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Use of Secure Messaging By United States Veterans and Significant Others

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USE OF SECURE MESSAGING BY UNITED STATES VETERANS AND

SIGNIFICANT OTHERS

By

Claudia S. Derman

A Dissertation Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

In Nursing

at

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December, 2014

ABSTRACT

USE OF SECURE MESSAGING BY UNITED STATES VETERANS AND

SIGNIFICANT OTHERS

By
Claudia S. Derman

The University of Wisconsin-Milwaukee, 2014
Under the Supervision of Professor Karen H. Morin, PhD, RN, ANEF, FAAN

The purpose of this study was to describe the topics discussed using secure

messaging (SM), the pattern of use of SM, and whether the themes discussed and/or the

pattern of use varied based on gender and age of the SM user. Secure messaging is an

example of a technology that focuses on patient-centered communication. Secure

messaging allows patients to communicate with their clinicians using the Internet and at

their convenience, while maintaining the privacy of the information exchanged. Secure

messages, if approved by the patient, may also be written by family members or

significant others for the patient. By its nature, the use of SM is indicative of an

individual's involvement in their healthcare, utilizing self-management skills. Few

studies were found that reported on the content of messages written by patients or their

families. No studies were found that reviewed the topics patients write about in these

secure messages nor were studies found that tracked the number of messages written by

patients and relating to the days and time that were most utilized.

A review of 1200 secure messages written by veterans and their caregivers was

undertaken to determine what information was contained within the secure messages.

The 1200 messages contained 1720 themes that were grouped using content analysis to

yield a total of ten topics. The day of week and the time of day of messages were additionally reviewed by gender and age of the individual. Messages written by friends of family members were reviewed and compared to those written by patients.

The topic most addressed as that of medications, with more than one-third of the 1720 themes within messages relating to medications. Veterans aged 55 to 64 years were the greatest users of the SM system followed closely by those between the ages of 65 to 74. Men wrote most frequently about medications while women wrote more themes related to the topics of complaints and concerns and consultations with specialists.

Pattern of use of relative to time of day and day of the week was also reviewed in subset of the sample (*n*= 600). The most common time frame during which messages were sent was between 9:00 a.m. and 6 p.m., accounting for more than 70% of all messages. Tuesdays and Thursdays were the most often utilized days of week for SM.

The implications of this study include revisiting how MyHealth*e*Vet is configured to enhance the veteran's ability to communicate effectively and appropriately with healthcare providers. It is possible that participants employed SM rather than other identified means to contact providers as they were assured of a response within a defined period of time. Findings have implications for users, clinicians, hospital administrators, and technical staff. The purposes of SM can be revisited with users, clinicians may wish to consider alternative strategies, and administrators may wish to revisit the current structure in terms of identifying a method to sort the information contained in SM.

DEDICATION

This dissertation is dedicated to

Ben, Rachel, Sarah, Sophie, and Mia

I am sorry I missed so much time with you over the last several years. Please know, as evidenced by this paper, that you can do anything if you put your mind to it. I hope this will inspire you to always reach further—as you have inspired me;

And thanks to Beth and Joe for their patience.

This paper is also dedicated to my cousin Mary Ellen who kept encouraging me.

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Chapter 1

Introduction

Nurse-patient communication is vital as it contributes to improved health outcomes (Robinson, Callister, Berry, & Dearing, 2008). Moreover, the nature of this communication is client-centered because patients are the focus of the interaction (Rogers, 1951; Rogers, 1957; Sheldon, 2009). Expand the personnel to include all healthcare providers, which include nurse practitioners, physicians, physician assistants, and the need for patient-centered communication becomes essential to practice and patient care. Healthcare communication is no longer limited to face-to-face, one-on-one discourse; closed-captioned home visits or tele-health occur, with telephones having long been used to address patient concerns (Eysenbach, 1999; Weiner, 2012). The advent of sophisticated technologies has spurred the development of telemedicine and tele-health practices in healthcare, changing healthcare delivery for many patients and providers (Bashur, Shannon & Sapci, 2005).

The intent of this chapter is to introduce secure messaging (SM) as an example of sophisticated technology that focuses on patient-centered communication (Brennan, Downs, & Casper, 2010). SM allows patients to communicate with their providers via the Internet, while maintaining the privacy of the information exchanged (Tsai & Rosenheck, 2012). The topic is introduced and some background information on SM is provided. The problem is explicated. The research questions are introduced, a theoretical framework is discussed to lend support, and the significance of the study is considered from several nursing perspectives.

Problem Identification

The problem discussed is that the use of secure messaging within health care is a relatively new technology that has not been studied prior to being fully embraced. As the use of computerized technology has increased, Klein, Conn, and Sorra (2001) point out that many organizations fail to fully implement the innovations they adopt. Klein et al. point to the fact that organizations fail to gain employees' skilled, consistent use, and commitment to innovation at times because the organization does not fully study and support the implementation. The authors also point out that users of these systems do not always fully understand the application of the innovation. By focusing on the use of the SM, the technology will be better understood and may be clarified for users of the system. Review of the outcomes of this study should assist organizations in planning future iterations or updates to the SM system—from both the system and users' viewpoint.

Pew Research reports that 80% of Internet users look on the web for health information (Fox, 2012). In 2009, Eysenbach described consumer health informatics (CHI) as the branch of health informatics in which consumers' needs for information are analyzed. Eysenbach included in CHI the methods for making information accessible to consumers as well as for integrating consumers' preferences into medical information systems. CHI is seen as essential to the engagement of patients in their healthcare (Veinot & Souden, 2012). Gibbons et al. (2009) discuss that CHI applications can enhance the efficacy of interventions delivered by clinical staff, and support the individualized and personalized tailoring of information as well as behavioral feedback.

Background. The use of electronic mail (email) for communication between providers—specifically physicians—and patients was first mentioned in the literature in the mid-to-late 1990s (Kane & Sands, 1998; Mandl, Kohane & Brandt, 1998; Pallen, 1995), and is seen as one of the first uses of CHI (Ferguson, 1998). In 1994 Neill, Mainous, Clark, and Hagen investigated electronic mail and reported that electronic mail was perceived by patients as increasing the speed, the convenience, and access to medical care. Coiera (1995) reported that 46% of Californians employed email in their daily lives and suggested that it held potential for additional communication between physicians and their patients.

Email, as commonly used by the general public, is not secure. This security awareness issue was identified during the mid-1990s, as personal information became more available on the Internet (Kane & Sands, 1998; Mandl, Kohane, & Brandt, 1998). A server may be used to increase privacy and safety of the personal information, but connections between servers are not necessarily secure and third parties may intercept email messages. Using email safely today also requires special encryption processes to protect individuals' privacy (Fitzgerald, Goins, & Herold, 2007).

Cognizant of the impact of published personal information on the Internet, in 1996 the U.S. Department of Health and Human Services (HHS) began the process of establishing standards for health information (Gostin, 2001). The standards included securing health information and protecting the privacy of individuals to whom the information belonged (Lumpkin, 2000). In 2003 the final bill that included the privacy rule, named the Health Insurance Portability and Accountability Act (HIPAA) was passed, and remains in effect today (Solove, 2013). HIPAA established national

standards to protect individuals' electronic medical records and other personal health information (HHS, 2002).

Implementation of HIPAA has had a profound impact on tele-communication. As a result of HIPAA it is no longer professionally appropriate, from a privacy standpoint, to use email for patient-provider communication (Ralston et al., 2009). To address this concern, one recent CHI effort to enhance communication between healthcare providers and patients has been through the use of secure email, called secure messaging.

The availability of large volumes of detailed and explicit electronic health information has been accompanied by privacy concerns for facilities of all sizes (Malin, El Emam & O'Keefe, 2013). A layer of security around an organization's computer servers involves the routine use of what is referred to as a firewall (Kindberg, et al., 2002). Despite the name, a firewall is a software barrier to keep destructive forces away from an individual's computer and information, and works with a router program to examine each network packet of information to determine whether to forward it toward its destination (Nayak, Reimers, Feamster, & Clark, 2009). However, email messages transmitted using Simple Mail Transfer Protocol (SMTP) and File Transfer Protocol (FTP) move through most firewalls without restriction (Singhal, Winograd & Scarfone, 2007).

Secure File Transfer Protocol (SFTP) is the secure way to move data (Bass & Berlich, 2007). This step for protecting private information involves the use of encryption systems in the form of keys, to change messages into encoded text. The text is encrypted by means of an algorithm (Henry, 2007). Thus no one other than the

receiving party who has the key in the form of an access code can translate, or decrypt the text and convert it into comprehensible text (Benaloh, Chase, Horvitz, & Lauter, (2009).

Secure messaging. Secure messaging (SM) is the latest outcome of security concerns. It is a protected electronic communication format that allows the use of messages, similar to email but protected through a secure environment (Zhou, Garrido, Chin, Wiesenthal, & Lang, 2007). SM adds further security measures, such as a web portal, to ensure patient privacy. A secure web portal allows only authenticated users accessibility to all manner of data (Bass & Berlich, 2007; Gao, Greenspan, Welsh, Juang, & Alm, 2006).

The Veterans Health Administration (VHA) employs SM within its patient information website, MyHealth*e*Vet (MHV). The MHV program is a personal health record (PHR) located on a secure website. Within it are many avenues to find, record, and compile health information which can then be viewed by the veteran. Among the options within MHV is the ability for patients to send and receive secure messages from providers and healthcare team members. This type of messaging system meets requirements of HIPAA for protection of personal information (AMA, 2010).

Within the VHA's SM program, a user, who could be a patient, family member of the patient, friend of the patient, or a provider, initiates a message. The secure message is dated and timed internally by the program. The user includes a SM subject line for the message being created. Users also have the option of continuing to write secure messages by adding on or replying to the provider's reply message. Thus a "volley" of messages is begun, with all additional conversations attached to the original message. This string of messages is also referred to as a SM thread.

The use of SM within the Veterans Health Administration (VHA) has been evaluated based on number of messages and by turnaround time. Both of these measures are recorded on a weekly basis and the results are shared with hospital administrators. These reviews may be important but don't always reflect how SM is used functionally by either patient or health care provider. Moreover, there appear to be some factors that may influence SM usage. Gender and age are particularly relevant factors to this study.

The use of the Internet to retrieve health information, messaging with healthcare providers, and work within a personal health record (PHR) varies by gender. Review of studies related to gender and healthcare demonstrates that women tend to use more healthcare services and spend more healthcare dollars than men (Cylus, Hartman, Washington, Andrews, & Catlin, 2011). Women have more incidents of acute illness and require more long-term care (Cherepanov, Palta, Fryback, & Robert, 2010; McGlynn, 2003; Owens, 2008). Survey statistics compiled by the Pew Research Internet Project, 2013 demonstrate that women were more likely than men to research health information on the Internet—79% versus 65% for men (Fox & Dunnan, 2013). Women were more likely than men to refill a prescription and make an appointment online, as well as to communicate with a healthcare provider using the Internet (Cohen & Stussman, 2010).

Age of individuals may impact the use of SM. Looking at an early healthcare system that utilized SM with patients demonstrated that SM users were likely to be middle aged, between 50 and 65 years of age (Ralston et al., 2009). At a military treatment facility, the average age of SM users was reported as 40 years, though the sample was drawn from mostly military clients (Agarwal, Anderson, Zarathemete, & Ward, 2013).

Weppner et al. (2010) chose to look at the use of SM by older patients with diabetes, using the Epic® systems product for electronic health records. They found that men in the 65 to 69 year old age group of had the highest use of SM, which was slightly more than one secure message sent to their provider per month. In a study at a large medical site, Nielsen, Halamka and Kinkel (2011) found that the mean age of SM users with the diagnosis of multiple sclerosis was 45. One outcome of a summit for consumer health information noted that computer users greater than 60 years or those who have not completed high school are less likely to be online (Ahern, Woods, Lightowler, Finley, & Houston, 2011). A conflicting comment in the same article, noted Internet usage was beginning to increase in users more than 60 years of age and that some patients also encouraged family or friends look online for health information about them.

How health care providers use SM has received some attention. Tang, Black and Young (2006), completed a content analysis of physicians' email messages to determine if physicians' messages contained enough information to allow evaluation and management (E&M) coding for the service. These codes are published in the Current Procedural Terminology (CPT) code set to allow coding and charging for the messaging (Tang, Black, & Young, 2006). Meyer, Atherton, Sawmynaden, and Car (2012) searched for reports of research using controlled trials, quasi-randomized trials, controlled before and after studies and times series studies using email for communicating the results of diagnostic medical testing. The authors found that no studies were identified for aspects of subject inclusion, thus no analysis was even possible.

No studies have been found that describe and evaluate patient messages within the VHA's SM system. Yet, having such information is an important first step to gaining a

sound appreciation of the health potential of this medium and to provide evidence to support its continued use. To maximize SM utility, the methods of how SM was actually being used needed to be examined.

Purpose

The purpose of this study was to describe the themes discussed using SM, the pattern of use of SM, and whether the themes discussed and/or the pattern of use varied based on gender and age of the SM user. The SM users in this study may be a patient, or in some cases, may be a patient caregiver, spouse, relative or friend.

<div align="center">

Research Questions

</div>

The research questions for this study were:

1. What topics do patients, family members, or friends of the patient discuss when using SM?

2. What is the relationship between SM topics discussed and gender of the patient?

3. What is the relationship between SM topics discussed and the age of the patient?

4. What are the patterns of use of SM by patients and caregivers?

5. What are the patterns of use of SM as differentiated by patient gender?

6. What are the patterns of use of SM as differentiated by patient age?

<div align="center">

Theoretical Framework

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The theoretical foundation upon which this study was based is the Individual and Family Self-Management Theory (IFSMT) by Ryan and Sawin (2009). Ryan and Sawin's framework for self-management stemmed from finding gaps in the existing science. Their study included findings that even the term, *Self-management*, varied. Self-management is a multidimensional complex phenomenon that can be conceptualized

as affecting individuals, dyads or families across all developmental stages. Ryan and

Sawin (2009) define self-management much as Lorig (2001, 2006) defined self-

management, which is the tasks individuals must undertake to live with one or more

chronic conditions.

Self-management includes condition-specific risk and protective factors,

components of the physical and social environment and the unique characteristics of

individuals and family member. Ryan and Sawin (2009) suggest that self-management

behaviors are used to manage chronic conditions as well as to engage in health promotion

behaviors. The IFSMT (Ryan & Sawin, 2009) is a mid-range, descriptive theory. The

purpose of this dynamic theory is to incorporate health-related behaviors into individuals'

or families' daily functioning. The IFSMT proposes that self-management is a

phenomenon consisting of three dimensions: context, process and outcomes. Each

dimension is comprised of several factors.

The context dimension is composed of three factors. These factors demonstrate

the influence of the individual and of family engagement on the process of self-

management. The factors include medical condition-specific factors, physical/social

factors, and individual and family factors (Ryan and Sawin, 2009).

The process dimension is also comprised of three factors. The first is the

knowledge and beliefs factor, which is a display of self-efficacy. The second factor, self-

regulation, is the process used to change health behavior, such as self-monitoring or goal-

setting. Finally, the social facilitation factor includes the concepts of social influence,

social support and collaboration between individuals and families and their healthcare

providers.

The third dimension examines outcomes. In the IFSMT theory, outcomes are viewed both proximally and distally; the proximal outcome is the actual use of self-management behaviors specific to the condition or risk and also includes symptomatology and pharmacologic therapies. The distal outcomes are dependent upon successfully having achieved the proximal outcomes. Additionally, once proximal outcomes have been achieved, the distal outcomes then include individuals' health status, their quality of life or perceived well-being, and the costs of health (Ryan & Sawin, 2009).

Ryan and Sawin (2009) caution that it is imperative to recognize the interdependence of their model's constructs and concepts. Also, they stress that many of the underpinnings of the theory are also borne out in other areas of life. There is a great deal of interdependence in this theory; each area affects the other as well as an individual's or family's method of dealing with the various dimensions.

In the current study two constructs are of interest: context and process. Context includes two concepts; physical environment and individual characteristics. The factors of the process dimension include the concepts of the self-regulatory skills and abilities along with social facilitation.

The IFSMT model is used in this study with the premise that the use of SM is conceptualized as reflecting the incorporation of health-related behaviors into routine living, a key concept of the model. Consistent with the tenets of the IFSMT, engaging in SM with a provider is indicative of caring about one's health, clarifying questions, and seeking direction from the healthcare team. Zhou, Kanter, Wang and Garrido (2010) noted differences in patient outcomes when comparing SM users with those not using

SM. Several studies have examined the use of SM among patients with chronic conditions, hypothesizing the effect of SM on self-management skills. Weppner et al., (2010) noted an increase in use of SM as morbidity increased in diabetic patients. Lin, Wittevrongel, Moore, Beaty, and Ross (2005) reported that patients with chronic conditions believed that knowledge of their condition and self-management skills improved based on SM.

Secure messaging is one method of incorporating health-related behaviors into individuals or families daily functioning. Though this study does not approach the degree of specificity of the IFSMT, the theory is used as a foundation and a framework for the investigation. The relationship between framework concepts and the variables in this study is presented in Table 1.

The dimension of context contains two factors. One factor is the Physical Environment and the other factor is comprised of Individual Characteristics. The Physical Environment is a mandatory concept. It is made operational in this study as access to SM. The use of SM requires access not only to a computer, but access to the Internet as well. This computer/Internet access can be achieved in the veteran's home, at a VA facility, or a library or other possible locations for Wi-Fi access. This is an important consideration as it lends structure to the study. This combination of user-descriptors will be used as discriminatory points to guide the answering of several of the research questions and is an assumption of the study.

The second factor considered within Context is that of individual characteristics. Individual characteristics situate users at their current point in life. The context of

Individual Characteristics is represented in the study by the user's gender and their age at

the time the message was written.

Table 1.

Select Self-management study concepts

Dimensions	Factors	
Context:	Physical Environment	Individual Characteristics
	Access to SM/Internet	- **Age**
		- **Gender**
The concepts of Physical Environment and Individual Characteristics together Process:	Knowledge and Beliefs	
	- Assume self-monitoring behaviors by use of SM	
	- Assume self-efficacy in an individual's ability to utilize the technology	
	Social facilitation	
	- Assume family/friend support/collaboration	
	- Assume collaboration w/healthcare provider	
Distal outcomes:	Unknown	

Note. Variables integral to study are bolded.

The second dimension is Process. This dimension is made operational as the actual use of the ability to self-manage. Not all factors found within Ryan and Sawin's description of self-regulatory skills and abilities, knowledge and beliefs, and social facilitation are discussed in the statement of the problem. These factors are assumed and are peripheral to this study. The research questions reflect patients' ability or even their motivation to enter information into the SM system as being reflective of their participation. The research questions do not address the patients' ability to record changes in health or the fact that the individual has health as a goal. However, one could hypothesize that if individuals did not care about health, they wouldn't be interested in monitoring their behaviors, collaborating with their healthcare provider, or any of the factors in the IFSMT. Thus, the following factors are presented to lend structure to the IFSMT. The Process dimension contains the self-regulatory skills and abilities addressed by the system, and are reflected by the individual veteran while writing SM. These inherent abilities include the individual's values for health and the willingness to be observant of these while making health a personal goal.

The knowledge and belief factors are indicative of self-efficacy and the individuals' ability to self-monitor. These factors are not addressed in this study. Social facilitation in this study represents support of the individual. This support comes from within, from family and friends as well as from healthcare providers. In some cases, this support could be reflected in family participation in the process of SM, but that is not specifically addressed in this study.

The third dimension considered is Outcomes. As noted, several authors reported that patients' use of SM decreased the rate of office visits and telephone contacts

(Weppner et al., 2010; Zhou, Garrido, Chin, Wiesenthal & Liang, 2007). As more healthcare centers begin to reimburse for SM, the outcome may result in decreased office visits, resulting in financial savings for healthcare (Tang, Black & Young, 2006). However, at this point, health outcomes are not being measured in this study and cannot be determined. Based on the findings of this study, potential outcomes related to SM may be able to be explored in the future directed by the theory. Although provider office appointments related to topics written of in SM could be captured, those potential factors in this dimension are not within the scope of this study. The first step is to understand what is discussed within secure messages and how patients use the SM system.

Applying this framework of self-management will begin identifying self-management behaviors in patients in relation to the use of SM. This mid-level theory of IFSMT provides direction to this study through the concept of self-management. As such, studies related to the efficacy of self-management behaviors offer promise to improving health outcomes.

Conceptual and Operational Definitions

This section contains both conceptual and operational definitions pertinent to this study. Definitions addressing the variables in this study, as well as select terms for which clarity are needed, are included.

Healthcare Team

The conceptual definition of the healthcare team for the purpose of this study is the group of staff that together care for the veteran, active duty member, or dependent (McNamee, Howe, Nakase-Richardson, & Peterson, 2012). In this study, a patient-centered healthcare team was operationalized as being comprised of a provider—

specifically, a nurse practitioner, a physician or a physician assistant—a nurse, and a clerk.

Pattern of Use

The conceptual definition of pattern of use is the repeated behavior, the frequency or standard in which an object is habitually contacted or "touched" either physically or in this case, using the Internet (Don et al., 2007). In this study, pattern of use was made operational as the frequency or occurrence of use of SM by the SM User. Examples of this included a monthly habit frequency or the repeated behavior of use of SM every Monday morning or during the early hours of the day.

Personal Health Record (PHR)/MHV

The conceptual definition of a PHR is an electronic, lifelong resource of health information used by individuals to make health decisions (AHIMA, 2012). But before there was a PHR, there was an electronic health record or EHR. The two are distinct, but related entities, and the content of each is not the equal of the other. To operationalize this variable, the PHR referred to is the VHA's My Health*e*Vet (MHV) PHR, accessible at http://myhealth.va.gov/.   Accessing the MHV program was the method of entry into the SM process, allowing the messaging system to run from a secure website. More information about the functionality of MHV PHR is presented in Chapter 3. For consistency MyHealth*e*Vet, was referred to in this study as MHV.

Secure Messaging (SM)

Secure messaging (SM) is conceptually defined as the ability to communicate with healthcare providers using the MHV web portal, which is password protected and encrypted, as well as HIPAA compliant (Nazi, 2013).   SM was operationally defined as

the process of communicating in text with healthcare providers in an information-secure environment (Zhou, Garrido, Chin, Wiesenthal, & Lang, 2007). Messages received from and sent to patients, family, or dependents may, at the provider's discretion, become a part of the patient's EHR.

SM Thread

Conceptually a SM thread is a set of messages (Shah, 2012). Operationally, a SM thread was initiated by an SM user (either patient or provider) as a communication to a member of the healthcare team. The team member answered the message within 72 hours. If the SM user replied back to that message and a team member did as well, all of those messages were considered to be within the same SM thread, sometimes referred to as a message string (Forstall, Christie, & Lemay, 2011).

SM User

Conceptually an SM user is anyone who uses SM. In this study a SM user was a veteran, a family member, dependent, or friend, that is, a surrogate to the veteran, who read and wrote messages within the MHV secure messaging program.

Assumptions

Within the aim of this study, the context concepts of ISMFT were considered to be SM users who have a desire to use the SM system. Since the study is observational, users already have a predilection for SM, and did not need to be encouraged to use it.

1. SM users or their identified surrogates enter data into their SM in an accurate and truthful manner.

2. SM users have a degree of technical skill to work with the computer.

3. SM reflects an aspect of self-management (Ryan & Sawin, 2009).

Significance

Practice

In 2001, the Institute of Medicine (IOM) set a path for 21st century healthcare that includes six aims for improvement in the quality of healthcare, including the idea of patient-centeredness. Patient-centeredness, similarly encouraged in 1951 by Rogers as client-centered care, has several dimensions that incorporate the requirement for patient information, communication, education, and support, as well as involvement of family and friends (IOM, 2001). All of these can be achieved through the use of SM. Patient-centered or client centered—the premise is the same; the individual is at the helm of the process.

Nurses are at the forefront of changes occurring in healthcare at this time and as nurses comprise the largest segment of the healthcare workforce, they frequently interface between patients and their access to healthcare. Nurses also have the most sustained interactions with patients (Cohen, 2006, IOM, 2011). Nurses are also the largest healthcare users of technology (IOM, 2010), ranging from care delivery methods, medication administration processes, procedures provided, and communications with other staff.

In the 21st century, technology has provided new methods to assist in patient centeredness. Timeliness is clearly an issue that can be assisted through the use of the Internet, according to the IOM (2001). While insufficiently reliable in an emergency, several of these quality aims of patient-centered care can be met through the use of SM as a communication tool.

Nursing is a key partner with patients in healthcare (IOM, 2011) and yet nurses know little regarding patients' use of SM. The first step, then, is to describe how patients and health care providers use SM. Due to the lack of research it is unclear if patients are asking the correct questions or providing the correct information to the healthcare team. Part of the way the healthcare team responds is contingent upon what the patient is writing, sharing, describing, or asking about in the SM. If the patient does not convey the correct information, the healthcare team cannot respond in a meaningful way. Results of this study could ultimately inform patients about how they can optimize the use of the SM system to get the answers they seek. Results of the study could also provide feedback to healthcare professionals on how they can also better use SM. The outcomes of this study have the potential to enhance patient-centered care in a timely and efficient manner, as suggested by the IOM. The findings of this study may also contribute to nursing practice by clarifying ways in which consumers actually use SM so when future research is undertaken, nurses as experts in the field of SM are key players in the design and implementation of studies.

