliott, 2014). One aspect of the patient portal is the medication refill function, which was evaluated by Sarker et al. (2014). This study made it apparent that this function improves patient medication adherence. Increasing medication adherence ultimately leads to better control of chronic health problems. A study by Nijland and colleagues (2011) found that diabetic patients who utilized the portal more frequently used medications more often than low/inactive users. Similarly, Ancker et al. (2011) found that patients with chronic conditions were more likely to receive an access code and to become repeat users of the patient portal. Patients also perceive the functions in the portal to be useful. These functions include applications such as completing medication refills, managing appointments, reviewing test results and asking health related questions (Haun, Patel, Lind, & Antinori, 2015). Additionally, one study found that patients who use a patient portal felt like they were more closely monitored by their nurse, which encouraged them to have a more active role in self-managing their disease (Nijland et al., 2011).

Despite patients' perceptions about improved self-management of disease through the use of patient portals, studies have shown that patients still perceive some barriers. Ronda, Dijkhorst-Oei, and Rutten (2014), found that one of the main barriers to their use was when it comes to nonusers is that 72.4% stated that they did not use the portal because they unaware of its existence. Health literacy level is also a potential barrier found in the literature. Health literacy is often defined as the ability to access, understand, and use health associated information (Rudd, 2010). One study by Mackert et al., (2016), found that greater health literacy was associated with

a perceived increase in ease and use of health information technology (HIT) than those with lower health literacy levels.

Although the patient portal has the potential to improve self-management of disease, there are still barriers and gaps in understanding their benefit, specifically when it comes to providers. The possibility of added time constraints and lack of reimbursement was found to be of concern of providers and clinical staff among many of the studies. Providers viewed patient interaction with the portal as a positive aspect, however felt that due to time constraints, the portal was more beneficial for patient self-education than for provider utilization (Urowitz et al., 2012). Providers also felt that time constraints were an issue when it comes to familiarizing themselves with its offered features (Nazi, 2013). This lack of understanding makes patient portal education difficult (Nazi, 2013). Others raised the concerns of inadequate time to explain the portal and not enough time to respond to patient's messages in a timely manner (Miller et al., 2016). Providers also reported that they spent an equivalent to a complete workday communicating with patients through the health portal with limited reimbursement, which is not an ideal workflow (Vydra, Cuaresma, Kretoivics, & Bose-Brill, 2015).

The increase in technology and the ability to find health information online has provided patients with power to search for their health conditions, which has been found to cause additional concerns. The literature revealed that providers have concerns about how the patients will interpret the information presented within the portal. Additionally, there were also concerns about whether or not the information displayed in the portal is accurate (Witry et al., 2010). Questions were raised regarding abnormal lab results, which in some cases are considered to be clinically insignificant, but may trigger additional calls from worried patients (Miller et al.,



2016). Radiology results and provider notes were also thought to confuse patients and could cause an increase in calls between appointments (Ross, Todd, Moore, Beaty, Wittevrongel, & Lin, 2005).

Increased utilization of the patient portal also led some providers to believe that providing patients with the opportunity to become more involved in their self-care may lead to the failure of making necessary follow-up appointments (Urowitz et al., 2012). Other providers were concerned that patient portals may decrease the perceived need for office visits, potentially over utilizing email and phone communication, ultimately decreasing provider reimbursement (Miller et al, 2016). Additionally, some providers felt they would lose control of care as patients became more engaged (Urowitz et al., 2012).

The literature review conducted also revealed several other various findings that were perceived as barriers such as the age of the provider. One study found that younger physicians have a higher average usage of the patient portal and also have more patients with activated accounts (Vydra et al., 2015). Lack of provider knowledge about the portal's features was related to poor patient endorsement (Nazi, 2013). Some providers felt that in order to engage patients, they needed to have accessible computers in the clinic to demonstrate the portal's use (Nazi, 2013).

This literature review uncovered a variety of studies pertaining to patient health portals and how they can provide beneficial tools for improving patient outcomes and chronic disease management. Although limited, a few of the articles reviewed provided key information regarding providers' perceptions about the use of patient portals. Additionally, the literature lacked studies specifically pertaining to nurse practitioners and patient portal utilization. Patients

living in areas with limited access to care may benefit from utilizing the health portals to help manage their chronic diseases. However, there is limited evidence regarding provider knowledge of their use in these underserved areas. The lack of practitioner facilitation, related to poor understanding of the patient portal features and benefits, confirmed the need for more provider education. Patient portal engagement should be reciprocated between the provider and the patient. Furthermore, perceived lack of time responding to patients through the portal was consistent throughout the literature creating the need for new processes and education. In addition to improving provider education, awareness is key in the utilization of patient portals and deterring providers from their misconceptions.

## **METHODS**

The purpose of this project was to assess providers' pre-existing knowledge, attitudes, and beliefs and describe practice patterns, facilitators and barriers regarding the use of patient portals as an educational tool for patient self-management of chronic disease and develop recommendations for provider education based on the Adult Learning Theory.

### **Design**

This DNP project used a descriptive quality improvement design to identify providers' pre-existing knowledge, attitudes, and beliefs regarding the use of patient portals as an educational tool for patient self-management of chronic disease. A quantitative descriptive design is a type of non-experimental study that is used to observe, describe, and document situations as they naturally occur (Polit & Beck, 2012). Descriptive studies are often times a precursor to hypothesis development and additional quantitative studies (Polit & Beck, 2012).

In addition to a quantitative descriptive design, the Model for Improvement and the Four Phases of Quality Improvement established by the Institute for Healthcare Improvement (IHI) will be key in the initiation of the recommendations uncovered by the results of the survey. These phases include innovation, pilot, implementation, and spread (IHI, 2016). Innovation will evolve from gaps in knowledge and new ideas identified from survey. If piloted recommendations are deemed successful in the project setting, the recommendations will be disseminated to other primary care facilities within the community.

### **Ethical Considerations**

In order to protect the rights and wellbeing of the project participants, the following ethical considerations were followed and are further defined. These include respect for persons, beneficence, and justice. This quality improvement project was also reviewed by the University of Arizona Institutional Review Board (IRB) (Appendix E) and met the requirements intended to protect the participants.

#### **Respect for Persons**

In order to keep participants safe during a project, respect for persons must be followed. This allows participants to be treated as independent individuals and ensures that those with poor autonomy have the appropriate protection (U.S. Department of Health and Human Services, 1979). Respect for persons also requires that participants be given the opportunity to choose what will and will not happen to them (U.S. Department of Health and Human Services, 1979). The participants in this study were primary care providers. The study was completely voluntary and participants were able to withdraw their participation at any time. Participants were provided adequate information in order to make an informed decision on whether or not to participate.

**Beneficence**

Beneficence in research follows the concepts of do no harm and maximize possible benefits, while minimizing possible harms (U.S. Department of Health and Human Services, 1979). There were no foreseeable risks associated with the participation in this quality improvement project and participation in the project remained confidential. To protect the participants and maintain confidentiality, only aggregate data will be shared with the clinic.

**Justice**

Justice in a research study is the fairness that researchers possess when choosing their subjects (U.S. Department of Health and Human Services, 1979). Potentially beneficial research should not only be offered to patients who are in the researcher's favor and the researcher should not select "unfavorable" persons for risky research (U.S. Department of Health and Human Services, 1979). For this project, the only inclusion criterion was that participants were primary care providers and had access to a patient portal. All providers were eligible to participate in the project.