This type of electronic messaging also has the potential to induce cultural changes in the transfer of information in a medical context (Kassirer, 1995). Unlike telephone calls to providers, SM allows for tangible references or hard copies of information that can be kept for patient and provider reference (Menachemi, 2011). Liederman, Lee, Baquero, & Seites (2004) noted that telephone calls to providers declined as SM increased, but at this point it is unknown whether patient or caregiver adherence to instructions was enhanced.

Communication using SM can also save money by avoiding unnecessary office visits. Zhou, Kanter, Wang and Garrido (2010) investigated the impact of SM on Healthcare Effectiveness Data and Information Set (HEDIS) outcomes. The authors found that use of SM in patients with diabetes, hypertension, or both was associated with a statistically significant improvement in effectiveness of care within a two-month time period. They also found SM was associated with an improvement of 2.0–6.5 % on other HEDIS measures such as hemoglobin A1C, cholesterol, and blood pressure control. SM is seen as being a technical change in health care as a patient-centered system which is thought to have an impact on quality improvement measures, thus it is critical to study its use.

SM is a technologic application that can facilitate communication between patients and nurses, and therefore logically falls under the aegis of nursing informatics. Nursing Informatics has been recognized as a specialty by the American Nursing Association (ANA) since 2001, (ANA, 2001). As such, nurses in this field can guide practice in informatics and specifically, based on findings from this study, in the area of SM. Additionally, informatics research studies can address consistency in nurses' practice, as well as impact the practice of informatics in other areas of health care.

Theory

This study contributes to theory by employing and building upon the theoretical framework of Ryan and Sawin's IFSMT (2009) using the model of self-management to provide context. The study contributes to the knowledge base of SM by placing it within aspects of the Individual and Family Self-Management Theory (Ryan & Sawin, 2009), but from a clinical perspective. The tenets of the IFSMT are not tested in this study,

rather context, process dimensions, and the factor of individual characteristics are employed to guide the study. Self-management also includes dimensions as specified by Gerteis et al. (1993) that patients should participate in decisions regarding the type of treatment they receive, that their family and friends should be involved in their care if the patient desires, the care should be coordinated and that communication, whether in person or via "web-based communication technologies" (1993, p. 32) should be efficiently and reliably received.

Research

Secure messages are an example of a relatively new technology available to consumers. As consumers continue to become more involved in their healthcare increasingly relying on internet information and communication, studies like this are needed to address consumers' needs in this changing environment. This study provides critical, initial information about how veterans' utilize messaging that is important to understand prior to undertaking further research related to SM.

SM is a technology being employed by more healthcare organizations, responding to the need for better privacy standards in an age of computer insecurity. Yet we don't have much evidence on the foundation or the outcomes of SM. The first step is to be able to provide some description and assessment of the use of SM.

Policy

The impact this study may have on policy is, at this point, local. The outcomes of this study may impact policy at the level of this particular hospital. This is the first time that SM has been studied using the controlled structure and needs of a unique patient population.

Findings from this study should impact patient education policies within the SM system. This study may potentially influence how healthcare team members use SM. Findings may also lead to further study of the financial cost of SM, based on message topics and involvement of health care providers. These results may influence changes to the SM program. Further, as the SM system evolves and the time providers spend in the system may increase, the study may serve as a reference for policies related to health care providers and SM.

Limitations

There are several limitations to this study. The numbers of SM studied are a valid sample but generalizations cannot be made to a larger sample or population (Polit & Beck, 2012). The study was undertaken at a VA in the Midwest, thus results are specific only to that site.

Chapter Summary

In this chapter the importance of patient-centered care mandated by many healthcare programs was highlighted. Secure messaging is an additional technology that is beginning to be utilized to assist in providing patient-centered care. No studies were found that focused on the content of patients' SM. Identifying trends within use of SM touches on nursing, other healthcare providers, consumers and their support systems, patient education, and a myriad of options and outcomes, yet this has not been investigated.

The study concepts were defined. Research questions were posed. The significance of this study to nursing practice and theory, nursing research, and nursing policy was outlined.

Chapter 2

Review of Literature

The purpose of this study was to describe topics discussed using SM, the pattern of use of SM, and whether the topics discussed and/or patterns of use vary based on gender and age of the SM user. In this chapter, the foundations of SM are examined to add a historical perspective to this topic and to follow the growth of technology related to communications between providers and patients. Additional dimensions that may affect the use of SM are reviewed; these include the effect of gender on healthcare, age, and internet use. A review of health issues, many of them chronic, in the V.A. population is included, to provide perspective on common problems they experience. An introduction to the use of the VHA's MyHealtheVet program is discussed as the portal to SM, to lend structure to the model of SM. Lastly self-management from various theorists is reviewed.

Information in this review is the result of electronic searches of computerized databases, library catalogues, journals, and texts used for academic and pleasure reading. To keep abreast of new publications the Internet Website Google Scholar's alerts query setting was helpful, designed to alert the investigator about journal articles related to the terms "secure messages" (SM), "self-management", "U. S. Veterans", and "consumer health informatics" (CHI). Additionally, Amazon.com routinely sends related updates of releases based on previous purchases.

The initial literature searches captured papers and texts published from 1990 through 2013. These searches included all of the following databases: HealthWatch®, which focuses on perspectives of health care and wellness, including more than 180

international and peer-reviewed journals and reports; as well as Medline, and the

EBSCOhost Research Database with full text, peer reviewed references, available

booklets, pamphlets, special reports and original research. The contents of these reviews

included indexes and abstracts dating back to 1984, and full-text versions of information

going back to 1990 (Hall, 1999). An additional literature search of the Medline and

EBSCOhost databases was done searching back to the 1950s for key items related to

initial studies of client/patient-centered care.

The Cumulative Index to Nursing and Allied Health Literature (CINAHL) was

also used as a comprehensive source of full text articles for nursing and allied health

journals. Three Cochrane sources were also used for literature searches: Cochrane

Central Register of Controlled Trials, Cochrane Database of Systematics Reviews and

Cochrane Methodology Register. Additional databases used for searches included:

Database of Abstracts of Reviews of Effects (DARE), Health Business Elite, Health

Source – Consumer Edition, Health Technology Assessments (HTA) and Library,

Information Science and Technology Abstracts (LISTA). Also used for searching were

MEDLINE with Full Text, NHS Economic Evaluation Database (NHS EED), and

Psychology and Behavioral Sciences Collection database, Rehabilitation and Sports

Medicine Source, and finally SocINDEX with Full Text.

The following entry terms were employed to obtain the broadest, most

comprehensive reference listing: "secure messaging; secure email; email and providers;

doctors; nurses; clinicians; messaging" and all variations of pluralized terms. Consumer

health information, CHI and information and consumers were used as search terms. The

Institute of Medicine's (IOM) Website was routinely reviewed, looking for new

information, as were the AHIMA and AMIA sites, the MyHealth*e*Vet (MHV) site, HarrisInteractive Website, and Pew Research. The term "Consumer Health Information" resulted in 23,267 articles or books found for the years from 2007 until March of 2013. The term "Secure Messaging" resulted in 766 journal articles from 1998 until the first quarter of 2013. Articles with titles or abstracts including the terms "email"; "messages"; "patient"; "nurse/nursing"; "provider"; "physician"; "secure"; or "security" were honed and focused to key points cogent to the study.

 Information is also presented regarding the theory on which this study is based. Self-management as a term was reviewed to remain informed of the latest research and publications. In order to obtain the most selective material for review, the newest journal articles and book sources were sought, and experts in the fields were chosen for their reviews.

Foundations of Secure Messaging

Findings of the literature review are presented to provide readers with a view of past history and the present state of knowledge regarding SM. The literature review begins with a grounding in the use and growth of technology, resulting in the field of CHI as the overarching term. Then the focus moves to the use of PHR by individuals. A discussion of the growth of electronic mail demonstrates the need and requirements to move into SM to protect personal health information.

As noted previously, use of SM and the PHR reflects a degree of self-management (Ryan & Sawin, 2009). Self-management and some of the theories that describe it are reviewed to further elucidate this theory. Though some theorists have

described self-management as early as the 1970s, the review of self-management

presented here begins in the 1990s.

The literature review includes additional information to provide a stronger

knowledge base for a discussion of SM. Thus information about the influence of gender

on healthcare is examined. Age is also discussed in relation to the use of technology.

The literature then focuses on veterans and research regarding veterans served by the VA

system. An introduction to the Veteran's Health Administrations' own system of PHR,

MyHealth*e*Vet (MHV) is explored and explained. MHV is the platform that houses SM

for veterans. Finally, points regarding of patterns of use are introduced to review the

literature as it relates to routines and habits.

Every attempt has been made to provide readers of this document with a thorough

platform of knowledge to grasp the structure and research around SM. Information

presented moves from overarching terms, such as consumer health informatics, to address

specific areas related to this study such as gender differences in health care.

Consumer Health Informatics

The term "consumer health informatics" is used to describe how consumers, and

thus patients, employ the computer to elicit health information (Eysenbach, 2000).

Observations concerning consumer health informatics (CHI) begin to appear in the

literature in 1995 and 1996 (Vaz, 1995). Refinement of the concept of consumer health

informatics resulted in a field that analyzes consumers' need for information, studies and

implements methods for making information accessible to consumers and integrates

consumers' preferences into medical information systems (Eysenbach, 2008). Consumer

health informatics experts study and implement methods of making information

accessible to consumers and integrate consumers' preferences into health information systems. Consumer health informatics can potentially empower patients to make informed choices (Dolan, Wolter, Nielsen & Burrington-Brown, 2009).

Findings from a review of the CHI literature by the Agency of Healthcare Research and Quality (Gibbons et al., 2009) reveals that using CHI applications could help improve health care processes such as medication adherence, and serve as an "early warning system" to practitioners for patients with declining clinical conditions. Gibbons et al. (2009) further indicated that Internet users with chronic health issues, such as those with cancer, diabetes and mental health disorders, benefit from using patient-focused electronic tools to support health improvement. The authors suggest that CHI applications may engage consumers and enhance traditional clinical interventions as well as improve both intermediate and clinical health outcomes.

Xie (2009) discussed the use of CHI by adults greater than 60 years of age with respect to face-to-face encounters with medical professionals. Xie looked at consumers' perceived need for health information and proposed that the Internet has broadened options and venues used in decision making. Xie asked individuals in discussion groups how best had they had their questions regarding health information answered: by their provider or through use of the Internet. The answer was a combination of the two. Xie suggested that the use of the Internet has not changed older adults' reliance on medical professions for health information—though the author suggests that some of that reliance is perpetuated by the providers. Based on his findings however, he noted that older adults have a continued preference for reliance on individual healthcare providers as the source of their healthcare information needs. This author did not support use of CHI for

adults over the age of 60, who, according to Xie, obtain better health information from their provider than from the Internet.

Adams (2010) provided insight into consumers' use of health information online. The author suggested that health related institutions, agencies, and web designers exercise caution in the development of CHI. The author reviewed the use of implicit and explicit blogging on specific blog-sites as a case study example. Bearing in mind that blogs themselves often contain subjective information, *implicit blogging* was defined as the use of blogs available to the general public on health-related issues or practices, such as exercise, nutrition, and weight loss. The author defined *explicit blogs* as those designed with a particular health situation in mind, such as pregnancy, leukemia and included Internet sites directed at self-management of a disease such as diabetes. Two case studies were developed to present trends in CHI—one looked at open documentation on an implicit blog related to general weight-loss. The other case study, an explicit review, evaluated a health website associated with specific diseases that afforded users an Internet location to record their medical information and experiences. Based on the reviews of the websites and users, the author cautioned developers to examine interactive website from users' perspective to determine importance and evaluate their methods of using the sites and why they are used. Adams suggested that further investigation into online CHI use needs to occur and should be grounds for future research activity not only by healthcare providers but also by insurers, health-related businesses, and policy makers.

Consumer health information is an area showing significant growth within the Internet, as well as the medical and nursing literature. Fox (2013) reported that 81% of American's have access to the Internet and 72% of adults with access have looked online

for health information in the previous year. Pew Research also reported that 19% of

smartphone users have downloaded an application or "app" to either track or to manage

their health (Fox, 2013). Gibbons et al. (2011) point to the fact that consumers bring

intelligence, access, and a myriad of issues to CHI. These three analyses all note the

increasing use of health information searches by consumers in a positive and beneficial

manner.

In the literature, CHI is viewed most frequently as an area that has grown in use,

but not necessarily in comprehensibility or accuracy. Only Xie (2009) pointed to a

preference in older adults for finding health information directly from their providers.

Another study related that users of CHI search utilizing the Internet and CHI applications

such as WebMD, WebMD Baby, WebMD Allergy, Pregnancy, Pain Coach, Medscape,

Medline Plus Connect (Burgess et al., 2012) and more Websites that have proliferated as

applications on mobile phones and as websites become increasingly available to

consumers.

Personal Health Records

A discussion of use of SM by patients requires a brief look at computerized

personal health records (PHR), as several of the PHRs such as the MyChart® program

attached to the Epic® electronic health record (EHR) include the option of SM

(Bushhousen, 2013). The security of the platform on which the PHR is built enables the

safe use of messaging between provider and patient, or not, as has been shown (Beard,

Schein, Morra, Wilson & Keelan, 2012).

A personal health record can be a paper based tool or may be accessed through a

personal computer or housed on an Internet web site (Zulman et al., 2011). Some PHRs

are stand-alone systems (Do, Barnhill, Heerman-Do, Salzman & Gimbel, 2011). These are referred to as unidirectional systems and only the consumer inputs information for record keeping. Other PHRs are bidirectional and may interact or upload patient information to a health-system-based electronic health record (EHR) (Martino & Ahuja, 2010). This type of PHR is housed within a larger healthcare network where providers may view the information and the patient may view or add information to the larger, health center-based medical record (Emani et al., 2012). Some PHRs, such as Kaiser Permanente's My Health Manager®, allow consumers to communicate with providers to refill prescribed medications, view dates for upcoming healthcare appointments, and access portals for medical information and education through the use of electronic mail (Kaiser Permanente, 2009). MyHealth*e*Vet has similar features.

There is an increased financial incentive for physicians and hospitals to adopt EHRs and this is referred to as "meaningful use" (Diana, Kazley, Ford, & Menachemi, 2012). Meaningful use is defined as EHR use by providers to achieve significant improvement in care (Blumenthal & Tavenner, 2010). Eligible professionals can receive up to $44,000 through the Medicare EHR Incentive Program and up to $63,750 through the Medicaid EHR Incentive Program (Blumenthal, 2010) towards purchase of an EHR. Through the Health Information Technology for Economic and Clinical Health (HITECH) Act, the federal government is making this money available in incentive payments to providers and hospitals (Glaser, 2010). HITECH began in 2011, yet incentives will be offered until 2015, when penalties may be levied for failing to demonstrate use of EHR technology (DesRoches, Worzala, & Bates, 2013). The increase in EHRs will concomitantly increase the number of tethered PHRs.

To assist consumers who may receive healthcare services from multiple providers and sites, several countries' healthcare organizations support the *universal serial bus* device (USB) for patients to use as a PHR. Sometimes referred to as a thumb drive or jump drive in the United States, a USB maintained PHR in Spain, the United Kingdom, Australia and Japan allows patients to carry their PHR with them (Jara, Zamora, & Scarmeta, 2011; Jian et al., 2012; Steele, Min & Lo, 2012).

In the generic sense, and in the U.S., personal health records (PHRs) are files created and maintained by an individual patient or consumer, based upon the individual's understanding and recording of their health condition, allergies, medical and surgical problems, medications, medical tests and procedures (Zuckerman & Kim, 2009). A PHR differs from an electronic health record (EHR), in that an EHR is maintained by a provider or provider organization as part of a large database containing records of all patients or consumers within the group, whereas a PHR is maintained by the individual (Schnipper et al., 2012). Presently, the VA's MHV combines some EHR data with SM and PHR capabilities, and is a bidirectional system with a high level of security.

The first computer-based PHRs appeared in the late 1990s in the form of consumer oriented Web sites (Brennan & Starren, 2006; Hunter, 2002). Consumers were charged a fee to assemble and deposit their own healthcare data into these Web sites. The majority of the early PHRs did not prosper. Of the 27 PHRs identified by Kimmel, Greenes, and Liederman (2005) in existence in 2000, only seven remained less than three years later. Yet today, the use of electronic PHRs is increasing (Zulman et al., 2011). Overall, Markle Foundation (2011) reports the use of PHRs has increased from 3% to 10% since 2008. Kaelber, Jha, Johnston, Middleton, and Bates (2008) report that nearly

fifty million people have access to MyChart®, a PHR tethered to Epic® System's EHR, and another twenty million veterans access the VHA's PHR. Thus evidence supports the increased use of PHR by the American public.

One reason for the increase in the use of PHRs is that health care institutions are now beginning to develop electronic PHRs that enhance patient centeredness by allowing users to review medical test results, encourage medication refill requests and permit clinical messaging with providers (Emani et al., 2012). As a result, proprietary industries have begun to spend significant time and money forecasting the future of PHRs (Lewis, 2011, Pirtle & Chandra, 2011) and sometimes, as in the case of Google Health (Lewis, 2011), are wrong despite their best planning. Quoting federal healthcare reforms that call for specific care options to set the stage for a "tipping point" leading consumers toward rapid adoption and reliance on personal health information management resources, Frost and Sullivan (2011), a firm that provides customer-dependent market research and analysis along with growth strategy consulting, suggested it is time to venture into the PHR market both in the US and abroad. Other organizations such as Blue Cross/Blue Shield, and the American Medical Association (AMA), also rate the advantages of PHRs (BCBC, 2012; Jones, Shipman, Plaut & Selden, 2010, Wilson, 2008).

Security of the health record itself can be an issue when a PHR is maintained via the Internet. By placing secured personal health data on the Web and allowing patients and providers to access them, PHRs create an infrastructure for the productive sharing of health information, but also the potential of sharing with unknown others as well. Personal health records that are tethered to any healthcare network or provider must follow all requirements of the Health Insurance Portability and Accountability Act of

1996 (HIPAA) (Jacques, 2011; OCR, 2000). That is not the case with a stand-alone, un-tethered PHR. When using an electronic PHR, multiple individuals such as caregivers and family members may add and view information to the record. What of others who may inadvertently or maliciously gain access to another's record?

PHRs are a melding of technology and CHI. With a PHR, a patient may review medical test results, refill medications, and some systems allow direct messaging with providers. This review of the growth of PHRs is important to understanding the current study and the method of SM used in this study. SM requires a PHR that can securely maintain the privacy of personal information of the message. Security of the PHR in the current study was assured using a tethered EHR.

Electronic Mail

Electronic mail, more commonly referred to as email, has been employed in health care for some time. Its use has been traced to the year 1972. An example of an early adapter, Luckett (1973) writes in the journal *Popular Science* of the use of electronic mail by a physician in the previous year's issue; he described the electronic mail and likens it to "a dream world thought not likely to be experienced in our lifetimes". Referred to as electronic mail, Luckett described a system that used telecommunications to transmit letters, pictures, graphs, and invoices that "look just like the original".

More than 20 years after Luckett, Pallen (1995) argued for the use of electronic mail in healthcare and listed beneficial effects of communication via email for medicine, nursing, and other clinical settings, noting that it can reach its destination in minutes thus obviating the need to purchase a stamp. Additionally, Pallen noted that junk email was

so rare, that "reading email requires barely any time" (Pallen, 1995, p.487). In the British

Medical Journal, Pallen detailed how to make one of the most common emoticons, that is

"smileys", and at that early date suggested the use of an encryption system to maintain

patient privacy. Also in 1995, Coiera asked colleagues to increase research in the arena

of human communication processes to improve delivery of health care using email.

In 1998 potential issues related to electronic patient-physician communication

were being discussed (Mandl, Kohane, & Brandt). Though touting convenience of email

and benefits of involving patients in their own health care, the authors also raised issues

related to confidentiality. Mandl, Kohane and Brandt furthered the discussion of public

keys to protect patient information. Shortly thereafter the U.S. Department of Health and

Human Services (HHS) began the process of establishing standards for health

information (Gostin, 2001) that impacted email: the use of public keys became required

in all segments of the health care industry in 2001. Encryption of personal health

information is now required to protect personal information through the use of private

and public keys (Henry, 2007).

In the year 2000, the online journal, *Journal of Medical Internet Research* was in

its third year of existence. In it, two articles were of note. The first was a review of

anesthesiologists' responses to an unsolicited email sent to them from an unknown

patient (Oyston, 2000). Fifty-four percent of the anesthesiologists responded to the

message sent from a person unknown to them giving some type of advice, 78% of them

within 48 hours. Oyston warned of the potential for malpractice in offering advice to

unknown people. In a discussion in that same issue, Kuszler (2000) cautioned physicians

of legal issues resulting from responses to unsolicited email messages. The author

reviewed common law legal risks of responding and offering advice or diagnostic

suggestions to patients through use of email. Additionally Kuszler suggested that email

holds promise as a mechanism by which to review patient progress and response to

treatment.

There has been considerable discussion in the literature about the need for

specialized security to protect patient privacy when using email (Ahern, Woods,

Lightowler, Finley, & Houston, 2011; Argawal, Anderson, Zarate, & Ward, 2013;

Ralston et al., 2009). Mattison (2012) discussed the risks and benefits of email

correspondence with patients in clinical social work practice. Though no evidence was

presented supporting one approach over the other, Mattison suggested academic training

courses to improve techniques with communicating electronically with clients.

Kane and Sands (1998) published a list of best-practice recommendations for use

of email. Their work was the outcome of a task force within the American Medical

Informatics Association (AMIA) charged to develop guidelines for the use of clinic and

patient electronic mail. These guidelines were later adopted by the American Medical

Association (AMA) and included the use of privacy and encryption, printing and filing a

copy of message and response, avoiding anger, sarcasm, instruction of patients to place

category of transaction in subject line such as prescription, appointment, billing issue,

and other cautions. A review was then made of the messages sent by physicians to

determine if they had followed best-practice guidelines for use of email (Menachemi,

Prickett, & Brooks, 2011). Messages from 2005 were compared with messages written in

2008 and the physicians themselves were queried. Respondents from a group of 7,000

physicians reported use of email, increasing from 16% to 20% over four years' time.

Physicians who reported using email "frequently" did not change; that number remained at 2.9%. Those who did not use email were asked of their future plans to do so. Compared with earlier results in 2005, a greater proportion of physicians in 2008 indicated not being interested in using email in the future; 53% in 2005, increasing to 58% in 2008. Women physicians were more likely to use email than physicians who were men. Comparison of best-practice categories between 2005 and 2008 demonstrated that rates of use of the guidelines *de*creased in each of the 13 categories and significantly decreased in 2008 for four of the guidelines. No reasons were given for the variability in the use of email and the abandonment of guidelines for email messaging.

Not only has email use been investigated but so too has content included in email messages. Sittig (2003) reviewed email for a branch of Kaiser Permanente Northwest. The purpose was to measure the workload encountered by clinicians as a result of messaging, to count the number of words in each messages, and to determine if the requests of providers by patients were fulfilled. At the time of the study all messages were transferred via standard email protocols, thus they were unencrypted. Also, all employees could login, read, and respond to providers' messages, that is the system was not secured. At an earlier time, 1999, and not connected to this study, another group of researchers developed a taxonomy of patient requests within the Kaiser Permanente system. This taxonomy amounted to identification of 11 varying requests for information, eight requests for action and eight categories of physician replies. These were examined and found to be useable in this 2003 review of patient/provider emails. Five physicians agreed to participate in the study. Sittig analyzed the content of all messages; counting words in each message, the type of request, and number of requests

made by patients. The physicians received a mean of 40 messages in the month. The

mean number of messages from any single patient was 1.5 messages. The content of the

message contained 139 words. Patient request fell mainly into three categories: 26%

were requests about medications or treatments, 22% were request about symptoms or

diseases and approximately 20% were request for actions regarding medications (e.g.

"I'm running out of this medication"). The other findings of reasons for requests were

not mentioned in this review. With a low level of evidence, the author concluded that

email would save office visits and physician time.

White, Moyer, Stern, and Katz (2004) reviewed email communication between

patients and providers at the University of Michigan. One aim was to investigate the

purpose of patients' email messages to their providers, that is, administrative versus

clinical themes. Secondly the authors wished to determine if the content and tone of the

messages were appropriate, that is formal, informal, courteous or other. White, Moyer,

Stern and Katz reviewed a total of 273 messages to determine if patients followed the

specific guidelines the authors had developed to improve email use with their providers.

The authors stated that due to the year of the study there were no encryption protocols

used, thus no secure messaging occurred. Patients were simply advised to not discuss

sensitive issues when emailing providers. White, Moyer, Stern and Katz found that over

40% of the 273 messages were "updates on condition" to their physician. Prescription

refills accounted for 24% of the messages. Questions about procedures comprised 13%

of messages while requests for referrals were 9% of message texts. The category of

"other" accounted for 9% of messages and included thanks and apologies from patients,

while only 5% of the messages were requests for appointments. The reviewers found

content and tone appropriate and that nearly all messages were limited to a single request. The authors concluded that email as a tool would grow to be used by patients and providers in appropriate ways in the future and would improve efficiency and effectiveness in medical care.

Mittal et al. (2010) studied email communication skills in rheumatology fellows. The purpose of the study was to determine the quality of the fellows' responses to a simulated email question to measure the level of communication skills and professionalism in each fellow's reply. Content of messages was scored on an 18-item instrument. The instrument included the content of the AMIA/AMA recommendations mentioned by Kane and Sands (1995) as well as several additional items such as backup of information, not sharing professional email accounts with family, telephone number and other points. The maximum achievable score was 18. The average score received by fellows was 10.6, with a range of 3-16. Most messages were found to be concise, but not formal in tone. The authors cautioned that though emails were to be for non-urgent requests, it is possible that serious situations could arise via email and result in medical liability. In this study, 92% of fellows identified the medical emergency but only a third made an active effort to resolve the issue by calling the patient themselves or by the office staff. Less than one third of the medical fellows offered a telephone number for follow-up. The outcome suggests that communicating via email is not an intuitive skill. Also, as was mentioned in the review by Mattison (2012), the suggestion was made that there was need for education for clinicians to learn how to respond to email messages and that further assessment of provider skills should be made.

Zhou, Kanter, Wang, and Garrido (2010) studied patient outcomes at Kaiser Permanente. The investigators reviewed email communication using a more secure email system. The sample of email communications was drawn from patients with either diabetes or hypertension and their providers. The investigators measured nine outcomes to determine if they met the Health care Effectiveness Data and Information Set (HEDIS) criteria. The use of email between clinicians and patients was associated with improved HEDIS measures ($p<0.0001$) of 2.4% to 6.5% improvement on hemoglobin A1C screening and control, low-density lipoprotein screening and control, renal screening and nephropathy screening.

The evolution of email use in healthcare since the 1990s brings this topic into focus for this study. From simple beginnings, studies reflect providers not wishing to engage in email technology as reported from mid-2000s by Menachemi, Prickett, and Brooks (2011) to an improvement in health outcomes through the use of email in the Zhou, Kanter, Wang and Garrido study in 2010. Security while writing messages has been stressed since the beginning to protect patient privacy (HHS, 2000). Messages have been studied to ascertain how physicians respond to email messages from hypothetical patients. Of particular interest is work from 2004 by White, Moyer, Stern, and Katz. Those authors reviewed 273 email messages between patients and providers and reported that the majority of messages written by patients were updates on their status while almost a quarter of those email messages were requests for prescription refills, demonstrating a trend in what types of information patients feel comfortable handling via email.

Factors associated with SM

Many factors may influence the use of SM in health care (Adams, 2010; Cohen et al., 2010; Xie, 2009). This study is based on SM utilized within the VHA. While it is still true that a majority of veterans obtain health care outside the VA, most veteran research is conducted in VA health care settings (Washington, Sun, & Canning, 2010). Two characteristics that can be used to describe the population that may use SM when seeking care are veterans of various age ranges and by gender.

Gender and health care. Women make the primary health care decisions in two-thirds of American households (Walter, 2012). They account for 93% of all over the counter pharmaceutical purchases (Skoloda, 2009). Women are more likely than men to choose the family's healthcare insurance (Kluger, 2010). Gender differences in health care are reported throughout the literature (Crimmins, Kim, & Solé-Auró, 2011; Cylus, Hartman, Washington, Andrews, & Catlin, 2010; Martinez et al., 2012; Mattocks et al., 2011; McDermott et al. 2011). Review of statistics in 2006 indicated that nationally, 22.8% of men and 11.8% of women did not make health care visits to a provider's office, emergency department or utilize home visits (Pinkhasov et al., 2010).

Women's health contributes a large proportion of the cost of national health care overall, not solely in veterans (Owens, 2008; Pinkhasov et al., 2010; Shen, 2013). Reproductive health generates 16% of overall health plan costs, which is more than cardiovascular disease, diabetes, and asthma combined (Owens, 2008). Women, on average, live five years longer than men (Moller, Fincher, & Thornhill, 2009). There is no significant difference in obesity between genders, however the National Health and Nutrition Survey found a significant increase in obesity in those over the age of 60 as

compared to those younger (Ogden, Carroll, Kit & Flegal, 2012). In 2010 the American Heart Association reported that since 1984, the number of CVD deaths for women has exceeded those for men. From 1996 to 2006, death rates due to CVD (ICD-10 I00 –I99) declined 29.2%. In the same 10-year period, the actual number of CVD deaths per year declined 12.9% (Lloyd-Jones et al., 2010).

Because of the longer life expectancy and the increased incidence of stroke with age, older women, veterans and non-veterans, are more likely to bear the morbidity of stroke related disabilities (Silva et al., 2010). More women than men suffer recurrent strokes within five years of their first stroke in all age ranges greater than 40 years (Persky, Turtzo & McCullough, 2010). In 2005, stroke accounted for 1 out of every 17 deaths nationally, but women accounted for 60% of the stroke deaths (Cherepanov, Palta, Fryback, & Robert, 2010).

Autoimmune diseases are a group of 80 different inflammatory disorders that are reported to be steadily increasing in veterans and non-veterans (Dube et al., 2009). Nearly 5% of the world's population develops an autoimmune disease and of this number almost 80% are women (Fairweather, Petri, Coronado & Cooper, 2012). Hormones, specifically estrogen, progesterone and prolactin, are found to play a significant role in the development of these diseases (Quintero et al., 2012). Systemic lupus erythematosus may appear or exacerbate during pregnancy. Conversely, treatment with estrogen protects postmenopausal rheumatoid arthritis patients from active forms of this disease and osteoporosis (Walker, 2011). The prevalence of lupus and scleroderma is higher in the U. S. than in other countries, while rheumatoid arthritis is more prevalent overall in North America as compared worldwide (Oliver & Silman, 2009).

Women play an increasing role in the U. S. military and represent 15% of the active military personnel, 17% of the reserves (including National Guard) and 20% of all new military recruits; they are also one of the fastest growing groups of new users in the VA (Mayberry et al., 2011). Women veterans were reported to be studied mainly by VA funded sources or by Department of Defense (DoD) funding and the majority of research to date has addressed post-traumatic stress disorder, sexual harassment and assault, or psychiatric conditions (Goldzweig, Balekian, Rolon, Yano, & Shekelle 2006). A similar review in 2009 by Yano et al., demonstrated that those areas being researched had not changed over time. Two investigators reported on women and military sexual trauma and their ability to cope with military experiences (LeardMann et al., 2013; Koo & Maguen, 2014).

Several studies identified that women veterans are not fully knowledgeable about access to VA services (Mattocks, et al. 2011; Shen & Sambamoorthi, 2012; Yano et al., 2009). These and another study pointed to the fact that the majority of women veterans obtain their health care outside the VA (Washington, Sun, & Canning, 2010). Military sexual trauma and depression are more prevalent among women than in veterans who are men, with nearly half (48%) of all women veterans studied having screened positive for depression (Haskell et al., 2010). However, in this same research, women veterans also screened lower for increased body mass index and were less likely to screen positive for post-traumatic stress disorder. Women reported a significant problem when reintegrating into their lives post deployment (Cohen et al., 2010; Mattoks et al., 2011). The airing of sexual trauma within the military in multiple media outlets (Almsay & Fantz, 2013;

Steinhauer, 2013; Thompson, 2013) will undoubtedly and hopefully lead to further

research and insight into problems that surround women in the military.

Differences between common diagnoses related to gender may impact women's

use of the SM system at VA hospitals. It is not known if women use the SM system

differently than men, if messages contain topics that vary from men and other factors yet

to be determined. Thus, it is imperative to determine if there is a relationship between the

use of SM and gender.

Age. In 2010, McInnes, Gifford, Kazis and Wagner conducted a secondary

analysis of data from a 2002 national survey of more than 8,000 people that included an

oversampling of veterans, (*N*=3408). They found that 29% of veterans had used the

Internet to search for health related information in the previous year. In their review

younger-age, higher income, more education and better health status were positively

associated with general Internet use, while education, urban living and a lower health

rating were associated with an increased in health-related Internet use.

The digital divide for use of technology, ability to navigate the Internet, and

access to computers and technology has been described as the gap between the

'technology haves' and the 'have-nots' (Sipior & Ward, 2013). Census data for 2009

details that 23.5% of 40 million non-institutionalized adults 65 years and greater are

unable to ambulate and 15.8% have an independent living disability (U.S. Census

Bureau, 2013). Those are unprecedented numbers. Of these, only 34% of those less than

60 years of age and only 17% of those greater than 60 use the Internet (Choi & DiNitto,

2013). Many of those with the Internet access reported that they had discontinued its use

due to cost and/or disability. Thus, the digital divide is apparent in this group of adults.

In contrast to Choi and DiNitto (2013), other research reports that use of the Internet by older Americans is growing. The Pew Internet group reports that as of April 2012, 53% of American adults aged 65 and older use the Internet (Zickuhr & Madden, 2012). Further information in the Pew findings includes the fact that 70% of adults use the Internet daily, but those 76 and older only 34% use the Internet daily. Further, Zickuhr and Madden report that Social Networking among seniors has grown to the point where 34% of Internet users 65 and older use social networking sites and 18% of them do so daily.

Ralston et al. (2008) actually studied SM in an integrated medical practice. Review of users of the program revealed that SM users were more likely to be women between the ages of 50 and 65 years, and less likely to be insured by Medicaid. The best predictor of use of SM was for patients with the greatest overall morbidity.

In summary, understanding the current state of science is critical to understanding the proposed study. In this section, the review began by explaining what is known about the science of veterans as a group; the literature review next highlighted the specific personal health record used by veterans, MyHealtheVet. It is important to understand how the MHV record is used to access SM, within the security of the MHV program. To further define variables in this research, gender and age were reviewed in the bigger framework of health and in the use of technology; women tend to spend more in terms of healthcare finances and women veterans have specific issues within the system. Age was also reviewed as part of the science of veterans and age has some impact as well on the use of technology; the older generation, specifically veterans, may not have the same degree of sophistication in the use of technology yet they are being asked to develop the

motivation and skills in order to use the service that is SM. Few have examined SM in conjunction with gender or age. This research becomes a foundational study in the evolution of the understanding of SM.

Habits and Pattern of Use

Habits are a form of automaticity in responding that develops as people repeat actions in stable circumstances (Verplanken, 2006). In multiple studies early in the 20th century, readiness to learn a habit was demonstrated to be a native ability in rats (Yoskioka, 1930). Habits have been further defined as a stimulus-response association, devoid of mental representation (Neal, Wood, and Quinn, 2006). Orbell and Verplanken (2010) define three aspects of habits as being central to the definition: behavior that is frequently repeated, has acquired a high degree of automaticity, and finally is cued in stable contexts.

Repeated patterns regarding health may be damaging, such as cigarette smoking. Other repeated patterns may promote health such as eating a variety of vegetables or using the computer to communicate with health care providers (Orbell & Verplanken, 2010). The method of repeated patterns or habits demonstrates a pattern of use, reflective of healthy or unhealthy behaviors. The habit of using SM could be considered a healthy behavior. Patterns of use may be indicative of a habit, and some could argue that a habit results in repeated patterns of use.

Habits are thought to originate in the basal ganglia (Yin & Knowlton, 2006), specifically the striatum. The review of habits by Neal, Wood, and Quinn (2006) presented habits from one of three possible perspectives. The first perspective is that habitual control is the result of direct context cuing, where repeated activation builds

links in memory between context and response, an example of which would be that the stereotype of being elderly and the associated behavior that elderly people maintain a slow speed of walking. Neal, Wood, and Quinn's second perspective is that habits are implicit-goals where habits develop when people pursue a goal via a specific behavior in a specific context. Thus, those who exercise as runners will not generally pursue a class in cycling. The third perspective is the motivational value that was learned as a response to a previous reward. An obvious example of this is that of Pavlov's dogs who salivated with the appearance of the coat of the assistant who brought in food, rather than to the food itself (Zernicki, 1987).

There are two reports of research related to Internet use and time spent online (Cotton, Goldner, Hale and Drentea, 2011; Beutel et al., 2011), but none of these directly look at the habits of users. The overwhelming theme found in these authors' works has to do with negative influences of the Internet on the health of the computer user. No authors were found who study the use of Internet as a habit.

Another component of the research questions within this study is the concept of the pattern of use of SM. Pattern of use as used in this study is an exemplar of any routine use or more succinctly, the specificity of Internet use by veterans while employing SM. Patterns of Internet use was mentioned by Shah, Kwak and Holbert (2001) in an attempt to differentiate between the numbers of hours spent on line versus the pattern of the use. These authors looked at the pattern of use of the Internet as related to civic life, not related to time of day or day of week. Shah, Kwak and Holvert discovered that use of the Internet was positively related to individual differences in the production of social capital.

Pattern of use of SM was not found to have been reviewed in the literature in the manner that the term is used here, specifically the dates and times that SM is initiated by patients. Ralston et al. (2008) reviewed use of secure messaging and found that the patterns of higher *internet* usage overall across the country was associated with a younger population. However, that was not reflected in the use of SM by Ralston et al., who determined those between the ages of 50 and 65 years were the greatest users of SM.

No authors looked at a pattern of use as defined as, for example, the use of the SM or even the Internet as a whole, on Mondays versus Saturdays or noon versus midnight usage. No studies were found that reviewed this specificity of information. Thus this study will provide initial information about pattern of use of SM by veterans.

United States Veterans Health Issues

Articles regarding the Veterans Administration and veterans are frequently in the daily news. At this time, allegations of lack of processing of disability claims are in the news (Briggs, 2012; Maze, 2013), thus not all information in the literature is complimentary. Research including veterans captures both positive and negative perspectives of the largest integrated healthcare system in the U.S. (Gellad, Mor, Zhao, Donohue, & Good, 2012). Health care issues experienced by veterans are explicated in this section.

There were approximately 18 million veterans in 2013 and approximately 8.3% were women (Department of Veteran Affairs, 2013). According to the National Center for Veterans Analysis and Statistics, as of June 2012, there were more than 8.5 million enrollees in VA healthcare system. More than three million of these were receiving VA

disability compensation. The Department of Veterans Affairs is comprised of 152 VA hospitals and it maintains 817 VA Community Based Outpatient Clinics or CBOCs.

Much of the research on healthcare utilization done in the last 10 years has been directed at veterans returning from Iraq and Afghanistan. As the review of U.S. veteran issues continues forthwith, it is helpful to understand the periods of conflicts being discussed most frequently. A report to Congress by Torreon dated December 2012 assists in putting current/recent conflicts in perspective. The dates of Operation Enduring Freedom (OEF), which included troops in Afghanistan and in other nations, began with U.S. military forces being deployed 10/7/2001 and are the location from which the drawdown of troops is currently occurring. Operation Iraqi Freedom (OIF) began on 3/17/2003 and on 8/10/2010 President Obama formally announced that the mission had ended.

Suicidal ideation among active duty members began to receive national attention in 2004 with several high-profile cases of veterans who killed themselves after returning home (Kleespies et al., 2011). McCarthy et al. (2012) found significant differences in rates for both rural and urban suicides among veterans. Veterans (versus all individuals) in rural areas were associated with higher suicide rates: 39.6% versus. 32.4% per 100,000 person-years in fiscal year (FY) 2007-2008. A rural residence was associated with greater suicide risks, as much as 22% greater, in FY 2007-2008. Firearm deaths were the most common in rural suicides (76.8% vs. 61.5%) in the same time period.

Cohen et al. (2009) report that, in a review of 249,000 returning veterans with at least a year of VA healthcare, 21% of the returning OEF/OIF veterans had received mental health diagnoses; the most prevalent was post-traumatic stress disorder (PTSD).

The next most prevalent diagnosis was depression at 18.3%, adjustment disorder (11.1%), anxiety disorder (10.6%), substance use disorder (8.4%), and alcohol use disorder (7.3%). PTSD was more common in veterans who are men and in younger veterans. Mental health diagnoses other than PTSD were more common in women veterans. Veterans of lower rank and those who served in the Army and Marines were also more likely to be diagnosed with PTSD. Additionally, those with mental disorders had a significantly (p<0.001) greater utilization of all types of non-mental health outpatient, emergency, and inpatient medical services than those receiving no mental health diagnoses. Veterans diagnosed with PTSD had the greatest utilization in all service categories.

Peskind et al. (2011) studied repeated blast exposure and post-concussive symptoms. They found that impairments in verbal abilities, cognition speeds, attention, and working memory were similar to findings in patients with cerebellar lesions. Based on evidence for a link between PTSD and diminished health status, Hepper et al. (2009) studied a sample of both men and women veterans, with data corresponding to five factors linked to metabolic syndrome. These factors included blood pressure, waist-to-hip ratio, and fasting measures of high-density lipoproteins (HDL) cholesterol, serum triglycerides and plasma glucose concentrations. Inspection of findings indicated that the greater the severity of PTSD, the higher likelihood of metabolic syndrome. This is of importance in that metabolic syndrome has been shown to predict cardiovascular-related morbidity and mortality.

Elbogen, Johnson, Wagner, Newton, and Beckham (2012) analyzed data from 1,388 OEF/OIF veterans, asking about employment, annual income and debt, and used

the Quality of Life Index (Keyes, Fredrickson, & Park, 2012) to measure veterans ability to make ends meet and cover basic needs. Nineteen percent reported at least a general equivalency or high school diploma, 35% reported some college coursework, and the remaining 46% had college degree of at least an associates' level. Eighty percent were enlisted personnel and 15% were officers. Of those screened, 20% screened positive for PTSD, 17% met criteria for traumatic brain injury (TBI), and 24% had symptoms meeting criteria for major depressive disorder (MDD). The median annual income of respondents was approximately $50,000 with 78% reporting some employment in the previous year. Seventy-two percent of participants were satisfied with their financial situation, while 58% stated they were always able to afford food, clothes, housing, medical costs, and social activities. Yet 43% also indicated that treatment costs were a barrier to obtaining psychiatric care. During the previous year, 13% had lost a job, 15% had written bad checks, and 21% had been referred to a collection agency. Veterans with probable MDD, PTSD or TBI were substantially less likely to have money to cover expenses for clothing and social activities than others and were more than twice as likely to have been referred to a collection agency. Inspection of these data revealed that veterans are at risk for experiencing not only mental health issues but quality of life issues.

Perl, in a report to Congress (2011) reported that nearly 137,000 veterans were homeless on at least one night for FY 2008-2009. On a single night in 2009, in January, 75,609 veterans were homeless. Fargo et al. (2012) also studied homelessness in veterans. Their review found that veterans are overrepresented among the homeless in the U.S. and are at greater risk than nonveterans of becoming homeless. A review of

seven areas of the country (New York City, San Jose/Santa Clara counties in California, Columbus and Franklin counties in Ohio, Denver and surrounding counties in Colorado, Tampa/Hillsborough County, Florida, Phoenix and Maricopa county, Arizona and Lansing/Ingham County, Michigan) using American Community Survey (ACS) data, resulted in findings of 130,500 homeless adults. Of that number, 10,726 (8.2%) were veterans. Veteran status, greater than 45 years of age, and black race were significantly and independently associated with risk of homelessness among both men and women.

Thorpe et al. (2012) examined the influence of veteran status in a sample of older adults with the diagnosis of schizophrenia or those having a schizoaffective disorder. Patients in the San Diego, California area were recruited to participate in the study. The veterans (n=373) were slightly older than the non-veterans (n=373), more likely to be married, and less likely to live in a board-and-care type of facility. There was a significant difference found between the groups regarding age at onset of schizophrenia or schizoaffective disorder, with veterans having onset later (at 27.6 years) than non-veterans (at 24.9 years). Fewer of the veterans than non-veterans indicated drinking alcohol in the morning or using most substances (sedatives, cannabis, stimulants, opioids, and hallucinogens) during the first three months preceding enrollment in the study. Veterans did report a worse quality of life score related to physical functioning versus non-veterans. However, veterans performed better than non-veterans on the performance measure of everyday functioning and cognitive tasks.

Pracht and Bass (2011) looked at avoidable hospitalizations at Florida's VA hospitals. The sample consisted of 284 veterans receiving care only at a VA and who had been hospitalized at least once for an avoidable reason, that is, the stay should have been

treated on an outpatient basis. The objective was to examine the relationship between utilization of ambulatory care and the probability that an individual was re-hospitalized for the same, avoidable reason. The investigators found that veterans who received at least one ambulatory care visit within a month of discharge were less likely to experience re-hospitalization.

Other positive outcomes for veterans included the results of Zullig et al., (2012) who studied cancer incidence between veterans and the general U.S. cancer population. Veterans cared for in the VA are older, sicker and of lower socioeconomic status that the overall U.S and veteran population as a whole. Yet VA patients were diagnosed at an earlier stage of disease for lung, colon, and prostate cancers, relative to the general population. The researchers found the most commonly diagnosed cancers were similar in both groups (prostate, lung, colon/rectum, bladder, and skin melanomas. These findings we supported by Landrum et al. (2012) who compared survival rates for men older than 65 years diagnosed or received their first course of treatment for colorectal, lung, lymphoma, or multiple myeloma with similar fee-for-service, Medicare enrollees. The veterans had a higher survival rate of colon cancer and non-small-cell lung cancer. Veterans had similar survival rates of rectal cancer, small-cell lung cancer, diffuse large-B-cell lymphoma and multiple myeloma. Landrum et al. found that diagnosis of veterans at an earlier stage explained much of the survival advantage for colon cancer and non-small-cell lung cancers.

Finally, in relation to the present study, Houston, Volkman, Feng, Nazi, Shimada, and Fox, (2013) reviewed use of the Internet by U.S. Veterans. Inspection of results suggests that veterans represent a key population who utilize health services via the

Internet. Veterans in VA are more likely to search for health issues related to Alzheimer's disease and memory loss ($OR = 3.07$; CI = 1.41-8.28) compared to Veterans not in VA. Veterans receiving VA healthcare also reported higher proportions of social engagement related to health about tracking diet, weight, and exercise when compared to veterans not in VA healthcare system, although this was not found to be statistically significant.

Veterans in VA use the Internet for health information, and there is an opportunity to engage them more. Veterans as a population are integral to the sample of this study. Veterans performed better than non-veterans on the performance measure of everyday functioning and cognitive tasks (Thorpe et al., 2012) and that same research documents a strong correlation between post-deployment adjustment and financial well-being. Those returning from active duty have a higher degree of PTSD than those not in the military and repeated blast exposure and post-concussive symptoms seem to be a component of this (Cohen et al., 2009; Elbogen, Johnson, Wagner, Newton, & Beckham, 2012). New research is being performed on the emissions from contaminated burning wastes by the military in burn piles/pits that has occurred in both Afghanistan and Iraq (Woodall, Yamamoto, Gullett & Touati, 2012) and these environmental hazards have or in the future have been noted to affect both cardiac and respiratory function (Lepore et al., 2012). Nonetheless, it is evident that veterans as a group experience significant health issues. Use of SM may be a means of helping to address some of these issues in an expeditious manner. Moreover veterans experience long-term conditions that may be amenable to self-management.

MyHealtheVet PHR

Given the literature to date, one key resource available to veterans is the MyHealtheVet program (MHV). MHV is a web-based PHR that complements the existing traditional health care architecture to improve co-managed care and to encourage veterans and their families to play a more active role in their health care (Nazi, 2010). The original MHV program, begun in 2003, allowed for uploading of vital signs and included hyperlinks to Internet information pertinent to veterans, but at that time the program did not have links to email providers nor did it allow for either prescription refill, or access to the appointment management functionality or other links that are now present. Incremental additions were made to the program and by 2010 laboratory work was available to veterans, secure messaging was instituted to allow written communication between consumer and provider, and prescription refills and appointment management functionality were all available within the MHV program. By October of 2009, over 850,000 veterans had access to the My HealtheVet site, with the total number of visits exceeding 32 million (Nazi, 2010). As of 2010, 14.5 million prescriptions had been refilled using the My HealtheVet program (VHA, 2010). But little is known about how people actually traverse this or any PHR.

Currently, MyHealth*e*Vet is an example of a bidirectional personal health record. MyHealth*e*Vet (MHV) is an Internet portal that is available to veterans, their families and employees of the Veterans Health Administration. MyHealth*e*Vet is located online at http://myhealth.va.gov/. Like other Websites, this program may also be accessed from a veteran's home computer, but is also available at kiosks at VA medical centers and can be accessed at any computer with access to the Internet, such as within public libraries.