**Setting**

The setting for this descriptive study was a solely nurse owned primary care clinic located in Casper, Wyoming. Verbal and written permission was obtained from the clinic to perform this quality improvement project (Appendix A). The clinic opened in 2009 and consists of four family nurse practitioners. Additionally, the clinic utilizes eClinical Works as their electronic health record (EHR) and they have a functioning patient health portal. The primary care clinic provides care to patients across the continuum, from newborns to geriatrics. The clinic accepts Medicaid and Medicare, as well as a multitude of other insurances. The clinic also

provides management of acute illness, chronic disease, wellness and preventative visits, women's health, and well child examinations. The clinic offers a variety of services such as laboratory services, electrocardiograms (EKG), spirometry, immunizations, joint injections, and infusions such as iron and albumin. At the participating clinic patients have the ability to communicate with their provider, refill prescriptions, view their problem list, view lab results, and have access to some portions of the patient visit summary. Access to the patient portal is determined on a patient-to-patient basis.

### **Participants**

The invited participants were primary care providers who were nurse practitioners (NP) who practice at a nurse owned primary care clinic in Casper, Wyoming. The primary care providers in the clinic were all female. The participants had access to a health portal function of an electronic health record (EHR). Since the study is context specific and descriptive, there was not a required amount of participants needed for the sample.

### **Data Collection**

The participants were approached by the student who asked them to participate in this project. The providers were given an overview of the study, noting that they would be receiving an email inviting them to participate. This email contained the risks and benefits. Submission of the survey was their consent to participate. Those providers who agreed were sent an email that had a disclosure form explaining the study (Appendix B) and a link to the online self-administered questionnaire (SAQ) (Appendix C). The advantages of using questionnaires as a form of data collection include decreased cost and no risk of interviewer bias (Polit & Beck, 2012). Due to the limited number of participants that were invited to participate, maintaining

anonymity may have not been feasible, thus making confidentiality procedures imperative. Confidentiality in the absence of anonymity provides the participant with the assurance that the information that they provide will not be identifiable and accessible to others without permission (Polit & Beck, 2012).

In order to maintain confidentiality, an invitation to the questionnaire was sent as a link via email through the person in charge of the clinic's list serve. The disclosure form was attached; it introduced the project and defined its purpose (Polit & Beck, 2012) (Appendix B). The form discussed any foreseeable events that may occur by participating. The form described how the data would be used. The form also included the types of questions that the provider could expect to see on the questionnaire. Additionally, the form included the timeframe in which the questionnaire needed to be completed, as well as the estimated time it would take to answer the questions.

The web based survey service that was utilized for the questionnaire was Qualtrics (Qualtrics, 2017). This service was available at no cost using the University of Arizona license. Utilizing web-based surveys allow for the data to be readily amendable to analysis (Polit & Beck, 2012). The student's project committee members reviewed the questionnaire prior to initiation evaluated for face validity and usability. Assessing validity was important in determining whether or not the survey is effective in measuring the project's aim (Polit & Beck, 2012).

As displayed in Appendix C, questions were written in simple statements. The questions were worded in a way that eliminated response bias and was considerate and courteous to the providers' needs and circumstances (Polit & Beck, 2012). The providers invited to participate in

this study hold an advanced degree and have a known high literacy level; therefore, the questionnaire did not need to be assessed for readability (Polit & Beck, 2012).

The questionnaire contained questions developed by the student to measure knowledge, attitudes, and beliefs about the patient portal. The questionnaire also contained questions to help determine practice patterns, facilitators, and barriers to patient portal use. Each of these of these concepts became a category that helped guide the questionnaire development.

In order to fully understand the participants' current views of patient portal use; the questionnaire consisted of open and closed-ended questions (Appendix C). Closed ended questions allow the respondent to answer the questions in a limited amount of time (Polit & Beck, 2012). The closed-ended questions contained dichotomous and multiple-choice response options. The dichotomous questions required participants to select a 'yes' or 'no' response, while the multiple choice questions included three to seven options to select from (Polit & Beck, 2012).

The closed ended questions included demographic information such as, age, years in practice, and current time spent using the patient portal. Since there were four providers in the practice, maintaining confidentiality was vital for the protection of the participants. Questions with identifiable outliers were not included in the questionnaire. These questions include demographics such as highest degree achieved. The providers at the practice are all female; therefore, questions about gender were omitted. In order to gage how adults learn best, some of the questions were developed based on the key assumptions of the Adult Learning Theory first described by Knowles (Knowles, 1996). These assumptions included self-concept, experience, readiness to learn, and orientation to learn.

In order to measure knowledge, attitudes, and beliefs, a Likert-type scale was used which demonstrated a range in the responses. The questions were essential in not only identifying the current needs of the participants, but also played a key role in assessing the participants' knowledge and awareness regarding patient portal use (Losby & Wetmore, 2012). Additionally, questions assisted in assessing attitudes by allowing the respondents to choose an option that best aligned with their views (Losby & Wetmore, 2012).

The Likert-type questions included an array of responses that prompted the participant to describe their feelings based on a scale of: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The first of these questions were geared towards assessing providers' existing knowledge such as their familiarity with portal functionality, as well as their utilization of the patient portal in their current practice. The same response options were used to assess their attitudes regarding patient portal use by asking questions such as the providers' willingness to include the patient portal as an educational tool in their daily practice. Additional questions were focused on their beliefs about patient portals and how the patient's health literacy level as well as age affects their use.

The questionnaire also included four open-ended questions for participants to describe their perceptions and current knowledge of the patient portal in their own words (Polit & Beck, 2012). Limiting the survey to four open-ended questions helped decrease the risk for missing answers. Unlike close-ended questions, open-ended questions are more difficult to analyze and require the respondent to spend more time to complete (Polit & Beck, 2012). These questions asked participants to identify conditions that could benefit from patient portal communication, barriers to using the portal, and perceived concerns about patient access to their health records.



After the questionnaires were distributed, the participants had one week to complete them. In order to help improve the response rate, a reminder message was sent to all participants via email, three days after the initial questionnaire was sent out (Polit & Beck, 2012) (Appendix D). Similar to the initial disclosure, the reminder form also included the purpose of the quality improvement project. In case the initial questionnaire was deleted or lost, the reminder included a new link. The reminder included a thank you message for those who already responded (Polit & Beck, 2012).

### **Data Analysis**

Once the questionnaires were returned, the data was coded and evaluated using Qualtrics. Qualtrics was used to aggregate the total responses and perform descriptive statistics. Qualtrics offers a variety of resources that can be used to help analyze data such as charts, graphs, and tables (Qualtrics, 2017). The results were then exported into Statistical Package for the Social Sciences (SPSS) for further analysis. The levels of measurement used to evaluate the closed responses within the survey were classified as nominal and ordinal. Questions such as years in practice were considered to be nominal levels of measurement and were assigned a number to classify the characteristics into categories. These numbers had no quantitative meaning but represented a variety of values (Polit & Beck, 2012). The most appropriate descriptive statistic for evaluating these nominal questions was the mode.

The Likert-type responses questions were evaluated based on an ordinal type of measurement. As further described by Polit and Beck (2012), this type of measurement gathers information about equivalence and relative rank. The system of coding for these questions included responses such as: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5)

Strongly Agree. Respondent agreement was associated with a higher score and negative reflected lower score. In order for the student to identify the trends in knowledge, attitudes, and beliefs, practice patterns, and barriers, the most valuable calculation was to determine the mode. The mode tells the student the most frequently occurring score within each category, which helped define the areas of focus needed to provide appropriate recommendations (Polit & Beck, 2012).

The participants' age and years in practice did not require coding. In order to analyze the opened ended questions content analysis was used. Content analysis is a way of organizing and integrating data collected based on various themes (Polit & Beck, 2012). Once survey results were returned, categories were developed based on the responses.