Compared to national statistics on general Internet use, veterans have distinct differences with the greatest users of the system. Veterans less than 40 years of age are low users of the MHV PHR. Those 41 to 50 years of age account for approximately 11% of users. Veterans 51 to 60 years account for 34% of users, while veterans 61 to 70 years of age are the largest group of users at 35%. Those greater than 71 years are 16% of the users of My Health*e*Vet program (Nazi, 2010).

The MyHealth*e*Vet Website provides access to approved health information, condition specific information and links to three online libraries, including Medline Plus. Information on mental health issues can be easily accessed and a section is devoted to viewing videos. The Web site has links to federal and VA benefits and resources, on-line prescription refill services and the veteran's personal health journal. The purpose of the personal health journal is for participants to manage and track personal health information (VHA, 2003).

The MyHealth*e*Vet system maintains health insurance information and treatment locations. The system pulls events from past military service into the patient's MHV record to track exposures experienced and previous assignments that may relate to a veteran's health history. It displays start and stop dates of medications, dosing information and prescription numbers as well as allergy information. Medical events, discharge summaries, and health reminders may be logged and the treatments prescribed may also be included in the personal health log. Medications from non-VA providers and over-the-counter medications are entered into the system by the veteran, to compile a complete listing of all medications being taken. Immunizations received, dates

administered and any reactions may be recorded. Readings from laboratory tests and vital

signs are tracked and the program allows graphing of the results.

Individuals may also enter their own personal health information into MHV. As

part of a bi-directional system, participants may enter medications from outside the VHA

system, but also are able to record other information. Fields are included for participants

to track vital sign measurements and some lab test results that the individual follows,

such as fingerstick glucose results.

Registration to access the HealtheVet program is free and requires the consumer

to input demographic information as well as an initial in-person authentication. Within

the privacy policy, the program stipulates that unauthorized disclosure of information

may result in criminal or civil penalties. Participants' email addresses are also required

for registration purposes and in the near future will be used as a tool for messaging. It is

reiterated that only authorized persons in the conduct of official business may use any of

the information. At the time of registration, users may request email updates of health

information, based on selections within areas of interest. The internet web site utilizes

several layers of security to protect personal identifiable information of registered users

and can identify unauthorized attempts to access the system, change information, or the

intent to cause other forms of damage to information or system security.

Inspection of information gleaned from surveys completed by veterans at initial

start-up to the MHV Website, (Office of Information, 2008) reveals the following

regarding users: 81% of MHV users are men, 68% are between the ages of 50 and 68

and served in the Vietnam War era. Although veterans live in all 50 states, the states

with the greatest number of veterans are California, Florida and Texas, with about one percent of veterans living outside the United States.

Use of MHV was assessed by the Veterans Health Administration's (VHA) Office of Health Information from October, 2007 to October, 2008. The American Customer Satisfaction Index (ACSI) Survey measured user satisfaction with the MHV and also identified user characteristics, preferences and needs for the program. Respondents to the ACSI questionnaire represented a random sample of site users (N=100,617), who had navigated at least four pages on the Website prior to being asked to complete the survey. Respondents predominantly (60%) served in the Vietnam War, followed by 19% who had peacetime service. The majority of respondents were between the ages of 51 and 70 (68%) while 16% were 71 years or older. Fifteen percent were between the ages of 31 and 50. Ninety one percent were men. For the subset of users who indicated they served during the Global War on Terror (N=5626) a greater percentage were women veterans (19%).

Nearly all (96%) accessed the MHV Website from their homes though 11% also accessed the site from their place of work. Three percent of respondents used computers situated at the VA to access the MHV Website. More than 90% of MHV users reported using high-speed internet access to connect to the Website while 7% continued with dial-up access. The majority of respondents (68%) to the ACSI survey rated their ability to use the Internet as "Advanced" or "Intermediate" (29%).

The greatest numbers of respondents (49%) to the survey accessed the MHV Website approximately once a month, but 25% stated they accessed the Website weekly. Two percent of those surveyed stated they accessed the site more than once a day.

Prescription refill was reported as the most requested service online and the top objective of the visit (75%), while pertinent to this study, is the fact that 13% of those who completed the survey stated they went to the site to record or track personal health information, such as blood pressure. However, their overall satisfaction with the Website was not assessed.

To summarize, the MyHealtheVet program is a PHR that has been in existence for more than 10 years. It was designed to improve patient care and to encourage patients and their families to become more involved in their healthcare. Over one million veterans and their families utilize the MHV program for a variety of reason and outcomes. Nearly half of veterans using the MHV program access the system monthly, with a quarter of users doing so weekly.

Self-management

Self-management is nearly a prerequisite to secure messaging; Emani et al. (2012) consider information self-management to be one of the primary functions of a PHR and messaging, thus secure messaging assists patients to connect as required, to their providers. The first to look specifically at self-management in the course of chronic disease was Lorig (1996). That model contains three distinguishing features: (1) dealing with the consequences of illness, (2) being concerned with the problem solving, decision making and confidence of the patient and (3) the partnership between patients and health professionals. The model clearly stated that self-management was to be "supported by medicine and public health" (p. 677.) The Lorig model differed from existing models of self-management in that its purpose was to assist patients in gaining skills and confidence to deal with their chronic disease.

Since the late 1990s, self-management has been examined in multiple populations and by multiple authors and theorists (Grey, Knafl, Lynn, Dixon & Schilling, 2011; Lorig, Holman, Sobel, & Laurent, 2006; McCorkle, Ercolano, Lazenby, Schulman-Green, Schilling, Wagner & Lorig, 2011; Mertig, 2011; Ryan & Sawin, 2009; Schilling, Dixon, Knafl, Lynn, 2009). Self-management emphasizes the individual's role in managing his or her illness, assisting with medical management, providing them with necessary knowledge, skills, and confidence to deal with disease-related problems and to collaborate with healthcare providers and the healthcare system (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001). These models all have remained true to Lorig's inclusion of three factors for self-management. In 2003, Bodenheimer listed two components of self-management education for patients with chronic disease: training in knowledge and technical skills related to their specific chronic condition and training in problem solving skills to assist in behavior change. The author stated self-management may be the most important component of the chronic care model.

Barlow and others (2002) have defined self-management as the individual's ability to manage the symptoms, treatment, physical and psychosocial consequences, and life style changes inherent in living with a chronic condition. These authors maintain that for self-management to be effective it needs to encompass the ability to monitor the condition and to affect responses necessary to maintain a satisfactory quality of life. Chodosh, et al. (2005) defined self-management as a systematic intervention targeted toward chronic disease.

In a commentary, Grey, Knafl, Ryan, and Sawin (2010), wrote that distinctions were made relative to approaches in self-management. In a commentary directed at the

authors of the specific theoretical framework (IFSMT) on which this current research is based, Grey and Knafl stated that Ryan and Sawin (2009) list the various perspectives available on the concept of self-management. At the conclusion of the commentary, all authors closed with the premise that different frameworks brought forth by the study of self-management are beneficial. The group concluded that all studies "contribute to the science of self-management and will ultimately lead to improvements to provide appropriate and effective care" (p. 3). Unknowingly, but perhaps in response to this, Shulman-Green et al. (2012) completed a metasynthesis of 101 self-management articles to detail the actual processes of self-management. Three categories of self-management processes were identified: focusing on needs due to the chronic illness, activating resources, and living with a chronic illness. Further tasks and skills were then listed as documented in the articles. Yet in this very recent article, not one of the skills included the use of computers, CHI, tracking in a PHR, or utilizing SM with providers.

The term self-management is used by investigators to convey the fact that people can successfully care for themselves. In this world of shortened hospital stays and increased comorbidities (Michaud, Goldman, Lakdawalla, Galley & Zheng, 2011) the concept of self-management becomes increasingly important. These reviews differ based on individual authors' attempts to finely tune the concept of self-management, but the overarching goal is similar: individuals need to understand their disease and how to live with it and with their providers. SM could be a crucial component of the self-management method in that communication is key to this process. How self-management is made operational by SM users will need further exploration as SM becomes more integrated into health care.

Chapter Summary

The foundation for use of specific variables under investigation for this study has been established in this chapter. Included in the review was the supporting structure of consumer health informatics, which is the footing for the study or the broadest point at which to begin. From there the review of literature funneled into personal health records that from a computerized view, support the premise of SM. The literature review then moved to the concept of self-management to augment the use of the ISMFT theory in this research; the review of self-management was completed and limited use of consumer health informatics within the concept of self-management was brought to the forefront.

To illustrate the range of experiences among veterans within this planned program of research within the VA, two basic veteran differentiators were examined. Women veterans' differences in health care needs, outcomes, and requirements were reviewed. Differences in age and use of the Internet were also evaluated for its impact on the technical aspects of SM. Finally, it has been determined by this review that no one has looked at patterns of use, as time or dates that people anywhere have used the Internet, and more specifically, no one has looked at patterns of use of SM.

Chapter Three

Methodology

The purpose of this study was to describe the themes discussed using SM, the pattern of use of SM, and whether the themes discussed and/or the pattern of use varied based on gender and age of the SM user. The use of SM in one specific healthcare organization is described in this study. A discussion of how and when patterns of use of SM varied based on gender and age of the SM user is explicated. A description of the design, setting, sample, data analysis, database, data collection, and analyses are provided in this chapter.

Design

This was a non-experimental, descriptive study (Polit & Beck, 2012). The purpose of descriptive studies is to observe, describe, and document aspects of a situation as it naturally occurs and that can serve as the starting point for hypothesis theory development (Polit & Beck, 2012). Grimes and Schultz (2002) said that descriptive studies often represent the "first scientific toe in the water in new areas of inquiry" (p. 145). Given the limited information available regarding SM, this design was the most appropriate to employ.

There is some degree of conflict as to whether content analysis, the form of analysis used in this review, is a quantitative design method or a qualitative one. Creswell (2011) considers content analysis a "mixed method" involving the collection of qualitative data and its transformation and analysis by quantitative means. Waltz, Strickland and Lenz (2010) write that in quantitative research, content analysis involves the systematic and objective reduction of recorded language, into a set of categories.

Where appropriate, chi-square calculations will be placed to enable comparisons of these

categories (Plichta & Kelvin, 2013). Krippendorff (2013) states that he relies heavily on

quantitative content analysis because "researchers working within this tradition have

tended to encourage greater explicitness and transparency than qualitative scholars" (p.

90), thus this study is approached from a quantitative content analysis perspective.

Setting

Secure messaging is a server-based approach to electronic communication that

protects information when sent outside of a home or an organization (Zhou, Garrido,

Chin, Wiesenthal, & Lang, 2007). A SM user accesses a web-based program and the

communication is restricted to those who have been given access to the program. Each

user is given special keys within the system, attached to their access codes, to send as

well as receive messages. Secure messages within the Veterans Administration's (VA),

MyHealth*e*Vet (MHV) program begin with a subject line, similar to how any other email

message is structured. Secure messages at a single hospital facility in the Midwest will

be reviewed.

This particular campus in the Midwest is the only healthcare facility specifically

created to care for veterans, active duty members, and the dependents of active duty

members. As such, it is referred to as a federal healthcare facility, but grew out of the

VA system. This unique hybrid is one facility within one of the VHA's twenty-three

Veterans Integrated Service Networks (VISN). VISN 12, the Great Lakes Healthcare

System, is comprised of a network of hospitals all connected to the local Central Office

of the Veterans Health Administration in Hines, IL. Comprising VISN 12 are the Edward

J. Hines Medical Center in Maywood, IL, Jesse Brown Medical Center in the city of

Chicago, and Clement J. Zablocki Medical Center in Milwaukee. VISN 12 also includes

the William S. Middleton Medical Center in Madison, WI, Tomah Veterans

Administration hospital, Oscar G. Johnson Medical Center in Iron Mountain, MI and

James A. Lovell Federal Health Care Center in North Chicago, IL. The number of secure

messages sent by patients and aspects of response from the healthcare team is measured

by each facility in the VISN and SM usage is also compared to other facilities in the

VISN and the country. This review took place at one of the healthcare facilities within

VISN 12.

Secure messaging has been in use at this hospital since July 2011. Users of SM

are instructed at the time that they sign on to the system, that it is not to be used for

conveyance of emergent information. Within the VA, providers are required to respond

to a secure message within 72 hours per the guidelines of the MHV program. Once the

time exceeds three federal business days without a response from a member of the

healthcare team, the message is considered "escalated", and is reported up the chain of

command. At the start of the study 43% of secure messages were answered within 4

hours and 58% were answered within 8 hours. The number of escalated messages

averaged 9% over a 13 month period. Messages have an excellent response rate overall:

99.78% of all patients' SM are completed by the healthcare team (S. Cech, personal

communication, April 17, 2013).

Sample

The sample for this study was derived by identifying PHRs that met the following

inclusion criteria: users must have (a) in-person authentication, (b) initiated a secure

message during the following randomly chosen months: July 2012, January 2013,

February 2013, April 2013, November 2013 and December of 2013. The months studied were arbitrarily drawn from a list of the previous 18 calendar months in which secure messages had been written. The convenience sample of secure messages in this study was drawn from data of veterans, or family members who had been given permission by the user to enter into the user's PHR in the Veterans Administration (VA) program, MyHealth*e*Vet program (MHV) at a VA in the Midwest. According to statistics for fiscal year 2013, there were 51,757 unique veterans, active duty members, and active duty dependents registered for care, resulting in a total 375,958 visits to this hospital in the Midwest (D. Meeker, personal communication, March 11, 2014).

At this center, 48.09% of the veterans had registered to use SM as of January 2013. Approximately 9.7% of the active duty members and their beneficiaries also registered to use SM. A total of 10,560 secure messages had been written since March 2012 (S. Cech, personal communication, April 17, 2013). The number of secure messages varies month to month but has increased over time from 23 in August of 2011 to more than 1600 in March of 2014. Message strings to be evaluated for this study included messages begun by the user/patient.

Throughout the local VHA network, approximately 28% of user messages are responded to by a provider. At this VA nearly 46% of messages are answered directly by the provider. A listing of messages and message strings is visible on a user's SM tab within the MHV program and thus become a permanent record of their communication. Providers may determine whether the patient's communication will be added to the VHA's EHR by checking a box within their SM system. Messages saved by the provider are added to the list of progress notes in the patient's EHR.

As a federal healthcare center, this hospital also cares for active duty members who are currently serving in the military. A majority of the active duty members served are members of the Navy. Active duty family members are considered dependents of the active duty personnel and may also receive their health care at this VA. Active duty members and their dependents may also be SM users. A family member or friend may enter secure messages on the behalf of, and with the permission of the veteran. Thus, several people other than a veteran may be an SM user.

Data Collection

Approval to begin this study was initiated within the VHA at the Institutional Review Board at Hines, IL (Appendix A). Approval was received from the VHA in December, 2013. Approval was also obtained from the University of Wisconsin, Milwaukee Institutional Review Board (Appendix B), which was received in January, 2014. Data collection began after both IRB approvals were obtained.

Data Preparation

A Microsoft® Excel workbook was designed with the following column headings: the number of the entry beginning with the earliest message in time as 1, date of each secure message entry, an arbitrary identification code, gender of patient and age of patient. The next column addressed whether the patient entered the secure message (a Yes/No answer), while the next column addressed the question of whether family authored the message (a Yes/No answer). Following that was a question of to whom the message was sent, and a column addressing whether corroboration of the note occurred with another, verifying the reliability of the data. There were three columns used to list the themes of each message as needed: theme 1, theme 2, theme 3. At a later date,

another column was added to the workbook: theme 4. The need to accommodate a fourth

theme was initially noted in message number 22. The final column of the spreadsheet

contained the actual wording of the message itself, referred to as the complete

concordance by Krippendorff (2013). An example of the Excel spreadsheet is seen in

Table 2, with a sample of patient information entered below the headings.

Table 2

Excel Spreadsheet Example of Record

Date	ID	Gen	Age	Pt Auth or	Fam Author	To	# in thread	Corr ob w/	Theme 1	Theme 2	Theme 3	Theme 4	Message
4/11/13	599	M	63	Y		MD	2	KM	Concern	Requests follow up			doc I have appointment with you next week and was…

Lists of all patients' messages written for the specific months were developed.

Again, the months reviewed were July 2012, January 2013, February 2013, April 2013,

November 2013 and December of 2013. The review of secure messages from these

specific months resulted in a total of 1200 messages for review.

The messages were read in the EHR. Reading from a list of secure messages for

the first month, July 2012, the first patient's EHR was opened. The message for the

specified date was accessed. The note was read and then reviewed and copied to the

computer's memory. As data could not be copied directly into the Excel spreadsheet, the

message was first pasted into Microsoft® Word. In Word, all names and identifiers of the

patient, family member, providers and clinician were removed. Any refill numbers for

prescription drugs were deleted. Phone numbers were deleted. All paragraph markers (¶)

were deleted so that the message would eventually fit within one cell in the Excel

workbook. The note was initially reviewed to ascertain the overall theme. That complete

message was then cut from Word and pasted into the Microsoft® Excel workbook. Some

messages were comprised of a simple phrase "refill lisinopril 40 tabs", where other

messages stretched for several paragraphs.

Data Analysis

Data were analyzed using quantitative content analysis in the design

(Krippendorff, 2013). Content analysis is a research technique for making replicable and

valid inferences from texts to the contexts of their use (Krippendorff). Content analysis

has been defined as the systematic, objective, quantitative analysis of message

characteristics (Nuendorf, 2002). As a research technique, content analysis provides new

insights, increases a researchers understanding of particular phenomena, or informs

practical actions. Content analysis "is a scientific tool" (Krippendorff, 2013 p. 24).

Content analysis pays meticulous attention to nuances and embedded meanings of every

word in a data corpus and is part of the analytic process which suits this type of study

approach (Miles, Huberman, & Saldana, 2014).

The process of content analysis involves several steps as detailed in the literature.

The number of steps varies from author to author, though the overall information they

communicate is similar: all authors have the goal of analysis concurrent with the

collection of data. Some researchers delineate eight or more steps in content analysis

(Waltz, Strickland & Lenz, 2010; Schreier, 2012), while others combine or remove some

of the steps (Miles, Huberman, & Saldana, 2014).

In this study the following content analysis steps as listed by Krippendorff (2013)

were followed: 1) unitize; define relevant units, 2) sampling, which allows the researcher

to limit observations to a manageable subset of units that are statically or conceptually representative of the set, 3) recording/coding; the reliance on the coding instructions, 4) reducing of data to manageable representations, allowing for efficient representation of large volumes of data, 5) abductive inferring, which bridges the gap between descriptive accounts of texts and the themes contained within, and 6) narrating the answers, thus making the results of the study comprehensible to others (Krippendorff, 2013). Each of these steps is addressed in research questions one, two, and three, which deal specifically with the use of content analysis.

Content analysis is sometimes done with multiple coders, who review files or texts for themes or topics. To ascertain the reliability of the work, one looks for stability, replicability, and accuracy of the coding (Krippendorff, 2013). If only one coder is used in a study, the stability, replicability, and accuracy can only be assessed as consistency across time (Schreier, 2012). For any documents in question, and periodically to assure stability, replicability, and accuracy, an additional comparison and review was completed by others. One person to assist with reliability was the dissertation chair. Two other nurses assisted with this validation process, each well versed in patient care and informatics and who will be referred to as validators. Polit and Beck (2012) equate reliability with stability, consistency and dependability. As Krippendorff's steps for content analysis were the designated method of analysis for this review, his prescribed steps were adhered to ensure both reliability and validity.

Initially a small number of messages were distributed to a validator. This nurse was told to read several messages and determine the themes contained within each patient's secure message. Once accomplished however it was found that several themes

were still noted as present in the message. Further analysis determined that the guidelines or instructions for coding secure messages required an additional, *second* review of each message. At this point the directions for how to code were revised for clarity The revised instructions requested the validator to read an individual message and code for obvious themes contained within the message; then to re-read the message and to re-code, specifically looking for additional themes which might be present. Instruction also included the caveat to contact the primary investigator with questions or comments or need for clarification (Appendix C).

Validators were given a number of messages in a separate Excel spreadsheet to review. Coding session were held to review larger numbers of messages for review to assure reliability of the information coded. Initial review achieved 96% reliability testing while coding with the validators. Later reviews of larger numbers of messages included 94% and 97% concurrence on themes identified.

Research Questions

Question One

What topics do patients, family members, or friends of the patient discuss when using SM?

Analysis. This question was answered by the primary investigator reviewing each one of the 1200 secure messages to determine the multiple themes contained within each message. Content analysis was used to answer Question One. Krippendorff's (2013) six steps of content analysis were employed and are described here. A validator and the dissertation chair assisted in reviewing codes to validate themes as discussed previously.

1. Unitize. The units to be reviewed were determined by each message. Each

message was a separate line item carried into the spreadsheet that captured the data. The

unit discussed in this section is defined as a secure message, thus one secure message

equaled one unit.

2. Sampling. This study was accomplished with a convenience sample. The

sample had to be large enough to assure an understanding of issues that were important to

SM users, but small enough to allow efficient analysis.   All secure messages written by

SM users during the months of July 2012, January 2013, February 2013, April 2013,

November 2013 and part of December of 2013 were reviewed. Krippendorff (2013)

states, "the units sampled are the units counted" (p. 113). Thus 1200 messages was the

number of the units.

3. Coding. Coding of these texts was accomplished by multiple or iterative

reviews of each of the secure messages, to establish a theme or themes (Saldana, 2013).

As messages were copied into MS Excel, they were read first for their tone. Each

message was then reread to refine the message down to the prevalent theme or themes

identified within it to discriminate exactly what the patient was writing about. The

overall theme of the message was identified and marked as Theme 1. If there were

additional themes these were marked as Theme 2 and Theme 3 initially. By message 22

an additional, fourth, theme was identified within a message and another column in Excel

was added to notate the information of Theme 4. There was nothing outstanding about

message 22 containing four themes; it contained less than 130 words. But the message

included information about a recent vaccine received, concern that time spent in Viet

Nam could be the source of the current positive result for skin test, requests for

medication refills and information reminders for an upcoming appointment. No messages were coded with a fifth theme.

As noted, reliability of theme identification was accomplished by the primary investigator. Yet, if at any time a message with questionable themes was noted, it was marked and given to one of the validators or the dissertation chair for further review and concurrence. In all, 1200 messages were read and coded. Within the 1200 messages, 1720 total themes were identified. These themes were eventually included in a coding dictionary (Krippendorff, 2013), (Appendix D).

4. Reduction. Reduction was the next step in the content analysis process, and allows for efficient representation of large volumes of data. Initially 1720 themes were transferred to a multiple sheets of paper which were then cut apart into individual themes. These were then hand sorted into like-groups on a table. However, it became difficult to handle that number of pieces of paper and track them all. Thus a different method of sorting was devised. All 1720 themes were placed into a new MS Word document. Placing them in Word allowed for themes to be moved, that is, "cut" from one area and dragged or "pasted" into another section with a loosely-descriptive phrase as the topic header. This way the themes could easily be moved about and not lost. This movement or shuffling of the themes allowed for ease of reading and categorization, assuring that themes were clustered into an initial categorization of 21 loosely-descriptive topics.

5. Abductive inferring. This step in the content analysis process is the conceptualization that Krippendorff says bridges the gap between descriptive accounts of texts and the answers to the analyst's questions. Krippendorff states "abductive inferences are supported by the evidence of the texts" (2013, p. 86). In this step, the

analyst reviews the relevant text, analyzes it, and then infers something from it. There is

some discussion as to whether abductive inference is the right of a researcher—should

the researcher simply echo back the results of what was found (Schreier, 2012). Yet, the

desired outcome is an analysis of what was said, not rote read-back. Thus to use

abductive inference is to analyze, reduce, and summarize what was said.

To clarify, Krippendorff (2013) suggests that the investigator begins with the

written text and then maps it to initially discern the topics being discussed. That is the

summarizing processes of unitizing, sampling, recording and reducing; all the steps of

content analysis taken to this point. The analytic construct in this step of the process

takes what the researcher "knows, suspects or assumes about the context of the text and

operationalizes that presumption in order to produce inferences from the text" (p. 170).

Analytic constructs are adopted to justify the abductive inferences that content

analysts make (Krippendorff, 2013). Analytic constructs are the background information

that the analyst brings along, based on what the analyst knows or suspects about the text.

Krippendorff cites four sources of certainty that allow a researcher to develop analytic

constructs: previous successes and failures of content analysis, established theories about

a context, embodied practices, and expert knowledge and experiences with a context. In

this research, expert knowledge and experiences were utilized by the researcher as the

certainty to develop the analytic constructs.

The process of abductive inferring required that   the initial group of 21 loosely-

descriptive topic headers mentioned earlier in the reduction step of this process be

reviewed analytically.   Review of the topics ensued, using expert knowledge and at times

discussion with the validators. Topics were combined and collapsed. For example,

topics having similarly-toned qualities, such as consult requests, or follow up on consult, or discussion with outside specialist, or hearing aid battery requests, or support stocking or request for a walker, were combined into a more comprehensive topic. Finally, these topics were abductively inferred to a generalized topic of "Consults". Thus the initial 21 topic-groupings were reduced and clustered, and reduced again using expert knowledge of the messages and themes. This resulted in a total of 15 topics. Those 15 topics were further reduced to 13 topics. Ultimately ten topic-descriptive names were used to label and represent all 1720 themes.