### **Dissemination**

Once providers' current knowledge, attitudes, and beliefs, practice patterns, facilitators, and barriers regarding the use of patient portals are identified, the results will be transformed into evidence based recommendations and opportunities for education for providers guided by the Adult Learning Theory. The aggregate findings gained from the survey can further be disseminated using the four phases of quality improvement established by the Institute for Healthcare Improvement (IHI, 2016). Innovation occurs when new ideas for change develop. These new ideas will evolve from providers' current knowledge, attitudes, and beliefs. While beyond the scope of this project, the clinic will be encouraged to pilot test at least one recommendation. If the test is successful, the findings can be disseminated to other primary care clinics within the community as a best practice.

## **RESULTS**

### **Findings**

The responses in Qualtrics indicated that all four providers participated in the survey during the allotted seven-day window. As shown in Table 2, the age of four participants (N=4) ranged from 20 to 60 years old. The years of experience in a provider role ranged from 0-15. Two of the participants had five years or less of provider experience (N=2, 50%), one participant (N=1, 25%) indicated that they had 6-10 years of experience, and one participant (N=1, 25%) implied having 11-15 years of practice experience. All four participants (N=4) reported having spent various years at current practice ranging from 0-2 (N=1, 25%), 2-4 (N=1, 25%), 5-6 (N=1, 25%), and >6 (N=1, 25%).

TABLE 2. *Participant Demographics.*

<b>Age Range</b>	20-30 years old	31-40 years old	51-60 years old	> 60 years old
<b>Participants (N=4)</b>	50% (N=2)	25% (N=1)	25% (N=1)	0
<b>Years in Provider Role</b>	0-5 years	6-10 years	11-15 years	>15 years
<b>Participants (N=4)</b>	50% (N=2)	25% (N=1)	25% (N=1)	0
<b>Years at Current Practice</b>	0 – 2 years	3– 4 years	5-6 years	> 6 years
<b>Participants (N=4)</b>	25% (N=1)	25% (N=1)	25% (N=1)	25% (N=1)

The next group of questions answered by the participants identified current EHR use as well as years spent using this form of technology. Table 3 illustrates that all four of the participants (N=4, 100%) use an EHR in their current practice. The majority of participants (N=3, 75%) reported only using an EHR for five years or less and one participant (N=1, 25%) reported using an EHR for at least ten years or less.

TABLE 3. *Electronic Health Record Use.*

<b>Use of EHR in Current Practice</b>	Yes	No		
<b>Participants (N=4)</b>	100% (N=4)	0		
<b>Years Spent Using an EHR</b>	0-5 years	6-10 years	11-15 years	>15 years
<b>Participants (N=4)</b>	75% (N=3)	25% (N=1)	0	0

Table 4 illustrates current patient portal use as well as length of time spent using the portal and the hours spent performing activities related to its function. All except for one of the participants (N=3, 75%) reported using the patient portal function of their electronic health record. One participant (N=1, 25%) reported using the patient portal less than one year and two of the participants (N=2, 50%) reported utilizing the patient portal for at least one to two years. The final participant (N=1, 25%) reported using the patient portal for at greater than five years. The last element shown in table 4 demonstrates the amount of time the providers spend using functions within the patient portal. One participant (N=1, 25%) reported that they did not use the patient portal in their practice. Half of the participants (N=2, 50%) reported spending less than one hour per day on functions related to patient portal use. One participant (N=1, 25%) indicated that they spend greater than five hours per day performing functions related to the patient portal. This response appeared to be an outlier compared to the other responses, therefore the raw data was reevaluated to determine whether or not there was a data entry error (Polit & Beck, 2012). Since the data was not entered in error and eliminating the response would not change the mode, the response was kept as a part of the analysis.

TABLE 4. *Current Patient Portal Use*

Current use of Patient Portal Function of EHR	Yes	No			
Participants (N=4)	75% (N=3)	25% (N=1)			
Years Spent Using Patient Portal Function	< 1 years	1-2 years	3-4 years	>5 years	
Participants (N=4)	25% (N=1)	50% (N=2)	0	25% (N=1)	
Hours spent on portal related functions	<1 Hour	1-2 Hours	3-4 Hours	> 5 Hours	Not Using Portal
Participants (N=4)	50 % (N=2)	0	0	25% (N=1)	25% (N=1)

Practice facilitators were also evaluated. This was demonstrated by identifying current functions of the patient portal that the participants found to be useful (Figure 2). Additionally, the survey uncovered key staff (Figure 1) within the facility that helped endorse patient portal access and registration. As illustrated in Figure 2, all of the participants in the study (N=4, 100%) reported medication refills as being the most useful feature of the patient portal. Two participants (N=2, 50%) felt that directed messaging was a valuable feature. Patient visit summaries, appointment reminders, and medication and appointment lists were only found to be useful by one participant (N=1, 25%). Interestingly, none of the participants reported patient education as a beneficial feature within the patient portal. As shown in Figure 1, various staff members help with patient portal registration. All of the participants (N=4, 100%) reported the front desk and nursing staff as key players when it comes to patient portal registration. Additional staff described by the participants was medical assistant (N=1, 25%), nursing assistant (N=1, 25%), and the provider (N=1, 25%).

*FIGURE 1.* Staff who Initiate Portal Use

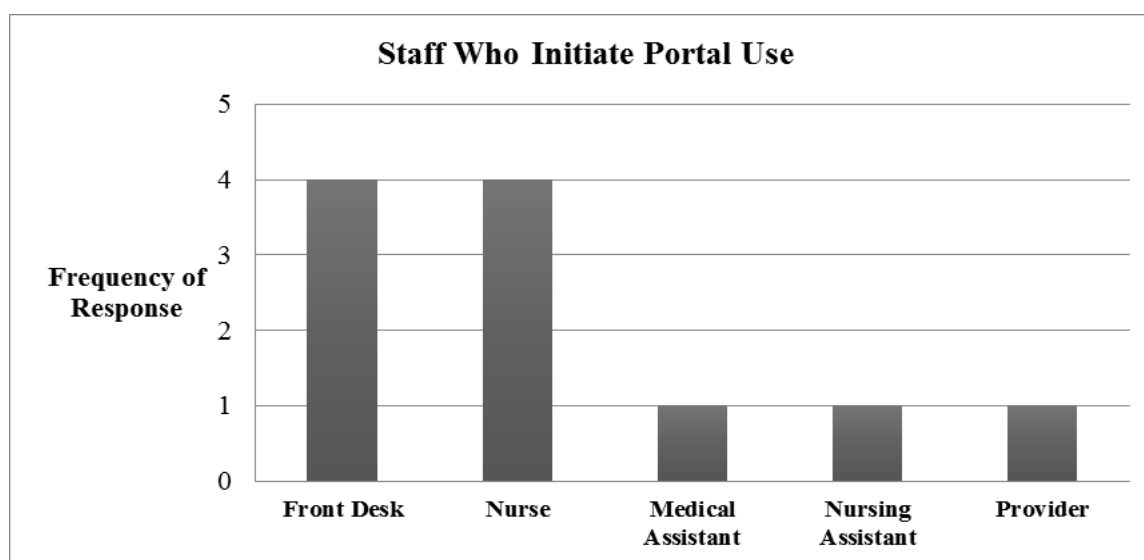
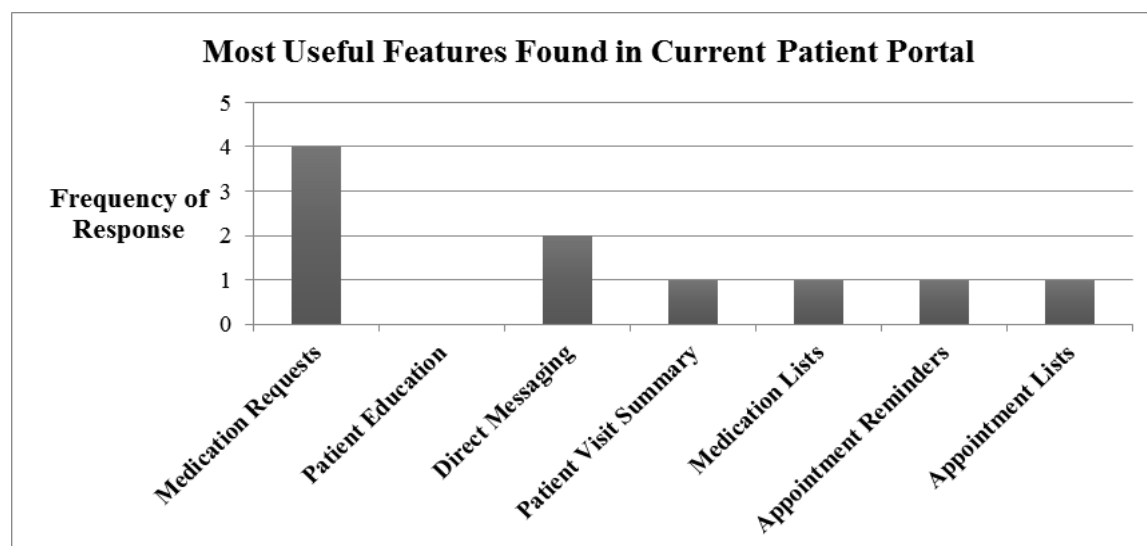