A discussion and review with the dissertation chair resulted in further analysis. Again topics were reviewed to best capture the overall topics being mentioned in SM. This final review resulted in a final analysis of the final ten topics that best described the patients' 1720 themes. Figure 1 is a depiction of the reduction of 1720 themes into many topics. Abduction inference winnows the topics further so that to what is being captured is contained within each topic overall.

Figure 1.

Abductive Inference Use to Depict Winnowing of Topics
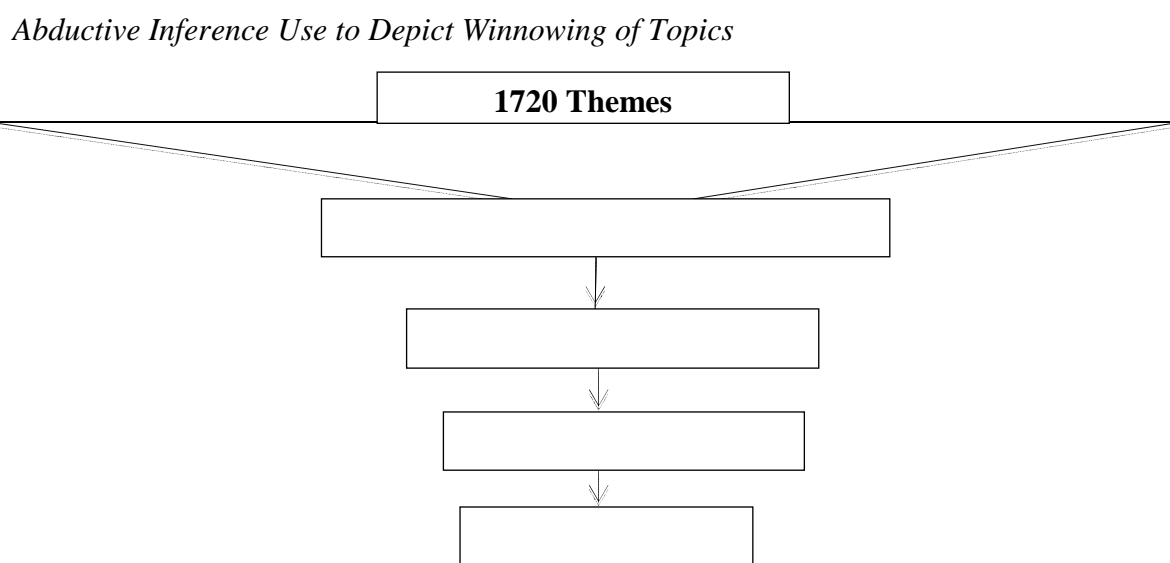
6. Narration. Narration is the final answer to the analysis, thus making the results of the study comprehensible to others (Krippendorff, 2013). The results of Question One were compiled. This information is presented in Chapter 4.

Question Two

Is there a relationship between SM topics and gender?

Analysis. This analysis was conducted using a combination of content analysis and descriptive statistics. This question was answered by sorting the original Excel spreadsheet by gender. Each one of the groupings, men and women, was then moved to separate worksheets within the Excel workbook. The total messages that were reviewed numbered 1200. Of that, 1040 secure messages or 86.6% were written by men or family members or significant others of these patients. Women writers of secure messages numbered 160 or 13.3% of all messages written.

Unitize. The units reviewed were the messages as identified by gender of the user. The time frame for inclusion into this cohort included all message strings written during the months of July 2012, January 2013, February 2013, April 2013, November 2013 and December of 2013.

Sampling, coding, *reduction, abductive inferring.* Determination of themes written by gender required further analysis. All themes were divided into entries made by men and entries made by women.   Each group of 1497 SM themes written by men and 262 SM themes written by women was then divided to determine which gender wrote what number of each type of the ten topics. Once this information was obtained, chi-square analysis was performed. These results were then calculated to determine the part of the whole for men versus women's entries.

Narration. The narration becomes the explanation of what was found in the review of SM by gender. Additionally, descriptive statistics were employed to report gender outcomes for topics uncovered within the secure messages (Plichta & Kelvin, 2013).

Question Three

Is there a relationship between SM topics and age?

Analysis. This analysis was done in part based on the content analysis completed for Question 1. The Excel workbook was copied and pasted in another tab based on the age column with reduction being accomplished by grouping users into 10 year age categories. Within the actual sample, the youngest participant was age 27. Thus the ranges were defined as beginning at age 25 inclusively through age 34, age 35 through age 44, and on. The youngest user of SM was age 27 and the oldest was age 92, as seen in Table 3.

Table 3

Age Range in 10-year increments

25-34 years
35-44 years
45-54 years
55-64 years
65-74 years
75-84 years
85-94 years

The data were sorted. Descriptive statistics were used to describe the users by age group. An example of the workbook is seen in Table 4.

Table 4.

Age sort example

Date	ID	Gender	Age	Theme 1	Theme 2	Theme 3	Theme 4	Text of Sec Mess
7/6/12	134	M	**40**	Response to provider message	Report on visit to ED	Appreciation		You're Priceless! You are always on top of my health care…
11/1/13	1022	M	**41**	Wants f/u on labs done				I got the EEG and a MRI and I was…

Unitize. The units reviewed were the themes found by age of the user during the months as previously listed.

Sampling, coding, r*eduction, abductive inferring.* Using steps accomplished in Question One, the data were sorted based on age to determine themes by age range.

Narration. In this question the narration became the explanation of what was found in the review of SM by age. Additionally, descriptive statistics were employed to report mode, median and mean ages of use for each SM general theme, along with the standard deviation of the mean (Plichta & Kelvin, 2013).

Question Four

What is the pattern of use of SM?

Analysis. In Questions Four, Five and Six, the data analysis method as well as the sample changed. Pattern of use was reviewed in a subset of the original sample of 1200 messages. As noted in the definitions section of Chapter 1, pattern of use was operationalized as the frequency or occurrence of use of SM by the SM User. This may

have included a monthly habit or frequency of using SM, or the repeated behavior of use of SM every Monday morning, or during the early hours of the day.

To demonstrate pattern of use in this study, a subset of 600 of the original messages was created. This was done by taking the total number of 1200 messages in the sample and placing them in sequential order from earliest written messages to most recently written message. The original group of 1200 messages was divided into three segments: the first 150 secure messages, the middle group of 250 messages and the final 200 messages, and were designated as the messages to be studied. Designating some of the earliest written messages, choosing the most recently written messages as well as those directly in the middle of the sample was felt to embody an arbitrary subset, representative of all secure messages in this study.

A new MS Excel worksheet was developed. Each individual note in the subset of 600 messages was reviewed for gender and age of the users, the day of week and time of day of the secure message. The results are discussed in Chapter 4.

Question Five

Is there a relationship between SM pattern of use and gender of use?

Analysis. The subset first analyzed in Question Four was reviewed for this question analyzing pattern of use by gender of the patient.

Question Six

Is there a relationship between SM pattern of use and age of the user?

Analysis. This question was analyzed in a similar manner as Question Five: the subset was examined for pattern of use based on age of the user.

Human Subjects/Institutional Review Board

Because all records reviewed were assigned a random number to identify each message, and no significant risked were posed to humans by the study, expedited reviews were requested. Institutional Review Board (IRB) approval was obtained from the Hines/FHCC IRB (Appendix A). Approval from the Institutional Review Board at the University of Wisconsin, Milwaukee was then also obtained (Appendix B).

Participants in this study were not identified. The de-identified information was recorded in both MS Word and MS Excel database by the researcher. Each of these 1200 veteran records was assigned an identification number. No identifying data was listed but the SM user's age and gender was included along with each data record. All clinician names, prescription refill numbers, phone numbers, addresses, and names of all manner of friends and family were deleted from each record.

Summary of Methods

This study used the methodology of Content Analysis to identify themes in secure messaging by users at this Midwestern hospital system. The research identified the topics written about by users. The process of content analysis using the six steps as outlined by Krippendorff (2013) was used to lend structure to the process, and these steps were examined and discussed.

This is a non-experimental, descriptive study as outlined by Polit and Beck (2012). Within this chapter, the description of the planned review was documented. An introduction to the method of content analysis as described by Krippendorff (2013) was described to explicate the use of this method in relation to the first three research questions. Questions Four, Five, and Six utilize descriptive statistics as reviewed.

Individual research question approaches vary slightly in their execution utilizing the best information to provide a clear outcome. The research questions were individually reviewed and the steps planned for eliciting best outcomes for the questions was discussed.

Chapter Four

Results

The purpose of this study was to describe the themes discussed using SM, the

pattern of use of SM, and whether the themes discussed and/or the pattern of use varied

based on gender and age of the SM user. The purpose of this chapter is to present the

findings of this investigation as they relate to the six research questions.

Description of Sample

All secure messages written at a health facility in the Midwest during the

following months were reviewed; July, 2012, January, 2013, February, 2013, April, 2013,

November 2013, and December 2013. The months sampled resulted in 1200 messages

for review. The total age range of the group, the mean, median and mode of the group

and breakdown by gender are presented in Table 5.

Table 5

Age range (in years), Mean, Median, Mode for Age and Gender

	Total *n*	Age Range Years (%)	Mean Age (years)	*SD*	Median Age (years)	Mode Age (years)	# Messages by another
Total	1200	27 – 92 (100%)	60.97	12.88	63	66	77
Men	1041	28 - 92(86.6%)	62.27	12.89	64	66	77
Women	159	27 - 75 (13.3%)	53.02	10.39	54	55	0

Of the total messages, 86.66% were written by men, or the family or significant

other of the men. The remaining 13.33% of the messages were written by women.

Hospital statistics demonstrate that currently at this facility 36% of the veteran population

is made up of women (D. Meeker, personal communication, March 11, 2014). There

were no family members writing on behalf of the women.

Of those men with surrogates writing messages (*n*=77), 41 (51.8%) of the 77 messages were written by the patient's wife. Twenty-five messages were written by the patients' daughters, 12 were written by the patients' sons, and one was written by a girlfriend. In all, 6.58% of all messages were written by a surrogate.

Within the SM program, on both the patient and provider side, there is an ability to attach messages together, referred to as a SM Thread. Of the 1200 messages, a total of 65, or 5%, were threaded messages. The majority of the SM threads had only two messages (52/1200) within the thread. But six secure messages had 3 messages in the thread and seven messages had 4 messages in the thread.

No more than four themes were identified in any message. Review of the 1200 messages resulted in a total of 1720 themes. A total of 388 messages had a second theme while 104 secure messages included a third theme. Only 36 messages contained four themes. After gathering the baseline data, messages were analyzed using Krippendorff's method of content analysis (2013).

Research Questions

Question One

What topics do patients, family members, or friends of the patient discuss when using SM?

As mentioned, the total number of 1720 themes was sorted using abductive inferring. This resulted in the definition of ten specific topic names whose overall title best expressed the themes contained within. These topics reflect the purpose of abductive inference as a step within content analysis, to summarize or simplify data to produce an

organized representation of what was said. The ranked list of the final ten topics and examples of some of the 1720 themes are shown to note the association of topic and theme, in Table 6.

The topic titled Medications contained the themes of nearly 35% of all messages written. The next most frequent topic was titled Symptoms or Change in Condition, which was construed to be a reference to self-management. The third most frequently used topic was Questions, Comments or Information to the Provider.

Table 6

Ranking (Frequency %) of Topics and Examples of Associated Themes

Rank	Total # Responses (%)	Topic	Themes contained within Topic
1	594 (34.5%)	Medications	Refill Rx statin/Hasn't received Rx in mail
2	261 (15.1%)	Symptoms/Changes in Condition	Symptoms, new/Update on condition: worse
3	242 (14.0%)	Questions/Comments or Info to Provider	Happy holidays/Report of fire at home
4	130 (7.6%)	Appointments	Squeeze in appointment soon/ Request for labwork to be drawn
5	109 (6.3%)	Consult Requests	Consult request: podiatry/Needs batteries for hearing aid
6	97 (5.6%)	Need Results of Test/Procedure	Anxious for test results/Requests labwork
7	92 (5.3%)	Reports of Outside Appointment/ Outside Hospitalizations/ ED Visits	Report on emergency visit/ Update on consultant visit – outside system
8	68 (3.9%)	Blood Glucose/Blood Pressure/ Vital Signs	Blood glucose results/Report of blood pressure results
9	66 (3.8%)	Complaints/Concerns or Problems with VA	Anger with staff member/ Concern that diabetic rx led to cancer
10	61 (3.5%)	Replies to Provider Message	Drinking less/Emoticon

A subset of this information included the themes generated solely by caregivers. There were 77 messages that were written by family members or friends of patients. Those 77 messages resulted in 117 themes (6.8%) of the total 1720 themes overall. The

percentage of themes written by family or friends of the veteran was similar in composition to themes written directly by patients. An example is that within the total group nearly 35% of themes were related to medications, while in the subset where caregivers wrote messages, 31.4% of themes were medication-related. A smaller number of themes were related to appointments in the caregiver group (4.2% in caregivers vs. 7.6% in total group), yet monitoring of blood glucose results or vital signs at (4.9% in caregivers vs. 3.9% in total group) was similar. There were a greater number of reports of outside appointments in this group of caregivers (7.4% vs. 5.3% in total group) and more symptoms—21.4% in the caregiver group versus 15.1% in the overall group. Yet the number of comments and questions to providers was nearly identical in both groups at approximately 14% of all themes written.

When themes could fit into either one topic or another, placement of the theme was guided by the role of Analytical Constructs as delineated by Krippendorff (2013), which calls on the use of "best judgment, frequently in collaboration with another person to assure reliability". An example of this was found in a theme listed as "Concern over starting husband on too high a dose of thyroid medication". That message could be construed initially as belonging under the topic of medication. Following the guidelines, the investigator reviewed the actual message as written by the patient's wife. The whole message seemed to demonstrate concern over beginning the dosage of thyroid medication at a higher dose than the wife felt was required, based on her *own* past medical history. In this instance a nurse validator also reviewed the message to assure the accuracy of the coding. The decision was made to sort this message into the topic of Complaints/Concerns rather than within the topic of Medications, as displayed here:

> I received your medical record form for my husband. The last test he had
> showed his level of thyroid was low. Where is his level? You want him to start
> synthroid pill .0125. I think he is starting with to much supplement. I have been
> taking sythroid for about 60 years, I think .075 should be a starting point. and
> than work up as needed. Mrs. X As you know he does have heart problems

The information that follows is the result of compiling several steps taken from

Krippendorff: reduction, narration, and abductive inferring. Each of the ten topics will

be reviewed for the purpose of demonstrating the types of messages included within a

topic. Selected quotes appear under each topic as exemplars of messages reviewed.

Some of the following quotes are also examples of messages containing multiple themes

within a single message. The goal of all this is to assist in clarifying why messages or

parts of messages, in the case of multiple themes contained within a single message, were

grouped under the specific topic. Topics have been cited based on frequency of use.

Medications. This topic contained the greatest number of the themes elicited

from SM. Of the total 1720 message themes, 594 or 34.5% of themes dealt with

medications. Besides requests for refills and new medications, some patients were alert

to the medications they take and asked questions about their medications and dosing, as

demonstrated in this message:

```
Dear J Did you change my Carvedilol to 12.5 mg 2X day? I just order a
refill. If it's  my original prescription it may not be filled for a
month. I do not have  sufficient pills left for another month. I may only
have another weeks worth  left. Can you see if you changed my prescription
level, that will have them  generate a refill.   Thanks.
```

Others questioned the need for specific medications as was noted in the following

message:

```
After reading "The Great Cholesterol Myth" and talking to several  health
professionals out here in California, I strongly believe that I would be
best served to AT LEAST TRy stopping Statin useage for at least 3 months.
I'd  like your OK for this.  If you aren't comfortable with that, I would
request a  strong, clearly stated case for continuing useage.  I should
note that I am now  more serious than ever about reducing my sugar intake
and the ingestion of  other known unhealthy foods.  I want to live
healthy!  I truly am convinced  that the rosuvastatin has more liabilities
than any benefit from reduction in  cholesterol (which I intend to watch
closely thru diet and exercise)   Secondarily, would you please schedule a
```

visit with an urologist for late April? I am returning to Illinois on
April 16th. Thanks, for your assistance!

There were many requests for refills of narcotics. The hospital only allows

prescriptions for narcotics to be written for 30 days. But several of the lengthy messages

about medications, this one of nearly 450 words, were for more, earlier, stronger, higher

dosages, and refills.

> Good morning, I know you probably think this is early to request a refill of
> my medication but I need them refilled so they reach me this week. The
> last 3-4 months I have been running out of my meds early. I need my
> dosage increased or my number of pills increased. I need to take at 7-8
> pills of the 5mg. Oxycodone a day and this causes me to run out. so I
> need that increased one of those two ways. The other way we could do
> this is to switch me over to Tramadol. I went to see another Doctor and
> he gave me some Tramadol to try because I was out of my other
> medicine. It seemed to work pretty well and besides I was told it was not
> a narcotic. I had to take 4 50mg. tabs to get out of pain but it did work.   I
> am interested in switching over to this Tramadol, but it would take about
> 210 50mg. tabs per month. Or 60 100mg. tabs per month. I would really
> like to try this, especially if I could take this and get out of pain the same
> as with the morphine and oxycodone. I really want to find a way to get
> off of these narcotics. Unfortunately, I know I will have to take something
> probably the rest of my life, but if I can take something like tramadol and
> not have to worry about all of the physical side effects that come with the
> narcotics then I am very very interested in doing that. If I could switch
> over to tramadol and get enough to were I do not have to take any
> Morphine or Oxycodone or Carisoprodol ro Gabapentin then I am all for
> it. Either way I am going to need more medication with regard to
> immediate release pain reliever. I really want to stop taking the narcotics
> and try the Tramadol because it worked well the last couple of days. I
> will be out of that today as well though so I need something as soon as
> you can send it. Additionally, I need enough to last me every month. So
> if we can try the Tramadol please send at least 60 100mg. tabs or 210
> 50mg. tabs. then you dont need to send me the Oxycodone. If I stay on
> the Oxycodone I will need at least 210 5mg. tabs or at least 60 10mg
> tabs or higher because what I have is just simply running out every
> month now. Please advise and we will move forward from there Thank
> You!! As usual thank you for your attention to this matter.   Respectfully,

All VA patients receiving narcotics from a VA provider have signed an agreement

to not request or take narcotics or other pain medications from providers at other

facilities. Another example of a request for stronger medication includes the following

message.

```
I seen a doctor on monday who was covering for doctor
B for my shoulder  pain and she prescribed me tramedal
and told me if it doesn't work to let her  know. It
doesn't work and I need something stronger such as
percaset
```

There are notable differences in the length of messages patients write about their medications. Length of requests varied. Some were very short, as this request of four words, is seen in the messages: "My Pain medicine 10/325" and another consisting of seven words is seen in: "ty, it's time to refill the morphine". This complicated message contains nearly 150 words, and mentions four other providers, changing dosages and multiple symptoms:

```
Hi R,  I was in to see my Neurologist this week. He recommended changing
my Gabapentin  to 2 tablets 3 times a day. I also was in to see my
internist who agreed with  this. They seem to think it will help my pain.
I also saw my orthepedic surgeon  who convinced me that I should take the
pain medications on a regular basis. He  said 1 to 2 every 6 hours. It
seems to have helped but sometimes my stomach  gets upset. I only took 2
one time and I slept really well that night. Also My  internist sent a
message to Dr S regarding aqua therapy. I saw that she  sent me a message
but had already clicked to send ou the message first. If  possible would
you change the Gabepentin prescription and make it a 3 month  supply
instead of 1 month that it is now
```

There were requests for having the VA fill prescriptions from outside providers (outside the VA system) which has never been allowed. For example, "Good Morning, Received a prescription from my dentist, Z.   Rx: Chlorhexidene Gluconate .12%, one 16 oz. Bottle, to be used twice daily.   Can I request a VA Rx Refill or pick this up at the VA pharmacy? Thank you". Some requests for refills were short "refill omeprazole 20mg ec cap". Yet others as noted in several examples above were lengthy and round-about methods for procurement.

Symptoms/change in condition. This section accounts for 261 or 15.1% of all themes. Less than ten percent of all themes or messages related to symptoms were positive in tone, with the majority of messages noting new or worsening symptoms and reports of pain, discomfort, or illness.

My sinus congestion and face pain continued through October. I flew to
California in late October and the congestion was very painful. Dr. G
gave me a week of antibiotics. It gave some relief but congestion
returned after the week. He referred me to an ear, nose throat Dr. She
examined me, and put a scope down through my eustation tube. I had no
tumor or polyp. She subscribed astelin.   Not much help. I returned to
Dr. G. My ribs were aching (probably from violent, relentless coughing).
He sent me to get a chest xray. Results were negative. Then I went to see
Dr. K, an allergist. He looked at my medications and picked out 2
potential problems: carvedilol and flo max. I stopped the flo max and
now, a week later, I am 10% improved.

The following message contained confusing symptoms within the information,

which could have made it difficult to discern the intent of the message. This message

spoke to perhaps an improvement in a condition as a theme of the message, even if the

improvement was the result of medication:

You put me on Gabapentin/neurontin earlier this year for the nerve pain I
was experiencing. Since I have been on this medication, I have had no
reoccurences of the nerve pain. If you want me to remain on this
medication, I need a new refill. I also found that I only need to take
it once a day, not 3 times as the original prescription was written.
Can you have it just mailed to me?   As far as my recent bout of the
intestinal flu, I am feeling slightly better each of the last few days.
The vomiting and diareha has stopped but I am still weak with very little
energy. Hopefuly, I will be fully recovered by tomorrow.

Another message with themes of symptoms and medications is displayed here:

i have heard now from X. i feel a little better. pls refill vicodin. i
update u on pain for a lot of reasons including need for refill. i am
dead sure i need a fusion in the long run. this is a fact

Other messages were comprehensive, even when expressing a theme related to

some concern about symptoms.

I've noticed my heart rate 'high' and irregular since I've started down
the path with prostrate [*sic*] cancer. Since my CAT Scan, MRI's and Bone
Scan I've noticed these symptoms to continue and actually get worse. I am
thinking it may be the stress I am experiencing. I haven't taken my BP
med's yet this morning because upon checking my BP and heart rate they
came out to be 101/71 HR of 89. Last night @ 8:34PM BP= 98/77 HR = 59.
Just prior to this one @ 8:05 my BP was 143/95 HR = 163. I had taken my BP
med's yesterday as I usually do. so I don't know what to think of it other
than I feel fatiqued and at times I can feel my heart racing. All my tests
with the exception of my prostrate biopsy came back negative. I believe I
am going to go the route of 'Radiation' treatments for my cancer, but I
would like to feel better going into these treatments. I believe it is
mainly stress related perhaps triggering my WPW. If you wish for me to
make an appointment I will be happy to. Thank you,

Another note of respectful concern over symptoms was written by the wife of a

patient, displaying the caregiver's perspective, reads:

I will do that...maybe this afternoon...I will also send a note with my observations...I hate to do it in front of him because his loss of independence is eating at him and I dont want to make him feel any worse about it....he truly is trying to do things and just cant.

The majority of messages were less positive and some were highly detailed:

Dr., this is my record and symptoms of this issue and waiting for next step. Dr. E,. 10.10.13 Injury to left temple. Branch from shrub hit the temple. 10.11.13 Friday 2 pm. Activity behind left eye like a rushing through nerves or   blood vessels. Calmed down by 6 pm. Discomfort around left eye. Increased at night. 10.16.13 5 to 6 am. Head ache in upper left quarter of head. Used reflexology to ease pain. 10.17.17 headache in area around left eye was 4 or 5. took an aspirin at 2 pm.   relieved pain until 6:30. pain is not noticed in daytime as at night. Some days there was no pain.   10.18.13. Annual Physcial with Dr. E Mentioned injury.   identify any issues. Lab tests didnt indicate anything. 10.21.13. You mentioned that lab tests didn;t indicate any issues and that I was to check with ophthalmologist about condition of left eye. 10.25.13. Dr. W, Opthalmologist, examined eye and determined there were no issues of any injury. 10.27.13 late in day pain moved from area around left eye to area around right eye. Pain increased to 5 or 6 level. Took aspirin. 10.28.13 Reported to you by secure messaging, the report of the condition of the eye. You suggested a ct scan. Your response was to take Tylenol 650 mg every 4 to 6 hours for pain. 10.28. 13. Worked outside with cleaning up garden plants and flowers for 4.5 hours without any discomfort for muscles.   at 3 am, the pain around my head by the right eye increased to 5 or 6. Took 2 tylenol 325 mg. 10.29.13. 1am took tylenol. Pain continued. Used Tai Chi for 45 minutes and was able to get back to sleep. At 5 am Pain was still at 5 or 6.Took 2 tylenol again 10.30.13 ct scan at VA clinic. Nurse L reported that there was no indication of issues to the skull or head. There was no bleeding or sign of ruptured blood vessel. Scan showed normal aging. Nurse L recommended going back to eye doctor to have the eye examined for possible pressure on the optic nerve as a possibility as the cause of pain.   at 9 m, took 2 tylenol 325. rested until 2 am pain increased to 4 or 5 so I took tylenol. The Tylenol didn;t reduce the pain.   PAIN HAS BEEN TOLERABLE IN DAY TIME SO HAVENT TAKEN MEDICATION. ct scan was good but the pain continues. What is next, sinus or digestive issues?? had diarrhea, on 10.30 at 6 pm. Just one instance.   Pain during the night included area on top of my head and back down to my neck in addition to pain on brow and eye brow on right side of head. Does this tell anything? Discomfort shows up in digestive area. Tylenol doesn&#65533;t do any thing for the pain in the back of my head. 11.01.13 Dr. Warren, competent ophthalmologist, examined both eyes, checked the pressure. There were no issues or indication of anything. Dr. W checked my right eye on Oct. 25 and determined there were no issues. The pain is strongest, about 5 or 6 in my brow and eyebrow on the right side of my head. In daytime the pain is tolerable. At night is when it is strongest. Last night I took an aspirin rather than Tylenol. It seemed to be more effective. I have learned to take the medication before the pain begins and not wait for the pain to develop. 11.02.13 took Tylenol at 6:30 pm for pain in right brow area. 11 pm took aspirin 325mg for pain on top and back of head. 11.03.13 pain has moved from right brow area to top and back of head. Didn't take any pain reliever for the 24 hours of this day. 11.04.13 12:30am pain was at level 3 on top and back of head. Took aspirin 325 mg which reduced the pain to level 1. I have been taking less pain reliever since the pain has moved to the top of my head. [This is after the pain moved from left brow area to right brow area on Oct. 27]   I have taken a supplement for sinus issues. On Nov. 1, 2, and 3, I took 6 capsules of OregaMax [oil of oregano]. The oil of oregano is P73 wild oregano which federal government approved as a food item. The drops of Oil of oregano under my tongue, relieved the head pain almost as well as pain reliever. Are there other steps to be taken before the neurology consult? Where do I go for the neurology consult? Is it out of your facility? Then travel becomes an issue. Please advise me what to do. I would like to exhaust other possibilities if there are any. What is the next step? Thanks

Another reads:

```
I had a Angio gram on Jan. 30.  The results are that I definitely have one
artery that is 100% blocked.  It is the same one that was found the last
time I  had an Angio gram, in M, and they decided to leave it as my heart
had  formed new arteries.  At H they tried to open it and were not able
to, so  they are considering having me back to go in on both side,as the
surgeon feels  he has an 80% chance of getting a stint in.  My follow up
appointment is on  Feb. 13 and I will get more info then.
```

And the following message had multiple themes: increasing symptoms of pain,
difficulties dealing with life, and a theme for need for immediate medication refills. The
"bold" typeface is a reflection of the patient's entry.

So sorry to bother you but I am to the point where I need to ask you for
another refill on the Hydrocodone. I have been taking just the tramadol
for 6-7 months now, and it just seems to not be working so well anymore.
I know you sent me a refill of the Hydrocodone last month, but I had to
take all of that already. I have been having **more severe pain**,
discomfort on my whole left side and really the inability to do much of
anything. I am not sure if it is the weather or just the fact that I
have to raise my children by myself and there is more and more to do for
them, but I just **cant hardly do anything or even move** unless I have some
stronger medication. I think I am going to need to go back on the
Hydrocodone every month again like before. I hope that if I can just do
the 240 tramadol and the 60 hydrocodone every month now, then I could
supplement those two and **manage some sort of life**. Unfortunately, though
just the tramadol is not enough anymore. So if you could **please please
help and write me a script for Hydrocodone immediately**, I can come and
pick it up today. I am totally out and **I am dying today. This would
really really help me today**. I can come right over and get the script
from you and walk it over to pharmacy and pick it up today. It has been
a month since my last script for this and I am sure it could be filled.
I am so sorry to ask and **I try to go without some times**. However, **I am
in really really bad sorts and in miserable pain**. I know you said the
tramadol is on the way and I talked to Pharmacy and they said it is
coming so I will have to wait on that. Honestly though I need the
stronger Hydro anyway. They said to get with you and have you write a new
script for the Hydrocodone, then they could refill it now. So J **please
please get back to be ASAP** and **let me come over to pick up a script** for 60
Hydro and then **we should make sure I can get the tramadol and the
hydrocodone filled every month now. Please help**! Thank You for your
immediate attention to this matter, it is greatly appreciated. Sincerely
and Respectfully,

Comments/ questions or Information to the provider.   These messages account

for 242 (14%) of all the 1720 themes. Several (1.4%) messages thanked the provider for

their help. Quite a few were wishes for various happy holidays, depending on the time of

year. Conversely, some messages included threats to other providers:

```
I just found out I need biopsy of esophagus.  Dr. G ignored this, so if I
have  cancer, she is in serious trouble.  Dr. S is going to talk to her
about  some things, esp. now.  When is my mammo?  It's due this month.  It
is not  sched. bec. Dr. W did not see it.  Still LBP but a little better,
no thanks  to Dr. G.
```

And other patients wrote of having done something wrong and the tone was perhaps contrite or apologetic.

```
J, I am so sorry I was not aware that I was under some contract to not see
any one  else or take any other medicine.  I do not have any record of a
specific visit  or a full prescription.  I was just givin it to try as a
favor and there were  no formal scripts or documentation.  I am sure you
will be upset about that as  well.  However,there is nothing to send you
or document this.  I was just given  a couple of doses as a favor and as I
said there was no formal appointment or  prescription.  I am sure this
will upset you and I am so very sorry, but I was  not aware that I
violated any agreement or contract.  If I was aware of this I  would not
have even asked.  Additionally, If I can not get enough to help me I
would prefer to stay on the same regimine.  Please forgive me and see your
way  clear to continue to issue my meds as in the past.  I promise I will
not do  this again and I am now very aware of what I can and can not do.
Thank You!
```

Or similarly, though with a great deal of anguish:

```
DR. M I HAD NO IDEA YOU WOULD RECEIVE THIS I AM JUST FRUSTRATED SWEARING
DOESN'T GET ME ANYWHERE EXCEPT HAVING TO APOLOGIZE  OVER AN OVER !...
DR.M   I RESPECT YOU OUT OF EVERYONE THERE I AM SO SORRY TO SWEAR !  BUT
I'M JUST ANGRY I CUT TIES TO THE ONLY PERSON IN MY LIFE MY DAUGHTER !
```

Some of the messages do include the word thanks: "Thanks for ordering the EMG" and

```
Good morning,,I bet you miss me,I just have a question for you,in April in
will  turn 65,If i new I would live this  long I would have taken better
care of  myself,,anyway say I have a problem at home and use 911 to take
me to the  hosptial,,Do I pay for the 911 call and the stay in the
hospital,,   Thanks
```

Very few messages contained appreciation for care the patient received. That was found in this particular message: "Thank you for all your good care". Some patients share information with their provider such as "We've had a large fire" or "I had to quit school" and "Hi R, Can you please ask Dr B to get on secure messaging it does not work if they are not on it". Other messages include the need for assistance at home, gym access, handicapped car stickers and other needs.

Appointments. Some of the themes comprising the topic of Appointments may be examples of patients seeking help within a large and at times, cumbersome, hospital system. Themes about appointments accounted for approximately 130 (7.6%) of the total

themes. There were seven themed requests to "squeeze in their appointment soon".

Many themes asked the provider to make an appointment for them, for that particular

clinic or other clinics, such as this message:

> Good Afternoon, I am due for my annual PAP Smear, please let me know
> what dates you have in Jan to schedule an appt. Also, I will need
> another consultation with the dermatologist to schedule my next Botox
> procedure for my hyperhidrosis.   Thank you,

Other messages were notices of appointments occurring shortly or because of an

emergency, such as this:

> Well, I had a bad fall today at work or should I say yesterday and
> I was in enough pain to admit myself to the ER. My knee gave
> out/buckled and I fell straight down about four steps high. I
> twisted my back pretty bad and injured my knee. I was given 2
> days off of work and 15 Vicodin. I've already taken 3 of those and
> I still can't sleep. I'm hurting and need to get seen. There's no
> way I can go back and work 10+ hour days on my feet walking up
> and down hills and stairs. If you can please squeeze me in to see
> the doctor either today or tomorrow and able to give me more
> time off until I'm able to be on my feet for hours on end. It being a
> work injury, I need to make sure I'm good to go! Especially since I
> just started. Well, thank you for reading my long story! Lol..
> Please call me if I can come in. I'll be up at 730 to call in and
> report to my supervisor and give her an update on what's going
> on. I'll probably go back to sleep for a few hours and go in to fill
> out paper work. Thank you for your time! Happy New year!!!

Messages included requests to have lab work ordered on a specific day and

requests for certain lab tests. Some users wrote of questions they planned to ask at their

next appointment, such as how to find long term care facilities. Other themes listed

reasons why the patient did not attend a scheduled appointment.   A small number were

similar to this message: "sorry, I over slept and missed my Podiatry appt. Not worth the

drive to have you look at my neck" and this message:

> I'm so sorry I missed my appointment last week. I was taking my mother
> to the University of C hospital and completely forgot with everything

going on. I've rescheduled for 5 December, but I'm not 100% sure I can make"

And finally this message: "I had a appointment on 12/10 I called and cancelled".

Consults. Requests for consultative services with specialists, called "consults" in the VA, numbered 109 (6.3%) of total themes in this sample. Consults, as a topic, is comprised of requests for specialists and agreements to see a specialist, along with requests specifically made for durable medical equipment (DME: walkers, thromboembolic hose, hearing aid batteries and similar equipment), which is a specific consult service, Prosthetics, in the VA. The most numerous requests for consultations were to dermatology, orthopaedics, and podiatry. "can you setn up an appointment to see a VA foot specialist? I already ordered my shoes from my outside foot Dr... Thank you" and "Yes still have shortness if breath whenn I do alot of mopving around. not as bad as it was. I still get tired. I am still   requesting a cardiologist from the V.A.... appointment. Thankyou."

Requests for prosthetics consults and problems with DME accounted for about a quarter of the themes listed under this topic of consults. "Dr. D, can you order me a knee brace for support for both knees and some black support sock. Thanks" and "I went to prostetics to acquire the nasal prongs. they said that my primary had to put in an order before they would order the item", "Doc. E i've been having problems sleeping and when i wakeup i have thgis pain in my neck. i would like to have one of those pillow that they have with prosthetics".

Need for results of tests or procedures. Themes related to requests for the results of various tests and procedures that had been ordered and completed for the patient accounted for 97 (5.6%) of the total number of themes. Several of these were tinged with

some degree of concern, such as this message: "I am wonderin [*sic*] why no one is giving

me any information on what is going to happen with my left eye? No follow-up?".

Patients did seem to be in need of follow-up regarding testing, as seen in the two

following examples: "I am still looking for test results for VA Chemistry/Hematology.

How long does this normally take to complete" and

> Hi D Can you let me know what my blood test results are? I went in on
> Feb 21st. You should have them, hopefully by now. I would like to know
> mainly the A1C because it will determine if I go to the outside doctor or
> go to one at the VA.   Thanks, my phone number is xxxx

Reporting of outside appointments/outside hospitalizations/emergency visits.

There were approximately 92 (5.3%) themes that discussed treatments by other "outside",

VA and non-VA providers and admissions to other hospitals. Some of the messages

were about treatments and procedures from another VA such as:

```
J, I went to Milwaukee today and Dr. S said the
blood flow challenge  should correct itself in
approximately 3 months. Another vein or veins
will  expand to handle the blood flow back to the
heart. He ruled out moving the  pacmaker. He also
told me to increase my Losartan to 50mg once a
day. You  suggested 25 mg twice a day. Which do
you think would be better for me  considering my
medicine history.
```

The majority of messages or themes were about provider visits and care outside

the system. An example of this is "I received my first infusion of Remicade yesterday,

Nov 11, 2013, at a hospital in (town) as per an order from Dr. A". Another message

reads:

```
Hi--Just got home from G Hospital  I went there as it was
an  emegergency.  Had septic shock with hardly any blood
presssure. ICU for 4 days  ad 5 days extra.  Feb 2 went in.
Gave me 10 liters of fluid, dobutamine, and  hydrocortisone
20 mgm daily. Received cefitraxone, vantin and amoxicillin.
Have been on IV lasix for 4 days. Balancing coumadin levels
will talk to XX. Infectious disease physician wants me on
```

```
Amoxixillin 875 for 10 more  days.  Had strept-pneumococcal
infection.    Can you please provide me with the following
from a Dr. B and Dr. S  Amoxixillin 875 mgm 1 tid for 10
days which they gave me some.  another rx for Amoxiicllin
875 they recommend I have at home if I ever run an  fever
or feel a cold is coming on and then go to the Dr.  Lasix
40mgm  1 daily I have about 3 lbs to get rid of yet
Potassium 20 meq while on lasix 1 daily.   Thank you
```

Blood glucose/blood pressure/vital signs. This topic included themes that mostly consisted of reports of fingerstick glucose results. These themes account for 68 or approximately 3.9% of the themes overall. There were some results of monitoring blood pressure and other vital signs, which are examples of patients' self-management techniques. One comment of a secure message included "I went on vacation and forgot my insulin and although my numbers have been great I want to ask you if it is wise to stop my insulin". Overall the messages containing blood sugar results were very difficult or nearly impossible to read and decipher. For example, one SM user documented the following:

```
Hi R, The following are my Blood Sugar tests in Reverse Chronological order
1/10/13: 9am: 147, 3am: 131, 1/9/13: 5pm: 112, 8am: 151, 1/8/13: 5pm:129,
7am:
172, 1/7/13: 6pm: 246, 10am:177, 3am: 205,
1/6/13: 11pm: 132, 9am: 193, 3am: 238, 1/5/13: 5pm: 252, 9am: 176, 3 am:
222,
1/4/13: 10pm: 137, 9am: 213, 1am: 127,
1/3/13: 5pm:157, 9am: 278, 3am: 184, 1/2/13: 6pm: 108, 10am: 164, 1/1/13:
5pm:
197, 10am: 165, 12/31/12: 5pm: 131, 9am:
174, 3am: 212, 12/30/12: 10pm: 134, 9am: 202, 3am: 212, 12/29/13: 8pm:
189,12/26/12: 6pm: 238  8am: 172,.
```

Another SM user providing blood glucose information failed to relate the values to the time of day:

```
My blood sugar readings in the morning start out high and I
am taking 20 units of insulin at night.  The most recent
readings have been as follows: 147, 151, 172, 116, 136, 122,
140, 127, 116, 150.  That's for about 2 weeks.  Can I
increase my insulin to 22 or 23 units?
```

Another patient's results are as follows:

> My blood glucose numbers seem more consistent with the
> addition of the LANTUS, but they are high. Less spikes and
> lows but running between 170 and 280. 7 day AVG is 187
> testing 3-4 times a day. Please advise any adjustment or
> forward this message to the people in Pharmacy that can
> adjust and monitor diabetics as I do not have them in my
> Secure Messaging menu yet.

Complaints and concerns. This topic is comprised of themes including the listing of patient complaints and concerns about their care and complaints about the VA healthcare system. The themes containing patient complaints and concerns comprised 66 (3.8%) of the total. Some messages and themes contained within this topic reflect dissatisfaction and some are complimentary. An extreme message containing complaints about issues is from a frequent user of the SM system and follows:

> got message. E WILL NEVER RET. CALL FOR f/u c GI. INCOMPETANT AND
> ANGERING.   saw dr. D--brilliant. says need mri asap for surgery-fusion
> possibility----disk is ballooning out and shrinking. she calls it a
> fragment. says it is moving in and out so pain changes in intensity.
> projects in 5 yrs. will be bone on bone, for sure. I know it needs fused
> now. why wait 5 yrs.?   she has currently seen the bones are stressed and
> the disk will start to shrink. can X hosp do mri since this hosp has
> only 1 machine and it is better to get it done for surgery preparations
> that i hope she will do, as well. trust her, but she has no bedside
> manner whatsoever. i waited 6 months perhaps for initial mri last year
> when evidence of radiculopathy was seen already in sept of 2012 and
> politely ignored. i have definately seen the VA leave me in unnecessary
> pain and my lawyer atty S, ltd, agrees. will not pursue VA since limited
> recovery. would only have done if had cancer dx, delayed by a prior
> primary, who is NOT you. i am glad, as an aside, that he knows there are
> 4 clear areas i wrote Pres. Obama and Mark Kirk about that he will f/u
> with a letter to support all contentions that i raised. you have done me
> no harm. EUREKA! WHAT A RELIEF!

Another message of another patient expressing concern contained the following:

> I MISSED MY APPOINTMENT YESTERDAY I HAVE NOT HAD A CAR IN 10 DAYS I HAVE
> BEEN UNABLE TO ATTEND PHYSICAL THERAPY. MY ANKLE IS HURTING I THINK   I
> RE-INJURED IT. AM I SUPPOSED TO FOLLOW UP WITH NEUROLOGY? OR ITS NO BIG
> THING THAT THEY FOUND SOMETHING ON MY MRI I DON'T HAVE ANY RITALIN I'M
> SUPPOSED TO GET THAT EVERY MONTH I RAN OUT OF PAIN MEDS BECAUSE THE
> COMPUTER AT MY GOV.COM WAS OFFLINE. I TOLD MY PREVIOUS DOCTOR I DON'T LIKE
> ABILIFY CAN I TRY A DIFFERENT MEDICATION ALL THIS IS FALLING ON DEAF EARS?
> MY BACK HURTS MORE WITH THIS COLD WEATHER I GUESS I'M WASTING MY TIME EVEN
> SENDING THIS FUCKING MESSAGE

Another was a note of dissatisfaction over loss of former treatment no longer available. The message was not angry in tone, but it was rather lengthy and conveyed unhappiness with the system change. A second theme in this message was listed under the topic of symptoms:

```
Here are the entries that would have been recorded by the therapists at
the VA gym and pool under the old system of patient care.
Journal for December Do NOT Reply
I cannot tip my head back or look backwards when driving in reverse
without pain. I will have to go to the chiropractor.
6   VA pool therapy constant tingling or numbness in both feet. Used
continual hip flexor exercises to restore normal feeling in my feet.
7   VA therapy exercise class and I experienced continual dizziness and
balance problems for the full half hour. After class my blood pressure was
117/84 and I  had not taken any blood pressure medication this morning. My
guess is that my pulse rate was too high.
10  Neck adjustment. I am now able to look behind and over both my
shoulders and tip my head back to drink. About 7:15 am - 3 floaters in
right eye lasting about 15 minutes.
11  VA pool therapy. Pool temperature 97 degrees. Hands and feet tingle
during exercise class.
12  Neck pain varies from 4 to 8 on right and left side. Turning my head
to the left increased the pain to 8.  Turning my head to the right
increased the pain to 6.
13  Last night I slept with a special pillow and my neck is almost as good
as December 10th.
15  Neck flexibility same as December 10th except pain level 1+ and
occasional stabbing pain between 4 to 6.
16  Neck very sore, right side stabbing pain 4 to 6. Used neck support.
17  Neck adjustment, pain reduced to occasional 2+ stabbing on right side.
18  VA pool therapy constant tingling or numbness in both feet and hands
again. Used repeated hip flexor exercises to restore normal feeling in my
feet. Avoided side stepping and side stretching exercises.
19  VA gym class without dizziness and occasional tingling in both hands.
20  VA pool therapy class only occasional tingling in both feet and hands.
Avoided side stepping and side stretching exercises.
21  Neck adjustment, flexibility good, occasional stabbing pain on right
side 3+
31  Neck adjustment, flexibility better, no stabbing pain on either side.
```

Response to provider. Of the 61 (3.5%) themes that are clearly a response to a

question asked by the clinician, some have only several words such as "thank you".

Some messages include emoticons, such as "Thanks, I appreciate it :=]".

However some of the responses were more lengthy, as in the example from a

patient requesting a specific medication displays and is clearly a response to a question

posed by the provider in a previous component of a SM thread:

```
It is pure tribulus extract with other ingredients; dicalcium phosphate,
microcrystalline cellulose, stearic acid, magnesium stearate,
croscarmellose  sodium, silicon dioxide, aqueous film coating (purified
water, hydroxypropyl  methylcellulose, polyethylene glycol)  I thought it
would be worth a try. A  friend uses it and seems to work well. Let me
know.
```

This message was also a response to a provider's query, "Per your request, the

Synthroid is 50 mcg. Merry Christmas". There were many replies, which were clearly

relational in tone; an example of which was "Hi J, I respect your good advice. If you think it would be beneficial than I will come in for a consult".

Conclusion. In summary, 1200 secure messages were reviewed. From those messages, 1720 themes were identified that captured the intent of what was being said within the messages. Those 1720 themes were then reduced to concentrate the data to provide an efficient representation of the large volume of data, as suggested by Krippendorff (2013). That reduction resulted in the identification of ten topics that represented information conveyed by the patients or their designated representative to their providers, within their secure message. Requests for medication refills, questions about medications, requests for changed dosages of current medications composed the topic entitled Medications, which was the most frequent reason for messaging. The other topics in descending order were then reviewed.

Question Two

What is the relationship between SM topics discussed and the gender of the patient?

Analysis and unitizing. Secure messages were reviewed by gender of the patients. Of the total of 1200 messages, 1040 secure messages (86.6%) were written by men or family members or significant others of men patients. Women writers of secure messages numbered 160 or 13.3% of all messages written.

Sampling, Coding, *Reduction, Abductive inferring and Narration.*

Determination of which of the 1720 themes were written by gender required further analysis. Themes were divided into those written by men and those written by women. Then each group of 1471 (87%) themes written by men and 249 (14.47%)

themes attributable to women were then parsed to determine which gender wrote how many of each types of the ten topics overall. These results were then calculated to measure the part of the whole for men and women entries and displayed in Table 7. Chi square statistics were computed for each theme by topic and gender. Chi square results for three topics; medications, symptoms and blood glucose/VS results, exceeded the critical value [$\chi^2 = 6.64$, $p=0.01$] and are presented in Table 7. No other themes were statistically associated.

Table 7

Breakdown of Themes by Topic and Gender, χ^2 Results

Topic	Men	Women	χ^2 diff*
	n=1471 themes (%)	*n*=249 themes (%)	
Medications	533 (36.2%)	61 (24.4%)	12.973*
Comments/Quest to prov	204 (13.8%)	38 (15.2%)	0.342
Symptoms/Changes in Cond	185 (21.4%)	76 (30.5%)	53.280*
Appointment	110 (7.4%)	20 (8.0%)	0.094
Need results of test/Proc	90 (6.1%)	7 (2.1%)	4.377
Consults	88 (5.9%)	21 (9.6%)	2.156
Outside Appt/Outside Hosp	86 (5.8%)	6 (2.4%)	4.968
Blood Glucose/VS	66 (4.4%)	2 (0.8%)	7.609*
Reply to Prov Message	56 (3.8%)	5 (2.0%)	2.015
Complaints/Concerns/Problems	53 (3.6%)	13 (5.2%)	1.511

Note: 1 degree of freedom (df),
* $p=0.01$

Cross-tabs were calculated for these three topics and are displayed in Table 8.

Table 8

SM Topics; Meds, Symptoms, and Blood Glucose/VS Cross-Tabulation

Topic	Gender		Yes	No	Total
Medications	Men	Count	533	938	1471
		% within gender	36.2	63.7	100
		% within meds	89.7	83.3	85.5
		% of total	31.0	54.5	85.5
	Women	Count	61	188	249
		% within gender	24.4	75.5	100
		% within meds	10.2	16.9	14.4
		% of total	3.5	10.9	14.4
	Total	Count	594	1126	1720
		% within gender	34.5	65.4	100
		% within meds	100	100	100
		% of total	34.5	65.4	100
Symptoms/ Changes in Condition	Men	Count	185	1286	1471
		% within gender	21.4	87.4	100
		% within symptoms	70.8	88.1	85.5
		% of total	10.7	74.7	85.5
	Women	Count	76	173	249
		% within gender	30.5	74.4	100
		% within symptoms	29.1	11.8	14.4
		% of total	4.4	10.0	14.4
	Total	Count	261	1459	1720
		% within gender	15.1	84.8	100
		% within symptoms	100	100	100
		% of total	15.1	84.8	100
Blood Glucose/VS	Men	Count	66	1405	1471
		% within gender	4.4	95.5	100
		% within blood gluc/vs	97.0	85.0	85.5
		% of total	3.8	81.6	85.5
	Women	Count	2	247	249
		% within gender	0.8	99.1	100
		% within blood gluc/vs	2.9	14.9	14.4
		% of total	0.1	14.3	14.4
	Total	Count	68	1652	1720
		% within gender	3.9	96.0	100
		% within blood gluc/vs	100	100	100
		% of total	3.9	96.0	100

Men constituted the majority of veterans in the sample. Men followed and

reviewed their blood glucose and vital sign monitoring significantly more than women

did; women accounting for less than 1% of the entries under this topic, and all of these were related to review of blood pressure results. An example written by a man was:

```
Sorry it took so long to get in touch,these are my blood
pressure reading after I start takeing Valsartan 80MG TAB.
two in the morning and one at night.12/17/12 was 111 over
76, 12/18/12 115 over 78 12/19/12 109 over 76 12/20/12 119
over 80 12/21/12 123 over 78 12/22/12 127 over 81 12/23/12
126 over 80 12/24/12 124 over 80. Today 01/10/13 was 119
over 76. I change my diet and ride my exercise bike every
other day.
```

Women wrote more messages related to symptoms such as:

Not feeling well since Saturday, currently at work, but going home shortly. My pain in in my neck, shin(left), lower back and hip (left). Since this morning I have taken meloxicam (2) and acetaminophen 325 (1) no relief.   Want to come in for a shot, but no appointment. Can I come into ER and get one or do I have to make an appointment with doctor?? Also need another consult for back doctor.   I can be reached at xxxxx in about 45min from now 1305

And another woman wrote:

ok the xray does not sound like what we need. can you put me in for

creams and anti famatory. but 800 mg mortin is not working.   I wanted to ask

about my acid refelx I was told this from navy and 800 mg of mortin. Is this

true? and what about arthritis but I was over weight when I got out. if I can put

in i will but I know that I would need a dr to back me up. thanks for everything.