FIGURE 2. Most Useful Features of Current Patient Portal



The four participants also each answered 23 Likert type questions (Appendix C). The aggregate data from these questions were grouped together based on the categories of current practice, barriers, knowledge, attitudes, and beliefs of patient portal use (Table 5). Some of the responses lacked a common thread, therefore are further broken down and described.

Questions 13, 14, 18, and 24 were related to current practice. The responses to this category consisted of 5% (N=1) strongly disagree, 20% (N=4) disagree, 25% (N=5) neutral, 30% (N=6) agree, and 20% (N=4) strongly agree. Half of the participants (N=2, 50%) reported an “agree” response to using all functions of the patient portal, one participant (N=1, 25%) reported a “neutral” response, and one (N=1, 25%) reported a “disagree” response. Half of the participants (N=2, 50%) reported a “disagree” response to providing patient education, one (N=1, 25%) a “neutral” response, and one (N=1, 25%) an “agree” response. Half of the participants (N=2, 50%) reported a “strongly agree” response when it comes to encouraging portal use, one respondent (N=1, 25%) had “neutral” feelings, and one participant (N=1, 25%)

reported a “disagree” response. Lastly, one participant (N=1, 25%) reported a “strongly disagree” response to limiting information within the portal, one (N=1, 25%) reported a “neutral” response, one reported an “agree” response, and one reported a “strongly agree” response.

Questions 25, 26, 27, 28, 29, 30, and 31 described the barriers of patient portal use. The responses related to these barriers included 4% (N=1) strongly disagree, 29% (N=8) disagree, 14% (N=4) neutral, 25% (N=7) agree, and 28% (N=8) strongly agree. Although lacking a common sequence, the responses signified barriers to patient portal use. Half of the participants (N=2, 50%) reported a “disagree” response and the other half (N=2, 50%) indicated an “agree” response when it comes to the security of the information. Half of the participants (N=2, 50%) responded with a “disagree” response when asked if time constraints were not an issue when it comes to educating patients on portal use and one participant (N=1, 25%) had a “neutral” response. One participant (N=1, 25%) had an “agree” response, indicating that time was not an issue when educating patients about the portal. When it comes to time constraints and communicating with patients through the portal, half of the participants (N=2, 50%) answered with an “agree” response and the other half (N=2, 50%) reported a “disagree” response. The health literacy level of patients was also barrier that resulted in a variety of responses. One participant (N=1, 25%) indicated a “disagree” response, one (N=1, 25%) a “neutral” response, one (N=1, 25%) an “agree” response, and one a “strongly agree” response. Similarly, a patient’s access to technology influenced a variety of the responses. One participant (N=1, 25%) responded with a “strongly disagree” response, one (N=1, 25%) a “disagree” response, one (N=1, 25%) a “neutral” response, and one (N=1, 25%) an “agree” response. All of the participants felt that age was a barrier to portal use. Half (N=2, 50%) answered with an “agree”

response and the other half (N=2, 50%) with a “strongly agree” response. Finally, the majority of the participants were concerned how patients will interpret the information with one (N=1, 25%) “neutral” response, one (N=1, 25%) “agree” response, and two (N=2, 50%) “strongly agree” responses.

Questions 9 and 17 measured knowledge and included strongly disagree, 12% (N=1) disagree, 12% (N=1) neutral, 12% (N=1) agree, and 63% (N=5) strongly agree. A “strongly agree” response signified adequate knowledge regarding the patient portal and technology.

Questions 10, 16, 19, 20, and 22 were related to attitudes. This subcategory consisted of 4% (N=1) strongly disagree, 29% (N=7) neutral, 25% (N=6) agree, and 42% (N=10) strongly agree. Strongly agree and agree responses indicated a positive attitude towards patient portal use.

The last subcategory, beliefs, included questions 12, 21, and 23 and was comprised of 8% (N=1) disagree responses, 8% (N=1) neutral responses, 25% (N=3) agree responses, and 58% (N=7) strongly agree responses. The responses “agree” and “strongly agree” for questions 12 and 21 indicated positive beliefs towards the patient portal and EHR technology. Question 23 resulted in a variability of responses which included disagree, neutral, agree, and strongly agree indicating the potential need for more provider education regarding the patient portal.

The mode for the responses of the five categories was “strongly agree.” The category that received the highest response rate for “strongly agree” was knowledge, indicating comfort and knowledge of EHR technology. The response “strongly disagree” received the least amount of responses in all five categories. Questions related to barriers and practice patterns resulted in each of the five responses indicating variability and possible room for improvement.



TABLE 5. *Patient Portal Use*

<b>Patient Portal Use Questions</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<i>Practice Patterns</i>	5% (N=1)	20% (N=4)	25% (N=5)	30% (N=6)	20% (N=4)
<i>Barriers</i>	4% (N=1)	29% (N=8)	14% (N=4)	25% (N=7)	28% (N=8)
<i>Knowledge</i>	0	12% (N=1)	12% (N=1)	12% (N=1)	63% (N=5)
<i>Attitudes</i>	4% (N=1)	0	29% (N=7)	25% (N=6)	42% (N=10)
<i>Beliefs</i>	0	8% (N=1)	8% (N=1)	25% (N=3)	58% (N=7)

As illustrated in table 6, the open-ended questions were categorized and responses were placed in to various themes. Based on current patient portal use, 75% (N=3) of participants felt that those with diabetes mellitus (DM) currently benefited from the patient portal, 50% (N=2) felt that it was useful in those with hypertension (HTN), 25% (N=1) felt that those with congestive heart failure (CHF) benefited, 25% (N=1) reported that they used the portal for Coumadin management, and lastly 25% (N=1) found it useful in chronic obstructive pulmonary disease (COPD) management. The next question was the foreseeable benefits of chronic disease and patient portal use. The survey found that 100% (N=4) of the participants felt that patients with DM would benefit from the use of the patient portal, followed by 75% (N=3) COPD, 50% (N=2) CHF, 50% (N=2) HTN, and 25% (N=1) menopause. Interestingly, only 25% (N=1) of the participants felt that the patient portal would be useful in follow up lab management.

Although the participants found many benefits of patient portal use they also identified a few barriers. Half of the participants (50%, N=2) felt that age and technological abilities was a barrier to patient portal use. One participant (25%, N=1) found educational level to also be a barrier to patient portal use. Lastly, one participant (25%, N=1) reported a lack of screening of the information that comes through the patient portal that could be taken care of by the nurse, taking away time from the provider.

In addition to barriers, the participants also brought up concerns related to patient portal use. One of the main concerns identified by the participants (50%, N=2) was misinterpretation of the information visible on the patient portal, ultimately leading to unnecessary patient anxiety. Patient education was also a concern of one of the participants (25%, N=1). Additionally, one participant (25%, N=1) reported the patient release of information as a concern.

The participants were asked to describe how they decide which patients they will provide portal access to. Three of the participants (75%, N=3) described access to the Internet as a key factor. Half of the participants (50%, N=2) reported technological abilities as a determining factor. Lastly, one participant (25%, N=1) reported that patient age influences whether or not they provide patients with portal access.

TABLE 6. *Content Analysis.*

Category	Response	% (N)
<i>Current benefits and chronic disease</i>		
	Diabetes Mellitus	75% (N=3)
	Hypertension	50% (N=2)
	Congestive Heart Failure	25% (N=1)
	Coumadin Management	25% (N=1)
	Chronic Obstructive Pulmonary Disease	25% (N=1)
<i>Foreseeable benefits and chronic disease</i>		
	Diabetes Mellitus	100% (N=4)
	Chronic Obstructive Pulmonary Disease	75% (N=3)
	Congestive Heart Failure	50% (N=2)
	Hypertension	50% (N=2)
	Follow up lab management	25% (N=1)
	Menopause	25% (N=1)
<i>Barriers to use</i>		
	Age	50% (N=2)
	Technological Abilities	50% (N=2)
	Education Level	25% (N=1)
	Time Away from the Provider	25% (N=1)
<i>Provider concerns</i>		
	Misinterpretation	50% (N=2)
	Education	25% (N=1)
	Release of Information	25% (N=1)

*Determination of providing access*

Access to the patient portal	75% (N=3)
Technological Abilities	50% (N=2)
Age	25% (N=1)

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## DISCUSSION

This project uncovered several barriers to patient portal use that were consistent with the current literature. Some of these barriers included the patient's age, technological abilities, education level, and time that is taken away from the provider due to portal activities. In addition to barriers found in the literature, the participants also had some concerns regarding the patient portal. These concerns included possible misinterpretation of the information presented, education level of the patient, and the security of the information released.

### Recommendations

The aggregate results of this quality improvement project will be discussed with the primary care clinic's quality improvement (QI) team, which will consist of the student and both nurse owners of the clinic. A quality improvement team is a group of individuals who seek out improvement efforts within a practice (AHRQ, 2013). In order to be effective, a quality improvement team should consist of individuals who represent all areas in which the change will affect (AHRQ, 2013). As previously mentioned, recommendations to improve use will be developed based on the Adult Learning Theory and implemented using the Four Phases of Quality Improvement and the Model for Improvement developed by Institute for Healthcare Improvement (IHI).

The survey results indicated that the participants had an adequate knowledge of the patient portal. Despite the foreseeable and current benefits identified by the participants in the

study, not all the providers in the clinic utilize the patient portal and the majority of participants who do utilize the portal reported not using all of its features. This survey also uncovered some barriers to portal use such as inadequate screening of patient messages that could easily be addressed by the nurse, ultimately taking the provider away from other necessary tasks. Barriers such as this could be addressed by involving other members of healthcare team to limit simple tasks that are within the scope of practice of the registered nurse (RN). The survey also found that participants feel comfortable using technology indicating the potential for improved provider education. There are many aspects of the patient portal that participants found useful, however, none of the participants implied patient education as a useful feature, thus, potentially decreasing the patient's ability to find reputable information regarding their health condition. Findings such as these will be key in addressing the needs of the clinic to improve current patient portal use.

The findings support a need for provider education about how to use the portal for patient education and limit the barriers associated with their use. Although beyond the scope of this project, recommendations will be developed using the elements of the Adult Learning Theory. These elements include self-concept, experience, readiness to learn, and orientation to learn (Knowles, 1970). Some of these elements have already been identified based on the results of the survey. The participants all indicated that EHR technology can improve patient outcomes and they consider the patient portal to be useful in chronic disease management. These positive responses support the assumption of self-concept and how patients can benefit from portal use. All participants indicated that they currently use EHR technology within their practice and feel comfortable with technology outside of their practice. The majority of the participants responded feeling confident learning new technology and all except one respondent reported using the

patient portal function of the EHR. Barriers experienced by the participants will also be key in developing recommendations. Associating these positive and negative past experiences will help influence adoptability and continued future use of the patient portal. The majority of the participants implied that they are willing to incorporate the patient portal into their daily practice. This response along with their understanding of the benefits signifies that the participants have a readiness to learn which is one of the key assumptions addressed in the Adult Learning Theory. Finally, in order to promote orientation to learning the recommendations will be built around the participants' views of the current and foreseeable benefits of chronic disease management.

As previously mentioned, the future implementation of the recommendations will be discussed with the clinic's QI team and will be guided using the Institute for Healthcare Improvement's (IHI) Phases of Quality Improvement and the Model for Improvement. The Model for Improvement consists of forming a team, setting aims, establishing measures, identifying changes, testing changes, implementing changes, and spreading changes (IHI, 2017). As previously mentioned, the QI team will include both nurse owners of the clinic. The aim of the project will be to improve patient portal use by the providers and increase patient education that is provided through the portal. The aim should be time specific and measurable, which would be determined later by the QI team (IHI, 2017). In order to evaluate whether or not the recommendations are effective, establishing measures will be imperative (IHI, 2017). These measures will include the outcome measure, which is the rate at which the portal is used and the process measure, which will be how often the providers are providing patient education via the patient portal (IHI, 2017). The changes will be the recommendations that will be provided to the clinic based on the Adult Learning Theory. The changes will then be tested using the PDSA

cycle to determine whether or not the providers assume the new practice. Once the change is tested and refined, the change can be initiated as a new practice and further disseminated to other primary care clinics within the community.

The results of this survey create the need for other future QI projects. The primary care providers were all nurse practitioners, therefore evaluating the perceptions of other practitioners such as medical doctors (MDs), doctors of osteopathic medicine (DOs), and physician's assistants (PA's) in the area could allow for future opportunities. Primary care clinics utilize various EHR systems with different patient portal functions, also increasing the need for future QI projects.

### **Conclusion**

Limited access to healthcare and primary care provider shortages are common in rural areas. These disadvantages often place this population at risk for receiving poor, untimely, and ineffective care (HRSA, n.d.). The burden that chronic diseases play on the population and the increasing use of technology in health care has prompted the need to identify primary care providers' perceptions and needs regarding the use of patient health portals in rural areas and promote ways to improve their use.

Patient portals have been shown to improve outcomes. Although beneficial, they are not widely used throughout all primary care clinics. The results of the survey indicated that lack of knowledge and poor attitudes and beliefs are not significant findings related to decreased use. Despite the availability and positive knowledge, attitudes, and beliefs involving the patient portal, not all providers in the clinic utilize this technology. The results of the survey uncovered several barriers to portal use such as time constraints, patient age, health literacy level, access to

technology, security of health information, and misinterpretation of information, all of which are consistent with the literature. Addressing some of these barriers and involving other members of the healthcare team may improve its use. The participants' responses related to the benefits of portal use uncovered a variety of areas for chronic disease management such as DM, COPD, HTN, and Coumadin management. Although the purpose of the project was to address the idea of the patient portal as an educational tool for disease management, interestingly, none of the participants felt that the portal was a useful tool for patient education. These findings indicate the need for provider education regarding how to use the portals for patient education.