These messages regarding symptoms written by women do not vary much by substance as compared to men, simply that there were 50% more written by women than by men.

Conclusion. Women made up 13.37% of total messages in this sample, men the remaining 86.6%. But messages written by women contained more themes than did messages written by me. The topics of requests for appointments, complaints about the VA system, replies to providers' questions and questions to providers, resulted in similar

percentage of responses by women and men. Although requests for consults were nearly

evenly sought, a subset of consults included requests for durable medical equipment.

Only men wrote messages in relation to orders for durable medical equipment, and they

asked for aids, scooters, blood pressure monitors, or other equipment. Women

documented symptoms significantly more than men. Men were the only ones to

document blood sugar results, though women twice reported blood pressure results. A

significantly greater percentage of men requested medications through SM, as well as

requesting results of test or procedures. Conveying the results of appointments with

providers outside the VA and discussion of hospitalizations outside the VA occurred

more frequently with men than with women.

Question Three

What is the relationship between SM topics discussed and age of the patient?

Analysis and unitizing. Within this sample, the youngest user of SM was age 27 and the

oldest was age 92. The breakdown by numbers of participants based on their ages is

denoted in Table 9. The greatest use of SM within this sample occurred in the age range

of those 55 to 64 years. The next greatest use of SM was demonstrated by those in the 65

to 74 age range, and was nearly identical to the 55 to 64 year olds by frequency.

Following those two age ranges were the 45 to 54 year olds, followed by 75 to 84 year

olds. The least frequent use was by the following age ranges in decreasing order: those

35 to 44 years, 25 years to 34 years, and finally those greater than 85 years of age. A bar

graph of these age ranges, including the numbers within each category is seen in Figure 2.

Table 9

Secure Messages by Age Ranges and Topic Addressed

Age Range	# in group (%)	Top Topic	Second Most Freq Addressed Topic
25-34	54 (4.5%)	Medications	Symptoms/Changes in Condition
35-44	83 (6.9%)	Medications	Comments/Questions or Info to Provider
45-54	206 (17.1%)	Medications	Symptoms/Changes in Condition
55-64	351 (29.2%)	Medications	Comments/Questions or Info to Provider
65-74	334 (27.8%)	Medications	Comments/Questions or Info to Provider
75-84	128 (10.6%)	Medications	Comments/Questions or Info to Provider
85-94	44 (3.6%)	Medications	Reports of Outside Appointments/Outside Hospitalizations/ED Visits

Figure 2.

Use of SM by 10 year age increments

Participants by Age Range
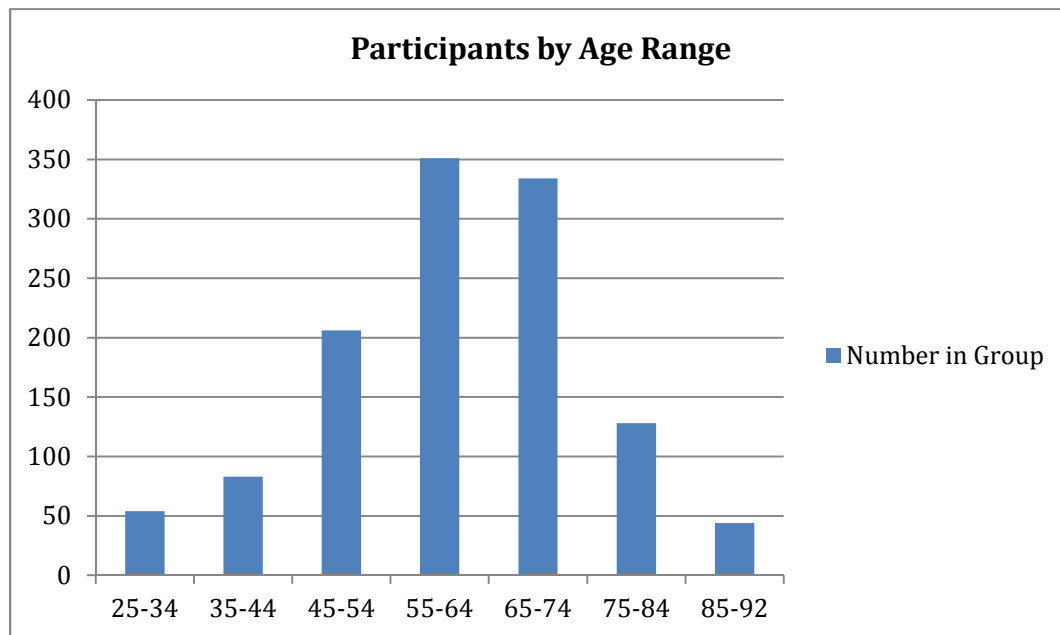
Sampling, Coding, ***Reduction, Abductive inferring and Narration.*** In this question the narration was the explanation of what was found in the review of SM by age. Findings for each age category follow.

25 to 34 year old group. Within this group there were 83 message themes. The greatest number of these fell under the topic related to Medications. The majority of the themes were requests for refills, but additional themes included suggestions to increase the number of pills dispensed and the need to increase pain medication. The next most populated topic was the listing of symptoms or changes in condition. These include updates on symptoms and complaints ranging from sore throats to rashes. Other symptoms included complaints of chest pain, yeast infections, rashes and pain. There were some requests for appointments, labwork and consultant requests. There were no reports of blood glucose monitoring or vital sign results.

35 to 44 year old group. The 35 to 44 year old grouping comprised an only slightly larger sized membership than the younger (25 to 34 year old) group just mentioned. This group's most frequent topic was also related to medications: requests for refills, the majority of requests for narcotics or pain relief medications. The next two next most frequently covered topics were comments or questions to their providers and questions regarding appointments. Of interest in this group of messages was the fact that no one wrote about any blood sugar/vital sign results, there was only one theme of concern, one request for a consultation, and not a single item in relation to complaints about the VA. Though the number of persons comprising this group was slightly greater that the 25 to 34 year old group, the younger group had 21 message themes related to

symptoms whereas this group of 35 to 44 year olds had only 3 messages regarding symptoms.

45 to 54 year old group. Greater in number than the previous two age groups, the 45 to 54 year olds had the most message themes related to medications, mainly requests for refills and the majority of refills were related to Schedule II narcotics, benzodiazepines, opiates, and analgesics. The second largest topic grouping for this group was the topic of symptoms. The symptoms ranged from those of urinary tract infections to pain to worsening symptoms, chest pain and anxiety. More than 78% of the symptoms listed were for negative or declining symptomatology. It is interesting to note that within this grouping were 14 requests for test or procedure results. This group had an increased number of requests for consultations with specialists.

55 to 64 year old group. The largest group of patients using SM was the 55 to 64 year olds. This group was larger in size than the previous three groups combined. The overwhelming request in this group of individuals was their need for medications. Over a third of all requests in this group were for medications: refills and increased dosages. Again, over a third of the requests were for Schedule II narcotics, benzodiazepines, opiates, and analgesics. This group also noted that they lost medications, medications were lost or stolen from their mail or that medications did not arrive in the mail.

Symptoms in the 55-64 year group were mostly negative at 73%, though some were reports of improved symptoms or conditions. A quarter of the comments to the provider contained positive messages of improvements in conditions. This age group had more reports of blood glucose testing along with more self-monitoring of vital signs. There were also increased numbers of complaints, frustrations, and some who voiced

anger at the particular VA or overall VHA. Threats to providers were made, "I am not here to threaten you or scare you but...", another reads "Dr X ignored this, so if I have cancer, they are in serious trouble".

People in this 55-64 year group also wrote messages about their appointments, requested that additional labwork be drawn, clarified dates and times, and cancelled appointments through SM. Perhaps because of the age of this group, this was the first age group to make comments about what is referred to as durable medical equipment. This topic of medical equipment was not addressed in those less than 55 years of age. These requests were for occupational therapy items, assistive aids and other products. There were, as in other age ranges described, requests for results of procedures and tests. There were a significant number of requests for appointments with specialists and more reports of outside hospitalizations, trips to emergency departments, and surgical procedures done elsewhere.

65 to 74 year old group. The second largest group of patients was comprised of 65 to 74 year olds. There were increased self-monitoring activities in the area of blood glucose and vital sign reports than in younger groups. Consult requests were on par with the 54 to 65 year old group. Message themes regarding medications were numerous, again with requests for schedule 2 narcotics, benzodiazepines, opiates and analgesics but at a rate of nearly half that of the younger group aged 55 to 64. There were nearly the same number of requests for results of tests and procedures, but based on size of the group approximately the same number of messages regarding symptoms. Yet only about half of the symptom reports were for worsening symptoms—versus two-thirds of symptoms cited as being worse by the younger group of 55 to 64 year olds. Though a

somewhat smaller group, reports of usage of outside VHA providers or facilities was approximately the same as the younger group. The number of complaints or personal concerns was equal to those of the 44 to 55 year olds and included worries over cardiac health, worry about the spouse's health, as well as concern over costs and insurance issues.

75 to 84 year old group. The 75 to 84 year olds were a smaller group than the 45-54 year olds, but surprisingly as large a group as the 25 to 44 year olds—a combination of users of *two* younger-aged groups combined, to make up a group of users in their 70s and 80s. This group overwhelmingly requested medication in their use of SM. A quarter of the medication-related requests were for schedule 2 narcotics, benzodiazepines, opiates and analgesics. There were several reports of blood glucose results and vital signs. There were a surprisingly smaller number of requests for durable medical equipment in this age group where there might be an increased need. Requests for consultants or specialists also dropped off. Reports of symptoms were less overall, and half were of worsening symptoms. There were, for the size of the group, a significant number of commentaries to their providers. The comments varied from thanks for care and happy holiday wishes to requests for information on long term care and assistive living facilities to requests for assistance at home, help at home, requests for appliances, and food. There was a smaller list of complaints and concerns regarding the VA in this group.

85 to 92 year old group. The 85 to 92 year old group was nearly equivalent in size to the 25-34 year old group. Their number of complaints and concerns were nearly similar-older to younger group-as were their requests for consultations with specialists. The older group monitors blood glucose and vital signs, unlike the younger group and

reported those results to their providers. There were fewer requests for schedule 2

narcotics and benzodiazepines than requested by those in younger age groups.

Symptoms were nearly all worse. This group continued to see providers in the private

sector. There were more requests for explanations to providers, a degree of

quarrelsomeness with providers ("I had an obstruction in my small bowel. They tell me

not to eat fiber but I think that is bad advise"), and a small number of complaints with the

VA system and charges.

     Conclusion. Age was not a determinant of use of a SM system. The greatest

number of users of the system were those aged 55 to 74 years.   Unlike their younger

counterparts, the 45-54 year olds have symptomatology as their second most frequent

topic written of, and symptoms continue as an frequently used topic in all remaining age

groups. Requests for medications was the most frequently repeated topic for all age

groups. The second most addressed topic varied slightly between the topics "symptoms

and/or changes in condition" and "comments or questions or information sent to

provider". Only in the age group greater than age 84 does the second topic of discussion

vary, becoming "report of outside appointments".

Question Four

     What were the patterns of use of SM by patients and caregivers?

     Analysis. Research questions Four, Five and Six were related to the pattern of use

of SM. As noted in the definitions section of Chapter 1, pattern of use was

operationalized as the frequency or the occurrence of use of SM by the user. In the

definition it was noted that pattern of use investigated the repeated behavior of use of SM

every Monday morning or during the early hours of the day.

In Chapter 3, description of why and how the subset for this and the following two questions was presented.   Briefly, the subset studied was comprised of 600 messages taken from the sample. Each of those records was opened to determine the date, day of week and time of day that each message was written by the patient. The gender and ages of the patients were noted for each record. These records were reviewed to determine how patients used SM by date and time. Figure 3 depicts how patients utilized SM by day of week. Increased numbers of notes were written on Tuesdays and Thursdays than on other days of the week. Fridays were the days of week when the fewest notes were written and similarly very few messages were written on Sundays.

Figure 3

Use of SM by Day of Week for Patients and Caregivers
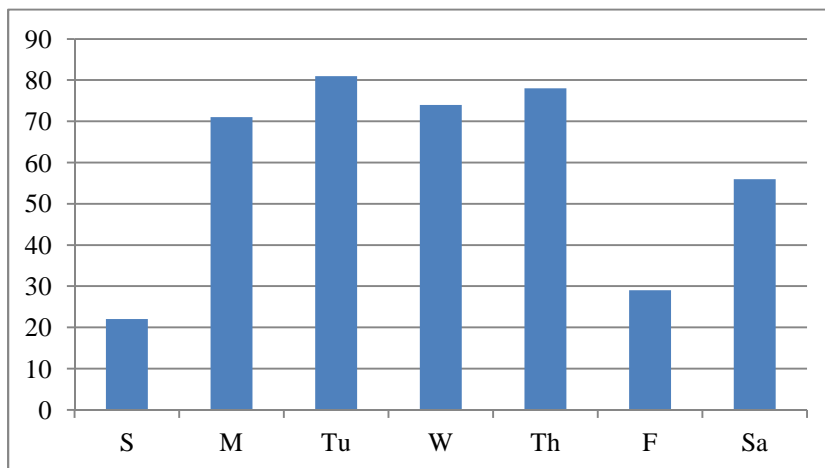
The times of day during which secure messages were written were also considered in determining pattern of use. There were only 6% of messages written later at night; 36 messages were written from 9 p.m. until midnight. Overall, few messages were written very early in the morning; for example 15 messages or 2.5% of all messages were written between midnight and 6 a.m. The number of messages written during three hour increments during the day is presented in Table 12.

Table 10

Secure Messages Written During Daily Three-Hour Intervals (*n*=600)

Time of day	Number of messages (%)
Midnight – 0259	9 (1.5%)
0300-0559	6 (1.0%)
0600-0859	82 (13.6%)
0900-1159	165 (27.5%)
12noon-1459	150 (25.0%)
1500-1720	106 (17.6%)
1800-1959	46 (7.6%)
2000-2359	36 (6.0%)
Total	600

Although the intent of this research question did not include the premise of content of secure messages at various times of day, it was noted that there were two messages *in extremis* written either very early in the day. Those messages read:

```
0251 also, may need a break from PT.  i fall asleep almost while driving
on pain meds.  very bad.  no one can take me there. 0307 by the way, with
these shots, i would be able to walk around and carry things again?  is
that going to shrink the disk and put it back?  Dr. X said definite on
surgery.  so he changed his mind?  i have a uti, so that caused so much
pain i took 4 vicodin?

0427 EMERGENY........................I am coming in early this
morning....for blood and urine tests.....BUT I NEED THE UTI
MEDS..ASAP!!!!!   I started feeling it coming on Friday but nothing
happened until Sun night.......then Monday okay.......but this morning
terrible.  HELP.   And I even drank cranberry juice yesterday.PLEASE PUT
IN FOR URINE TESTS AND MEDS!!!!!
```

Most messages were simply messages that most people would write in a commentary to their provider in throughout the day. An example is seen here:

```
I did come in to see X this week on Weds and he was able to fix the
problem with my right ear mold but not the left Naida -- hence have booked
an appt. with you but the earliest in preferred early am was in December.
I have since  called back to request I put on your call list when there
are cancellations so hopefully will be able to see you within the next
couple of weeks.  As before there is no emergency but just a problem that
needs to be addressed. Thanks
```

Conclusion. A total of 600 messages were reviewed for any patterning that might be observed in their construction. The greatest numbers of messages written during the course of the week were written from 9 a.m. until 3 p.m. on Tuesdays or Thursdays.

Question Five

What are the patterns of use of SM as differentiated by patient gender?

To answer this question all SM dates, day of week, time of day and gender were copied to two MS Excel workbooks. One file included only the men; the other worksheet was comprised of women. Of the 600 messages retrieved, 522 (87%) records belonged to men and 78 (13%) were records of women. Each group was reviewed for entries made by day of week and time of day.

Starting with Question Four, a review of all 600 messages in the sample subset demonstrated that the majority of secure messages were written on Tuesdays, Wednesdays, and Thursdays. Question Five reviewed this issue of pattern of use by gender. The following trends differed, as seen in Table 11. Messages by men were written most frequently on Mondays, Tuesdays, and Wednesdays. Messages were written most frequently by women on Tuesdays and Fridays. Chi square statistics were computed for day of week and are presented in Table 11. Chi square results for Wednesdays exceeded the critical value [$\chi^2 = 3.84$, $p=0.05$] and. No other dates were statistically associated.

Table 11

Secure Messages Written by Day of Week, by Gender, χ^2 Results

Day of Week	Men (%)	Women (%)	χ^2 diff*
Sunday	39 (7.4%)	7 (9%)	0.217
Monday	96 (18%)	12 (15%)	0.415
Tuesday	96 (18%)	17 (21%)	0.514
Wednesday	89 (17%)	6 (7%)	4.459*
Thursday	75 (14%)	12 (15%)	0.057
Friday	86 (16%)	18 (23%)	2.064
Saturday	41 (8%)	6 (7%)	0.002
Totals	522	78	

Note: 1 degree of freedom (df),
* $p=0.05$

Similar to Question Four which looked at the overall pattern of use of SM and in particular at this point, looked at use of messaging throughout the course of 24-hours, the sample was then reviewed for use during three-hour time frames during the day by gender. The overall review of time of day for all messages written resulted in the highest use of messages written from 0900 until 12 noon. In Table 12 the times of day were broken into three-hour intervals to demonstrate as clearly as possible which time frames were utilized most frequently by men and women to write their secure messages. Men and women both wrote the most messages (>50%) during the hours of 9 a.m. and 3 p.m. Chi square statistics were computed for the time of day in the respective three hour intervals. Chi square results for 3 a.m. to 6 a.m. exceeded the critical value [$\chi^2 = 6.64$, $p=0.01$] and are presented in Table 12. No other times were statistically associated.

Table 12

Messages Written During Daily, Three-Hour Intervals, by Gender, χ^2-Results

Time of Day	Number of Messages		
	Men (% of total)	Women (% of total)	χ^2diff*
0001 – 0300	8 (1.5%)	1 (1.2%)	0.029
0301 – 0600	5 (0.9%)	1 (1.2%)	12.309*
0601 – 0900	69 (13.2%)	13 (16.6%)	0.684
0901 – 1200	145 (27.7%)	20 (25.6%)	0.155
1201 – 1500	128 (24.5%)	21 (26.9%)	0.210
1501 – 1800	113 (21.6%)	8 (10.2%)	5.469
1801 – 2100	43 (8.2%)	7 (8.9%)	0.048
2101 - 2400	11 (2.1%)	3 (3.8%)	0.900
Total	522 (87%)	78 (13%)	

Note: 1 degree of freedom (df),
* p=0.01

Conclusion. Men wrote more messages on Monday, Tuesday, and Wednesday

and from 9 a.m. until 3 p.m. Women wrote the most messages on Friday. Women also

wrote the most messages during the same time period as men, that is, 9 a.m. until 3 p.m. .

Question Six

What are the patterns of use of SM as differentiated by patient age?

The ages of writers within this subset of 600 secure messages was 27 to 92 years.

The ages of all within this subset of 600 of all secure messages are shown in Table 13.

To determine the most frequently used time frames that secure messages were written by

age range required sorting by the times they entered messages. The first step required

sorting the whole list of 600 users and their messages by age range into ten-year

increments. The ten year increments were divided as follows: 25 to 34 years, 35 to 44

years, 45 to 54 years, 55 to 64 years, 65 to 74 years, 75 to 84 years and 85 to 94 years.

Table 13

Ages of SM Users in Pattern of Use Subset

Age	Number of Users in Range (%)	
25 – 34	24	(4%)
35 - 44	37	(6%)
45 - 54	115	(19%)
55 – 64	165	(27.5%)
65 – 74	172	(28.6%)
75 – 84	68	(11.3%)
85 – 94	19	(3%)
Total	600	

The mean, median, and the mode were displayed for easier reading in Table 14.

The age range is representative of the overall study sample--the median is only off by 1.5

years. The mean and mode are nearly identical in this subset when compared to the

sample of 1200, with the mean of the entire sample being 61.14 years and mode of entire

sample being the same at 66 years of age.

Table 14

Age range in Years, Mean, Median, Mode Ages of Pattern of Use (POU) Sample

	Total *n*	Age Range	Mean	Median	Mode	# Messages written by another
Total in POU Sample	600	27 - 92	61.06	61.5	66	31

These notes were written in each of the specific months, July 2012, January 2013,

February 2013, April 2013, and December 2013. Within this subset of 600 messages, the

time that notes were written ranged from 0001, that is, one minute after midnight and

written by an 81 year old, until 23:47 (11:47 p.m.) written by a 63 year old. A review of

these data revealed the following information.

The time of day that messages were written was analyzed. The use of SM by age

range and time of day is presented in Table 15.

Table 15

Secure Messages by Age Range and Time of Day

Age Range	Midnight to 2:59 a.m.	3 a.m. to 5:59 a.m.	6 a.m. to 8:59 a.m.	9 a.m. to 11:59 a.m.	Noon to 2:59 p.m.	3 p.m. to 5:59 p.m.	6 p.m. to 8:59 p.m.	9 p.m. to 11:59 p.m.
25-34	--	--	4	7	4	6	2	1
35-44	--	--	10	9	7	7	0	4
45-54	5	--	13	23	38	22	9	5
55-64	2	4	20	43	34	33	15	14
65-74	--	2	26	59	45	20	14	6
75-84	2	--	6	19	15	17	4	5
85-94	--	--	3	5	7	1	2	1

The busiest time of day for SM is 9 a.m. until 6 p.m. numbering 418 and resulting

in nearly 70% of all messages written. Few secure messages are written between

midnight and 6 a.m., only numbering 15 and constituting only 2.5% of the sample. The

groups with larger numbers of secure message writers were those within the 65 to 74 year

old group and the 55 to 64 year old group, writing 172 and 165 messages respectively

and both these groups wrote messages later into the evening, than did other age groups.

Finally, also investigated was the day of the week during which secure messages were written. When individual age ranges were reviewed, 25 to 34 year olds wrote 50% or 12 of the messages in this sample on Tuesdays with no messages written on Sundays. In the 35 to 44 year old range, nearly 30% were written on Mondays and 23% on Tuesdays. In the 45 to 54 year old range, the majority of messages were written on Mondays and Fridays. Fifty-five to 64 year olds wrote messages in the sample predominately on Fridays with a nearly even distribution of the remaining notes on Monday through Thursday.

In the 65 to 74 age range Mondays, Wednesdays, and Fridays were the days utilized most frequently to message, with Tuesdays and Thursdays totaling about five messages behind. The 75 to 84 range was fairly evenly distributed Monday through Thursday. In the 85 to 94 year old range, nearly one third of messages were written on Mondays and only three messages of the total 19 messages written on the weekends .

Conclusion. In conclusion, the youngest and oldest age ranges wrote notes predominately on Mondays and Tuesdays. In this sample, the greatest numbers of notes were written by those in the 65 to 74 year age range and the second highest age range was the 55 to 64 year olds. Combined, those two groups accounted for more than 56% of the secure messages in this sample. Those SM users wrote their notes most frequently on Mondays, Tuesdays, Wednesdays, and Thursdays. Weekends only accounted for l5% of all secure messages written and included those in all age ranges.

Summary of Results

The results of data analysis were presented in this chapter. Participants in this review included patients utilizing a SM program at a health care center in the Midwest. Detailed answers to each of the six research questions were provided.