The results of the survey also identified many areas that are congruent with the Adult Learning Theory and how the information gained can enhance patient portal use. An effective quality team, the recommendations for quality improvement set forth by the Institute for Healthcare Improvement (IHI), and provider willingness will be key to the initiation and sustainability of this ongoing process improvement project.

APPENDIX A:  
PERMISSION LETTER





1900 E 1<sup>st</sup> Street

Casper, WY 82601

Tel: 307-577-7737

Fax: 307-577-0049

November 10, 2016

To whom it may concern:

I allow Kelly Eckes to work on her DNP project at our facility. She will have access to providers at their convenience to get the information she needs to complete the objectives of her project. Please feel free to contact our office if there are any questions or concerns.

Sincerely,



Amy Gruwell, FNPC

Partner of Platte River Family Practice

APPENDIX B:  
INTRODUCTION LETTER

## Introduction Letter

Dear Providers,

My name is Kelly Eckes, MSN, RN CNRN. I am a Family Nurse Practitioner student at the University of Arizona, pursuing a degree as a Doctor of Nursing Practice (DNP). I am conducting a quality improvement project on providers' perceptions of patient health portals and their influence on chronic disease management.

Participation in this DNP project involves completing a confidential online survey about your perceptions of the use of patient health portals for the management of chronic disease. The survey will take approximately 15-20 minutes to complete and will consist of demographic questions as well as both closed-ended and open-ended questions. You will have one week to complete the survey. A reminder email will be sent to all providers three days after the initial invite. After the conclusion of the study, recommendations for improvement will be developed based on the aggregated results.

Responses from this survey will remain confidential and will be used solely for the purpose of this study. Participation in this study is voluntary and you may withdraw participation at any time without penalty. There are no unforeseeable risks that have been identified in the participation of this quality improvement project. Submission of this survey means that you are consenting to the participation in this project.

This quality improvement project has been reviewed by the University of Arizona Institutional Review Board and has been deemed acceptable in meeting the requirements intended to protect the rights and wellbeing of its participants.

Survey link: Qualtrics link

Should you have any questions or concerns please contact Kelly Eckes at [keckes@email.arizona.edu](mailto:keckes@email.arizona.edu)

Thank you for your time and consideration.

Respectfully,

Kelly Eckes, DNP Candidate

APPENDIX C:  
QUESTIONNAIRE

### Provider Patient Portal Use Survey

The following questionnaire will help the researcher evaluate knowledge, attitudes and beliefs regarding patient portal use as well as practice patterns, facilitators, and barriers. The first set of questions will be questions related to demographics. The information provided will be used for study purposes and your responses will remain confidential. There are no right or wrong answers.

#### Multiple Choice

1. Age in years.  
1= 20-30 2= 31-40 3= 41-50 4= 51-60 5= >60
2. Years of practice in a provider role:  
1= 0-5 2 = 6-10 3 = 11-15 4=>15
3. Years at current practice.  
1= 0-2 2= 3-4 3=4-5 4=>6
4. I currently use an EHR in my daily practice.  
1=Yes 2=No
5. Number of total years spent using an electronic health record (EHR).  
1 = 0-5 2 = 6-10 3 = 11-15 4=>15
6. I currently use the patient portal function of my EHR.  
1=Yes 2=No
7. Length of time in years that I have been using a patient portal in my practice.  
1=<1 2=1-2 3=3-4 4=>5
8. Estimated amount of hours per day spent on tasks related to the patient portal.  
1=<1 hour 2= 1-2 hours 3=3-4 hours 4=>5 hours 5=Not using patient portal
9. I feel comfortable using a technology outside of my practice (i.e. email, web banking, internet surfing, etc.).  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
10. Learning new technology is easy for me.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree

11. EHR technology is useful in improving patient outcomes.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
12. I am familiar with the functions that my EHR 's patient portal has to offer.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
13. I currently use all of the functions that my EHR's patient portal has to offer.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
14. I provide educational materials on patient conditions to my patients who utilize the patient portal.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
15. I promote the patient portal on a patient-by-patient basis.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
16. I find communicating with my patients through the patient portal to be beneficial.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
17. I feel confident explaining the patient portal to my patients.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
18. I encourage the use of the patient portal to my patients.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
19. I am willing to include patient portal use in my daily practice.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
  
20. I feel that patient portal use improves access to care for those patients in surrounding rural communities?  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree

21. I believe that the use of patient portals can improve chronic disease management.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
22. Patient portal use improves appointment adherence in my patient population.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
23. I need more education about the patient portal in order to encourage patient use.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
24. I sometimes limit the information that my patient can see in their patient portal.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
25. The security of personal health information (PHI) plays a role as to whether or not I use the patient portal in my clinical setting.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
26. Time constraints are not an issue when educating my patients about the patient portal.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
27. Time constraints are not an issue when communicating with my patients through the patient portal.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
28. The health literacy level of my patient plays a role as to whether or not I promote patient portal use.  
  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
29. Access to technology in my patient population is not a significant barrier to patient portal use.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree
30. Patient age influences patient portal use in my patient population.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree

31. I am concerned how my patients may interpret the information that is viewable on the patient portal.  
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4= Agree  
5 = Strongly Agree

**Select all that apply**

32. What features of your facility's patient portal do you find the most useful: (select all that apply)?
- a) Medication requests
  - b) Direct messaging
  - c) Patient education
- Other (Please Comment)

33. Who also helps patients with patient portal information (select all that apply)?
- a) Front desk
  - b) Nurse
  - c) Medical assistant
  - d) Nursing assistant
- Other (Please Comment)

**Short Answer**

34. What types of patient conditions in your current practice do you feel have benefited from the use of patient portals?
35. What types of patient conditions do you foresee patients benefiting from the use of patient portals for their chronic disease management? (I.e., Diabetes, Congestive Heart Failure, Chronic Obstructive Pulmonary Disease, Hypertension)
36. What are some of the barriers that you see with patient portal use?
37. What are some concerns you have, if any, with patient's having access to their health information via the patient portal?
38. How do you determine which patients you provide patient portal access to?



APPENDIX D:  
REMINDER EMAIL

### Survey Reminder Email

Dear Providers,

This is a reminder for the request of your participation in the quality improvement project regarding your knowledge and beliefs of the use of patient health portals and the management of chronic disease.

Responses from this survey will remain confidential and will be used solely for the purpose of this study. Participation in this study is voluntary and you may withdraw participation at any time without penalty. Submission of this survey means that you are consenting to the participation in this project.

If you have already responded please disregard this email and thank you for your participation. If you have not responded you have four more days to complete.

Should you have any questions or concerns please contact Kelly Eckes at [keckes@email.arizona.edu](mailto:keckes@email.arizona.edu)

Thank you for time and consideration.

Respectfully,

Kelly Eckes, DNP Candidate

APPENDIX E:  
IRB APPROVAL



**Research**  
Office for Research & Discovery

Human Subjects  
Protection Program

1618 E. Helen St.  
P.O.Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 626-6721  
<http://rgw.arizona.edu/compliance/home>

<b>Date:</b>	March 03, 2017
<b>Principal Investigator:</b>	Kelly Eckes
<b>Protocol Number:</b>	1703255680
<b>Protocol Title:</b>	"Providers' perceptions and Current Knowledge about Patient Portal Use in a Primary Care Clinic in Wyoming"
<b>Determination:</b>	Human Subjects Review not Required

The project listed above does not require oversight by the University of Arizona because the project does not meet the definition of 'research' and/or 'human subject'.

- **Not Research as defined by 45 CFR 46.102(d):** As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge".
- **Not Human Subjects Research as defined by 45 CFR 46.102(f):** As presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention *or* interaction with the individual, or identifiable private information".

Note: Modifications to projects not requiring human subjects review that change the nature of the project should be submitted to the Human Subjects Protection Program (HSPP) for a new determination (e.g. addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the research question). Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX F:  
SYNTHESIS OF EVIDENCE TABLE

Author / Article	Hypothesis/ Research Question	Design	Sample (N)	Data Collection (Instruments/tools)	Findings
Ancker, J. S., Barrón, Y., Rockoff, M. L., Hauser, D., Pichardo, M., Szerencsy, A., & Calman, N. (2011). Use of an electronic patient portal among disadvantaged populations. <i>Journal of general internal medicine</i> , 26(10), 1117-1123.	Assess portal usage and potential differences in adoption and use based on patients' socioeconomic and clinical characteristics in a network of federally qualified health centers	Retrospective	<u>Sample:</u> n= 74,368 adult low-income patients seen between April 2008 and April 2010. <u>Setting:</u> Federally qualified health centers in in New York City and the Hudson Valley north of the city Patients under the age of 18 were excluded	Multivariate logistic regressions were used to determine characteristics associated with receiving an access code, activating an account, and using the account more than once  Analysis was performed using Analyses were performed using SAS version 9.2	During the study, 16% of patients (n=11,903) received an access code to the portal. Of those with an access code, 60% (n=7138) activated the account, and 49% (n=5791) actually used the account
Haun, J. N., Patel, N. R., Lind, J. D., & Antinori, N. (2015). Large-Scale Survey Findings Inform Patients' Experiences in Using Secure Messaging to Engage in Patient-Provider Communication and Self-Care Management: A Quantitative Assessment. <i>Journal of Medical Internet Research</i> , 17(12), e282. <a href="http://doi.org.ezproxy1.library.arizona.edu/10.2196/jmir.5152">http://doi.org.ezproxy1.library.arizona.edu/10.2196/jmir.5152</a>	To identify veteran patients' experiences in using secure messaging through a patient portal	Cross-sectional Study	<u>Sample:</u> n=819	A survey was performed to collect information such as demographic data, computer and health literacy, and secure messaging use  Analyses on the data used frequencies and proportions, chi-square tests, and one-way analysis of variance	N=499, (60.9%) used secure messaging 6 months or longer n=546, 66.7%) found secure messaging to be helpful for completing medication refills, N=343, 41.9% for managing appointments, n=350, 42.7% for looking up test results, n=340, 41.5% for asking health related questions N=328, 40.0% felt like they and other veterans would benefit from education on how to access the portal

<p>Lau, M., Campbell, H., Tang, T., Thompson, D. J., &amp; Elliott, T. (2014). Impact of patient use of an online patient portal on diabetes outcomes. <i>Canadian Journal of Diabetes</i>, 38(1), 17-21.</p>	<p>To determine if the use of a patient portal effects diabetes outcomes</p> <p><u>Hypothesis</u> Patients who use the portals will have a greater decrease in A1C.</p>	<p>Retrospective Observational Study</p>	<p><u>Sample:</u> Portal users n=50  Non Portal users n= 50</p>	<p><u>Data Collection</u> HGB A1C was evaluated at two different times. Once at baseline and at last follow up which was not sooner than 6 months and no more than 2 years after the baseline</p> <p>Each patient had a face-to-face visit with a diabetes educator during the initial visit</p>	<p>Patient portal users were more likely to control their A1C compared to nonusers (McNemar test, p=0.031)</p> <p>A1C at last follow up was lower for portal users compared to the nonusers (p=0.0195)</p>
<p>Miller Jr, D. P., Latulipe, C., Melius, K. A., Quandt, S. A., &amp; Arcury, T. A. (2016). Primary Care Providers' Views of Patient Portals: Interview Study of Perceived Benefits and Consequences. <i>Journal of Medical Internet Research</i>, 18(1), e8. <a href="http://doi.org/10.2196/jmir.4953">http://doi.org/10.2196/jmir.4953</a></p>	<p>To determine how clinic staff in low-income practices view the benefits, concerns, and potential areas for the future regarding patient portals</p> <p><u>Theoretical Framework</u> Technology Acceptance Model</p> <p>Azjen's Theory of Reasoned Action</p> <p>Theory of Planned Behavior</p>	<p>Descriptive qualitative design</p>	<p><u>Sample:</u> n=20 employees from 4 clinics in North Carolina</p> <p><u>Setting:</u> Health centers also represented diversity and included an urban academic health center and three rural federally qualified health centers</p>	<p>One-on-one in-depth interviews</p> <p>All interviews were transcribed verbatim, and each transcript was edited for accuracy</p> <p>A computerized approach using ATLAS was used to manage the data</p>	<p><u>Perceived benefits</u> Improved Office Efficiency</p> <p>Improved Patient/Caregiver Access to Information</p> <p>Increased Patient Satisfaction</p> <p>Improved Information Sharing With Other Health Professionals</p> <p><u>Perceived Disadvantages</u></p> <p>Threats to Practice</p> <p>Threats to patients</p> <p>Threats to system</p> <p><u>Future Expectations</u> Low Expectations for Immediate Use Higher Expectations for Future Use</p>

<p>Nazi, K. M. (2013). The Personal Health Record Paradox: Health Care Professionals' Perspectives and the Information Ecology of Personal Health Record Systems in Organizational and Clinical Settings. <i>Journal of Medical Internet Research</i>, 15(4), e70. <a href="http://doi.org/10.2196/jmir.2443">http://doi.org/10.2196/jmir.2443</a></p>	<p>To assess the experiences of physicians, nurses, and pharmacists at the VA using an organizational patient portal</p>	<p>Descriptive Qualitative Design</p>	<p><u>Sample:</u> n=30 VA healthcare workers</p> <p><u>Setting:</u> Veterans Health Administration (VHA) health care system</p>	<p>Purposive sampling was used</p> <p>In-depth interviews</p> <p>Interviews were transcribed, coded, and themes were identified</p>	<p><u>Reasons for lack of use</u> Time constraints, no accessible computer to educate patients, lack of knowledge, lack of perceived relevance</p> <p><u>Factors that facilitate use</u> Perceived relevance, education and training, incentives, and collaborative communication Providers felt that it improved patient communication, patient engagement, improved convenience and efficiency</p>
<p>Nijland, N., van Gemert-Pijnen, J. E., Kelders, S. M., Brandenburg, B. J., &amp; Seydel, E. R. (2011). Factors Influencing the Use of a Web-Based Application for Supporting the Self-Care of Patients with Type 2 Diabetes: A Longitudinal Study. <i>Journal of Medical Internet Research</i>, 13(3), e71. <a href="http://doi.org/10.2196/jmir.1603">http://doi.org/10.2196/jmir.1603</a></p>	<p>Assess factors that influenced the initial and long-term use of a Web-based application for supporting the self-care of patients with type 2 diabetes</p>	<p>Mixed-methods Research Design</p>	<p><u>Sample:</u> n=6 nurses</p> <p>n=50 patients who enrolled in the study were aged 43 to 80</p>	<p>Data collection Instruments included log files, interviews, usability tests, and a survey</p> <p>Statistical analyses was performed using SPSS, descriptive statistics were performed and chi-square tests and <i>F</i> tests were used to determine the differences between the participant groups which included highly active vs. the low/inactive users</p>	<p>Most common barrier was lack of access to internet (146/226, 65%) Those who used the portal often used medication more than the low/inactive users (p = .005) Those who used the portal more also had a diabetes for a longer period of time (p = .03)</p>



Ronda, M. C., Dijkhorst-Oei, L. T., & Rutten, G. E. (2014). Reasons and barriers for using a patient portal: survey among patients with diabetes mellitus. <i>Journal of medical Internet research</i> , 16(11),e263.	Access the opinions of patients with diabetes and identify perceived barriers to using a Web portal to optimize its use	Quantitative	n=1500 patients with a login to the Web portal n= 3000 patients without a portal login  Patients aged 18 to 85 randomly selected	Two separate questionnaires were sent out. One for the users and one for the nonusers  Data was analyzed using SPSS  Chi-square tests were used for the categorical variables  Unpaired <i>t</i> tests were used for all normally distributed variables  Mann-Whitney tests were used for non-normally distributed continuous variables	72.4% of nonusers stated that they did not use the portal because they unaware of its existence  28.5% did not have any interest in managing their own disease  11.6% felt feelings of inadequacy when using the computer  Patients treated by non practitioners were mostly non users compared to those who saw internists 78.8%, vs. 28.3%  More users than nonusers became aware of the Web portal through their physician 94.9%, vs. 48.8%, Nonusers perceived certain portal content to be not as useful as regular users did 71.7%, vs. 92.3%
Sarkar, U., Lyles, C. R., Parker, M. M., Allen, J., Nguyen, R., Moffet, H. H., ... Karter, A. J. (2014). Use of the Refill Function through an Online Patient Portal is Associated with Improved Adherence to Statins in an Integrated Health System. <i>Medical Care</i> , 52(3), 194–201. <a href="http://doi.org/10.1097/MLR.0000000000000069">http://doi.org/10.1097/MLR.0000000000000069</a>	Assess whether or not statin adherence is improved after the use of a portal refill function	Observational cohort study	<u>Sample:</u> n=8,705 Diabetic patients on statins who used the online refill function of a patient portal  n=9,055 who never used the online refill function determined by risk-set sampling	Difference-in-differences framework  Statin adherence was measured before and after the refills	The prevalence of medication non-adherence did not change pre-post non-users of the refill function Non-adherence decreased from 26% to 24% among occasional users (p=0.01) Non-Adherence decreased from 22% to 15%, p< 0.001) among those who exclusively refilled their medication

<p>Urowitz, S., Wiljer, D., Dupak, K., Kuehner, Z., Leonard, K., Lovrics, E., ... Cafazzo, J. (2012). Improving Diabetes Management with a Patient Portal: Qualitative Study of a Diabetes Self-Management Portal. <i>Journal of Medical Internet Research</i>, 14(6), e158. <a href="http://doi.org/10.2196/jmir.2265">http://doi.org/10.2196/jmir.2265</a></p>	<p>To evaluate the experience of patients and providers using an online diabetes management portal for patients</p>	<p>Descriptive Qualitative design</p>	<p><u>Sample:</u> Purposive sampling was used.</p> <p>17 Patients (n= 8 males, n=9 females) and 64 health care providers that included general practitioners, nurses, nurse practitioners, dieticians, diabetes educators, and other clinical staff</p>	<p><u>Data Collection</u> Patients received semi-structured telephone interviews</p> <p>Providers answered five post-study, open-ended questions related to their experience with the patient portal</p> <p><u>Data Analysis</u> Text from transcribed interviews with patients and open-ended responses from providers was coded and organized by theme</p>	<p>Qualitative results-Four themes were identified include facilitators of disease management, barriers to portal use, patient-provider communication and relationship, and recommendations for portal improvements</p>
<p>Vydra, T. P., Cuaresma, E., Kretovics, M., &amp; Bose-Brill, S. (2015). Diffusion and Use of Tethered Personal Health Records in Primary Care. <i>Perspectives in Health Information Management</i>, 12(Spring), 1c.</p>	<p>To determine PHR use patterns in the primary care setting, identify physician characteristics affecting adoption, and determine perspectives on use</p>	<p>Descriptive Qualitative Design</p>	<p><u>Sample:</u> Survey was sent to n=89 physicians</p> <p>n=54 physicians returned the survey making this the sample incomplete</p> <p>n=4 agreed to participate in a focus group</p>	<p>Qualitative data was Obtained through the use of a semi-structured provider focus groups.</p> <p>Audio recording of the focus group was transcribed using detailed transcription</p> <p>The scribe notes and tape were reviewed to verified the accuracy</p>	<p>Providers who practiced longer estimated more time spent communicating with patients on the system compared to newer providers. Patient portal activations were found to decrease the longer the provider was in practice</p> <p>Providers perceived improved patient communication and satisfaction with use, but lack of reimbursement for communication was a barrier to use</p>

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<p>Witry, M. J., Doucette, W. R., Daly, J. M., Levy, B. T., &amp; Chrischilles, E. A. (2010). Family Physician Perceptions of Personal Health Records. <i>Perspectives in Health Information Management / AHIMA, American Health Information Management Association</i>, 7(Winter), 1d.</p>	<p>To assess physician and medical staff views on the benefits and barriers of the personal health record</p>	<p>Descriptive Qualitative design</p>	<p><u>Sample</u>  Initial Focus group  n=8   (n= 4 physicians and n=4 residents)   First Subsequent focus group  n=8   (N=4 physicians and N=4 nurses.   Second focus group  n=3 (n= 1 physician and n=2 nurses   Third focus group  n= 10   (n= 3 physicians, n=4 residents, n= 2 nurses, and n=1 pharmacist)</p>	<p>Focus groups   Transcripts from focus groups were analyzed using a multistep process to identify themes</p>	<p>Themes related to providers perceptions that were identified included   PHR benefits   Concerns with PHRs   How PHRs might be used by providers   PHR maintenance   Perceptions about how patients might use and interact with PHRs</p>
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<p>Ross, S. E., Todd, J., Moore, L. A., Beaty, B. L., Wittevrongel, L., &amp; Lin, C.-T. (2005). Expectations of Patients and Physicians Regarding Patient-Accessible Medical Records. <i>Journal of Medical Internet Research</i>, 7(2), e13.</p>	<p>Compare the attitudes toward medical records among socioeconomically disadvantaged patients, insured patients in primary care offices, and physicians in outpatient practice</p>	<p>Quantitative</p>	<p>Patients 18 years and older</p> <p>Patient Surveys returned</p> <p>N=295 community health centers</p> <p>N= 306 from academic primary care centers</p> <p>Provider surveys returned</p> <p><u>N=340 from primary care group</u></p> <p><u>N=224 from specialist group</u></p>	<p>Written questionnaires in waiting rooms for patients.</p> <p>Questionnaires sent via mail to providers</p>	<p>Response rate for patient 79% (601 surveys returned) and Response rate for physician surveys 53% (564 surveys returned)</p> <p>Academic medical center patients and community health center patients were equally likely to support Internet-accessible records (54% vs 57%)</p> <p>Community health center patients were more likely than academic medical center patients to see benefits of shared medical records (mean number of expected benefits = 7.9 vs 7.1, <math>P &lt; .001</math>), and they were more likely to expect problems with shared records</p> <p>Predictors of patient support of the of Internet-accessible records were history of the Internet (OR = 2.45, CI 1.59-3.79)</p> <p>Physicians were significantly less likely than patients to anticipate benefits (mean number of expected benefits = 4.2 vs 7.5, <math>P &lt; .001</math>)</p>
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