The age range of those writing secure messages was 27 to 92 years of age. In the first three questions the study reviewed 1200 secure messages written by patients. Each message was thoroughly reviewed to determine what it was that the veteran was actually writing about. The contextual information within the message was considered the theme. Messages contained as many as four themes. Themes totaled 1720. These themes were then reduced to ten topics which captured the essence of the themes, using Krippendorff's methods for content analysis.

Research Questions Four, Five, and Six required a different method of analysis. Half of the total number of messages were reviewed to capture the time the note was written, the day of week, the gender, and age of the veteran. These 600 messages were reviewed not for content but rather what the pattern of use of the messaging system would depict, to describe the manner in which veterans use the SM system.

Findings were presented by research question. Conclusions for each research question were presented. As demonstrated by this study, the SM system was utilized most frequently as a mechanism to refill medications. Within the topic of medications however, veterans also asked logical questions regarding the medications taken and questioned the providers of other cogent issues related to their health. The next most populated topic was a listing of the veterans' symptoms or changes in condition. Under

these topics and those such as blood glucose monitoring results and in comments to providers, strong and logical discussions were noted related to self-management skills.

Numerous messages were expressions of self-management skills. Whether an individual was reporting fasting blood glucose, monitoring a skin rash, or questioning the next step in their treatment plan, the premise of all these were reflections of self-management skills. It was heartening to see the VA continue to support and encourage the use of SM, and ultimately self-management.

Chapter Summary

A study of 1200 secure messages was undertaken at a healthcare facility in the Midwest. The ages of veterans writing secure messages ranged from 27 years to 92 years of age. The mean age was just over 61 years. Men accounted for 87% of the study participants, while women wrote 13% of those messages reviewed. Family members or friends wrote 77 messages for the veterans. For Questions Four, Five and Six, a subset of the original sample was devised to better review pattern of use in secure messages.

Findings were displayed for each research question. Examples of individual secure messages were reviewed. Conclusions for each research question were presented.

Chapter 5

Introduction

Secure messaging (SM) is an additional technology that is being utilized within healthcare to assist in providing patient-centered care. Secure messaging allows patients to communicate with their providers over a secure network. The purpose of this study was to describe the themes discussed using SM, the pattern of use of SM, and whether the themes discussed and/or the pattern of use varied based on gender and age of the secure message user. Patients and in 77 cases, caregivers, wrote 1200 messages that were reviewed for this research. From those messages, 1720 themes were extracted. Utilizing techniques supported by Krippendorff, each of the 1720 themes was sorted into one of ten overall topics that best described what the patient was expressing in the message. The pattern of use was determined by an extensive review of 600 messages, where time of day, and day of week, gender and age was used to further describe the use of the system.

Content analysis was utilized to examine and parse the messages, themes, and topics that were reviewed. An explanation of content analysis accompanied each question where it was used. Other questions were examined using descriptive statistics. In this chapter the findings are discussed within the context of theory, implications for practice, nursing informatics, and policy development are identified and discussed.

Discussion

Secure messaging has made an impact on patient care and is exemplary of patient-centered care not only because the patients are the focus of the interaction (Brennan, Downs & Casper, 2010; IOM, 2001; Rogers, 1951) but also that patients occupy a role using technology as a driver of the relationship. In this study, ten topics were deduced

through reduction of 1200 messages and 1720 themes. Moreover, secure messages frequently contained more than one theme per message in several instances. Some messages also conveyed underlying issues and emotions required judicious reading to discern the fine points.

In this study, medication-related content was the topic that accounted for nearly a third of all SM themes, and most of the themes under this topic were requests for refills of medications. However, there were also some patient discussions related to medications they wanted to take or were currently taking. These findings are similar to those obtained by Sitting (3003) more than a decade ago. In that study unencrypted email between patients and physicians was reviewed. Twenty six percent of the email messages were about medications and treatments, 22% were about symptoms and 20% of the email messages requested action about the patients' specific medications such as requiring refills.

Moreover, in this study, the requests for medications were for stronger, higher dosages, and refills sooner than should be allowed. This was not reported in any previous research studies. It also appeared to be non-discriminatory; the issue pervaded the youngest users of the system, those in their 20s, through the 90 year olds.

What has not been reported in the literature is gender differences in secure message use in regards to medications. The only area where requests or comments or a refill for medications was *not* the overwhelming request in secure messages was found in the women studied here. Medications were the *second* most frequent topic written about by women, bested only by the topic Symptoms. Reasons for this were not discussed in

the secure messages themselves. It is possible that women read the instructions to refill medications in other manners or in the appropriate areas of the Website.

Refilling of prescriptions was done using the secure messaging system despite patients' access to a specific area on the MyHealtheVet (MHV) Website that was designed to refill medications. Additionally, veterans have the option to use the medication refill system using a telephone, as non-veterans would do at a local drug store. Patients also have the ability to refill medications by dropping a postcard in the mail, which results in a refill automatically being sent to the patient. Patients may also show up in person and waiting in line for a refill at the pharmacy. There could be several reasons for their use of SM to refill medications. SM users may find that SM is much easier to access than the other systems available with the VA. Perhaps some of the patients have impaired hearing and refilling through a telephone line is not easy for them to use. Possibly patients use SM for medication refills because of the impersonal quality of it and thus there is no judgment or questions imposed upon them when refilling narcotics and other medications. Yet, this discussion of medications with providers in a secure message is an indicator of self-management. The patients can access the MyHealtheVet system, move over to the SM component of the Website, and carry on a conversation of sorts with their clinical staff members; asking questions, making suggestions for different types of medications, while not receiving judgments. It can all be accomplished in a more personal way and at their leisure.

After medications, the next most frequent topic within secure messages was that of Symptoms and/or Changes in Condition. While the percent of topics related to symptoms is less than noted in Sittig (2003) or by White, Moyer, Stern and Katz (2004),

it remained as the second highest category in this study. Certainly, when a person does not feel well or has non-emergent changes in their physical or mental health is it convenient to be able to sit and immediately write to the person who cares for your health—and this may be done day or night. With SM, patients no longer need to search their provider out, wait on the phone, or be told to call back at a later time. Moreover, the speed of a healthcare provider's response could influence use of SM. Secure messaging is convenient and though warned to not use SM in the case of an emergency, some healthcare providers appear to have a quick turnaround time when responding to their patients' secure messages.

Utilization of the Individual and Family Self-Management Theory (IFSMT) (Ryan and Sawin, 2009) as a foundation for this study was the appropriate theory to relate the use of secure messaging to self-management techniques by patients. Behaviors such as messages relating blood glucose monitoring, vital signs, requests for assistance to quit smoking, weight-loss, even medication changes are clearly reflections of self-management behaviors. In the dimension of context, the patients were able to access and utilize SM through the internet. This was true of people in all age ranges and of either gender. In the process dimension of IFSMT, the desire to utilize technology to self-monitor was also borne out; patients utilize SM throughout the day, morning, noon, and night, and Sunday through Saturday.

In this study, the third most frequent topic was questions, comments or information sent to the provider. Medications, symptoms or changes in their health condition along with these questions or comments for their provider are all indicators of self-management skills. In the IFSMT, Ryan and Sawin (2009) define self-management

as the tasks individuals undertake to live with one or more chronic conditions. The IFSMT was utilized with the premise that the use of SM is reflective of the incorporation of health-related behaviors into one's daily routines. In this study, review of messaging times utilized throughout the day and review of usage by day of week were determined to be important factors to be considered as indicators of operationalizing SM into daily routines.

Despite the fact that the greatest number of themes clustered under a single topic had to do with medications, these requests for medications are also indicative of self-management. More requests than would be expected perhaps were for Schedule II narcotics, benzodiazepines, opiates, and analgesics. Most messages were pleasant in tone. The other messages were the routine questions of patients needing to be assured that their health was alright. There seemed to be a need for interaction with a clinical person who knew them personally and who cared. The patients displayed the need for increased information and to question the next steps in their treatment, requested help with paperwork, requested to assistance to complete or fax a form, and questioned their diagnoses. This use of SM contained an interesting mix of questions and concerns and was clearly indicative of self-management. As knowledge and belief factors in the IFSMT support self-monitoring and self-efficacy, SM is another tool which enables veterans in this study to strengthen their role in self-care.

Reviewing themes and topics of SM by gender revealed that in this sample, men performed better than women in regards to vital sign monitoring and glucose monitoring. Whether due to the fact that few of the women in this review had diabetes or hypertension or that women generally do not monitor, was not reviewed for this study.

While women comprised just over 13% of the sample, they had 23% of complaints or concerns, and requested 22% of the consultations with specialists. Women wrote more than a quarter of all of the total number of messages related to symptoms or changes in condition.

Men composed 86.7% of the messages but wrote 50% more requests for medications than women and requested twice the number of themes related to test results than women did. Men also requested or reported 50% more on outside appointments with other specialists or on outside hospitalizations. Interestingly, Cohen and Stussman (2010) found otherwise: they found that women were more likely than men to refill a prescription and make an appointment online, using the Internet. In this study, men were the only ones to ask for durable medical equipment. Men also had twice the frequency of replying to provider messages than women did.

Women made up 13.37% of total messages in this sample, but accounted for approximately one quarter of the entire hospital enrollment. There was no true outcome to account for this, other than to hypothesize that more women were either currently active duty members or recently left active duty, members both of whom would potentially continue to utilize providers on the active duty side of the hospital, which does not utilize MHV or this SM program. The Department of Defense utilizes the military's version of MHV called Relay Health, which has a method of SM within that program. There was no other way to explain the disparity in the numbers of women participating in this study.

Findings in this study related to SM and age are consistent with those of Ralston et al. (2009). Ralston et al. reported that the greatest users of messaging in healthcare

were those 50 to 65 years of age. The greatest use of SM within this sample occurred in the age range of those 55 to 64 years. The next greatest use of SM was demonstrated by those in the 65 to 74 age range. In this sample this was evidence of a technologically-adept group of individuals greater than age 50, as Ralston et al. reported. It was also encouraging to see that nearly as many 80 and 90 year olds use the system for communication with their providers as did the 20 and 30 year olds.

The emotion and tone demonstrated in messages by veterans or caregivers of all ages and genders was usually very personal when communicating with the healthcare team. The tenor of the messages was relaxed. There appeared to be good relationships between providers and patients, as demonstrated in many of the messages displayed in Chapter 4. Mutual care for each other was evidenced in several message themes. Best wishes and happy holiday messages are prevalent. The veterans and their caregivers secure messages generally appear to be written with a comfortable tone.

Reviewing patterns of use in this study demonstrated that most messages were written between the hours of 9 a.m. and 6 p.m., and most frequently on weekdays. There are several possible reasons for this finding. It is possible that SM users are most active during these times because they believe their provider is more accessible and will be more responsive to their needs. Conversely, this finding may indicate that though many secure messages were written by work-aged people, during daytime work hours they may not be employed. Or, it could be that some of those employed individuals wrote secure messages from their place of work. There is no way to discern this information.

This is the first study to also look at pattern of use of SM. Within a subset sample of pattern of use, women accounted for 13% of the total sample, reflective of the percent of messages written by women in the full study. Pattern of use by age was also reviewed. In this subset, the age group with larger numbers of secure message writers was that of those within the 65 to 74 year old group, followed by the 55 to 64 year old group and these groups wrote messages later into the evening, than did other age groups. Weppner (2010) was the only author identified who found that men between 65 to 69 years having the highest use of SM. All other research pointed to use of those younger persons being greater utilizers of the Internet and its functionality (Jones & Fox, 2009; McInnes, Gifford, Kazis & Wagner, 2010).

Haun et al. (2014) recently discussed the perceptions of 32 veterans (79% men) using SM at two VA hospitals. The veterans expressed satisfaction with the timely manner of Secure Messaging communication, generally receiving a response from their primary care team within 48 hours. Veterans reported no problems understanding secure message responses from their primary care team members. Few veterans noted being uncomfortable sharing private health information through SM, or about their use of SM. Haun et al. reviewed the veterans' use of SM; the participants stated that they valued SM as it provided them 24/7 access to their clinical team. In the Haun et. al. study, the veterans also reported staff resistance to the use of SM. Although not investigated in the current study, inquiry into the issue of staff resistance or acceptance is critical to the future of the SM program.

Not clear was the extent of input by providers, or indeed whether any input by providers was sought in the development of the SM program at various locations. At this

healthcare center, nearly 60% of messages were answered within eight hours (S. Cech, personal communication, April 17, 2013), which could contribute to its use by patients. Review of secure messages requires attention to detail and thus requires extra time in the clinician's day. Unlike a telephone call, a secure message provides written proof of what was said by both the patient and the clinician. Thus, the secure message, now saved to the EHR, has become legal proof of discussion and instructions between clinician and patient. That legal record could cause some degree of pushback by providers to using SM. As a potential result of this, messages need to be constructed with clarity and with ease of understanding by the patient or caregiver. Byrne, Elliott, and Firek (2009) surveyed VHA clinicians who were utilizing a "home-grown" version of SM, called Portal Mail. They surveyed clinicians in primary care. Twelve out of 31 clinicians at that VA used the SM system. Those 12 clinicians communicated using SM an average of 1.71 message threads per week. Byrne, Elliot, and Firek noted that 60% of clinicians who chose not to utilize SM were thought to be experiencing "clinical adoption inertia", that is, an unwillingness to change and adopt SM system due for four reasons: information overload, paperwork burden, volume of computerized alerts, and additional tasks associated with computerized order entry.

Ralston et al. (2008) reviewed email in primary care settings and suggested applying a five dollar incentive for every message answered by providers. There are other ways to incentivize and encourage attention to messaging and the quality of responses. Whether that is recognition or publication of the clinical team for excellent work and turnaround time in the area of SM, it could also take the form of a simple awarding of a few hours of time-off for strong healthcare team support of SM. Staff

members should have recognition and reinforcement for a job well done and for work that is an add-on to an already stressed work environment.

The outcomes of this study have implications for users, clinicians, hospital administrators, and technical staff. This study could be the springboard to additional analyses of SM within the VA and elsewhere. There is a considerable potential for SM to impact clinical outcomes and patient-staff interactions. Education of these stakeholders on findings of this study could positively influence SM use as each moves forward in their use of this new technology.

Limitations

This study was limited by its size and the fact that it is generalizable only to a small population at a VA hospital in the Midwest. These results may not even be generalizable to other VA hospitals, and may not be congruent with results from non-VA hospitals. This VA was also different in that it also cares for a large active duty population, some of whose messages may have been reviewed in this study, though that cannot be determined at the level of this study. The ability to differentiate active duty from veteran would require further access to the medical record, which was not requested in the Institutional Review Board application and would require additional justification.

Further, only patient messages to providers were examined. This review takes nothing into account from the clinician's point-of-view, nor does it look at providers' messages to patients, which could have a very different take on the topic of SM. Thus, this research was limited only to the patient's use of the SM system.

Although the number of messages seemed very overwhelming when being read, there were only 1200 messages reviewed. This system is also only 30 months old.

Reviewing messages in the future, when both patients and clinical staff are well-versed and facile in the use of SM, may bring other issues to light.

Significance

Practice

Nurses as professionals are the educators of patients in every environment (ANA, 2010). Teaching patients to appropriately use SM, along with communication of health promoting ideas and disease prevention, falls squarely under the aegis of Standard 5B of nursing's Standards of Professional Practice (ANA, 2010). As a result of the outcomes of this review of secure messages in a healthcare facility, we can begin to understand patients' concerns regarding their healthcare, that some patients strongly value technology in relation to a degree of problem-solving in their daily lives, and how they use SM overall.

Patient-centeredness is a term coined long ago by Carl Rogers in 1951, though then it was referred to as "client-centered". Today the Institute of Medicine (2001) recommends it as the best care model. SM is one way to provide patient-centered care to our patients we care for. It is fast, effective, and can be utilized by both clinicians and patients day and night. It leaves a record of suggestions and becomes part of the clinical record.

Patients do use the available technology and findings from this study point to some methods of improving SM use. For example, from the standpoint of clinicians including nurses, answering secure message after secure message for medication refills does not seem to be an efficient use of the professional's time, when telephone systems and portals already exist for this process. To break the cycle of using secure messaging

as the primary portal for medication refills will require ongoing education of patients and significant others on best practices of SM, appropriate use of messaging, avenues better suited to medication refills, frequency of messaging, use of the SM system, and other concepts to organize correct use of messaging, will also begin to assist the clinical staff in efficient, as well as effective use of SM.

Another example of a problem is the nearly unintelligible format in which patients and their significant others reported fingerstick glucose results to providers. Those results could be easily misinterpreted, and could potentially lead to patient safety issues related to insulin dosing. The MyHealtheVet system needs to develop a template or other columnar format within SM for patients to enter fingerstick glucose results in a safe and efficient manner. Doing so could prevent inappropriate changes in insulin dosage based on difficult or impossible to read blood glucose results. Further, a separate area devoted solely to the reporting of these data would ease retrieval of information and keep these vital reports from being lost among many other messages. Nurses should take a key role in advocating for patient safety related to the SM program in the area of reporting of home blood glucose results, insulin dosing, and reporting of other vital signs by veterans.

Technology is ever-evolving. The VA is staying abreast of changes throughout the country by offering new modalities for patients to remain in contact with their health care team. The next advance in the ability to send secure messages, may include the actual ability to text one's healthcare team, or an SM application to be used on a smart-phone, though that has not been discussed here.

Theory

The use of the theory, Individual and Family Self-Management Theory by Ryan and Sawin (2009) guided and strengthened this study. Social facilitation, as a factor related to the process dimension in the IFSMT, assumed family/friend support which was evidenced by messages from a variety of correspondents; family members and friends. Collaboration and a degree of socialization between the clinical staff and the patients occurs on these messages as evidenced by the topic "replies to provider's inquiry" and the overwhelming number of messages conveying thanks and wishes for good holidays and wishes for happiness. Further review of the impact of secure messages on family/friends utilizing the system is important as well.

What remains unknown are the distal outcomes of the IFSMT, and that was excluded as part of study design. As noted earlier, some researchers have looked at changes in HEDIS scores, which is a somewhat longer and clearly measurable outcome. Reviews of glucose monitoring and changes in vital signs are potentials for further study based on the utilization of SM within the VA's MyHealtheVet program, the Department of Defense's Relay Health messaging system and other, similar portals.

As the IFSMT model is conceptualized as reflecting the incorporation of health-related behaviors into routine living, this theory was an excellent model for this study. The tenet has been borne out by review of the patterns of use of SM in everyday life, at all ages and in both men and women.

Also evident and strongly theory-related, is the example of SM as a manifestation of self-management. From users' apparent authenticity in their writing and their themes and topics, self-management is their goal. Though not used as the actual theoretic

framework on which this study was based, the SM system supports and displays

components of Lorig's model (1996) of self-management. Veterans deal with the

consequences of illness, keeping providers updated on need for medications, changes in

conditions, and certainly question and write ongoing commentaries to their providers.

The second component was not tested, but from the outside, the SM system appears to

assist the veterans with problem solving regarding their illnesses. Questions can be posed

at all hours of the day and on weekends. Within this healthcare system the turnaround

time from question to answer is relatively rapid. The third component of the Lorig model

of self-management suggests that partnerships should be built between patients and

providers; SM is an excellent example of relationships that exist between some of these

veterans and their providers.

As both healthcare and SM systems continue to evolve, SM can be the hand that

bridges gaps and frustrations that may result from growth and expansion. As patients

become more involved in their care, that involvement may result in more questions and

commentaries. Self-management and secure messaging may become a symbiotic

relationship.

Policy

Local policy could potentially be guided by this evaluation of SM. This local

healthcare system is invested in promotion of SM as a means of communication between

patients and clinical staff. Patient education should include modules on SM. Secure

messaging should be a component of hospital orientation for the clinical staff. The use of

SM programs should be implemented in areas outside of primary care. As evidenced in

this study, patients have many questions, comments, and concerns, and these occur on an

ongoing basis. In this day, and with an aging population, where it may be difficult to drive or find on-call transport to drive to see a provider, a quick message between veteran and clinician could relieve minds of worry or enable a patient to deal with a health issue that may have become a health risk. This could be determined through the SM system.

The use of SM throughout the healthcare continuum may be impacted if clinical staff have a greater incentive to utilize the system. As noted previously, this could take the guise of acknowledgement and publication for excellence in SM within the healthcare system, time off awards, or other perks that are developed. There may also be some resistance to the use of SM by providers, as it adds another level of care that they must provide to their patients. Appropriate time allocation and performance evaluations will need to change to address this aspect of patient care. Hospital administrators need to recognize the impact SM has on the clinical staff, shifting time and attention required for patient communication to already stretched schedules. Rewards are a way to make providers more interested in messaging. Medical record coding in the presence of a secure message is another avenue to pursue—that would be an acknowledgement of workload. And coding using correct procedure codes would add a financial incentive to SM.

In an age where technology is pushing boundaries at every corner, it is only logical that patients who utilize texting applications within their own families, will soon see it as a desirable option to send secure *text* messages to clinical staff. Security comes to bear in this arena, but in this day where people globally worry of security when using texting programs, a secure texting program may be on the technical horizon.

The study of SM on users of this healthcare facility can lend information and guidance for education of patients as VHA informatics and administration continue their work with the MHV SM program. Review of broader patient outcomes as a result of SM could be accomplished as was studied by Zhou, Kanter, Wang and Garrido (2010); these authors demonstrated improvement in HEDIS scores on four measures as a result of SM.

There is the opportunity for study findings to impact education from other departments within the hospital as the program grows and evolves. The SM program has had a somewhat limited use to date, utilized mainly by the primary care arena as well as primary care provisions within the mental health department. There is certainly potential for this program to move further into specialty clinics and early evidence can be seen as several of the messages reviewed here were directed at the clinical staff in the endocrinology clinic. However, there are significant limits of SM program use outside of the primary care, which may be due in part to the PACT (Patient Aligned Care Team) structure that fosters ongoing engagement with the patient.

This MHV SM system does require extra time of all clinical staff involved and recognition of the workload with this program should be part of employee education if they are to use it effectively. It requires attention to detail; it mandates untangling some emotions that are embedded in the messages and interpreting communications that suffer from misspelling and malapropisms. Since secure messages appear in the EHR, it is a part of the legal record. Instructions given by a clinician to the patient in a secure message are not unlike writing a prescription for a treatment or the listing of steps in a complicated procedure. Unlike a telephone call, there is clear evidence of what is said to

the patients, undoubtedly this aspect can weigh on the clinicians and their responses need to be carefully structured.

Research

The process of SM, its use, attitudes about SM, and outcomes, is an area well suited to further examination by researchers. SM is a newer technology as evidenced by the small number of studies available for review of the topic. As SM becomes a more frequently used system for communication between patients and providers, it is hoped that an increase in research will be forthcoming. In this sample, there was clear evidence that the largest technologically-adept group users were aged 50 to 65, as Ralston et al. (2009) reported yet this also expands that age range to include the next largest group of SM users: those in the 65 to 74 age range. Questions remain as to what makes this group the greatest users of SM. Interestingly, one would normally conclude that the most tech-savvy and electronically-inclined age range would be the 18 to 30 year olds. Does the availability of free time for retirees play into it this? Or is it as Ralston et al. (2008) stated: the best predictor of use of SM was for patient with the greatest overall morbidity? Morbidity and disease processes were not assessed in this study, but should be included in future research.

Given this very current rich database, additional research could be undertaken employing secondary analysis. Evaluation of the most frequent topic, medication, in terms of the number of requests for controlled substances versus renewal of routine medications could be of value, as could a review of themes by patients versus themes written by significant others. Another area of investigation could involve a review of the order of themes in terms of message significance. In other words, exploring whether

patients write the most significant issue first or last within the themes contained within

the messages would be beneficial, as such information could help alleviate healthcare

time constraints. Additional areas of inquiry could involve examining the relationship

between diagnoses and patients' messages. Further investigation   could also include a

review of number of messages, day of week, and time of day that each of several

individual users message over a period of time, such as a six month time frame.

Investigating the relationship between personal health history of those who write

messages at the extremes of time of the day, such as those who write at 11:00 p.m., or 2

a.m., or 5:30 a.m. could yield critical information for healthcare providers.

Next steps in the research process in regards to self-management could include

the utilization of findings in the area of self-management necessary for dealing with

chronic diseases. Persons suffering with multiple morbidities would add further support

to the utilization of IFSMT in secure messaging. Lorig, Sobel, Ritter, Laurent, and

Hobbs (2001) wrote that self-management emphasizes the individual's role in managing

his or her illness, assisting with medical management, providing patients and significant

others with necessary knowledge, skills, and confidence to deal with disease-related

problems and to collaborate with healthcare providers and the healthcare system. Patient

use of SM seems to be congruent with the assumptions of self-management and in

particular aligned with IFSMT. Study of SM in patients with higher incidence of

morbidity is therefore another suggestion for future research.

Another area that supports further investigation is the impact of SM on clinical

staff. Questions such as how staff manage and handle incoming messages from patients,

i.e., what number of messages is answered in the course of their work should be

reviewed.   How the clinical staff perceives the impact of SM on patient outcomes and how they utilize that to the patient's advantage is a valid query that could open more investigation. Examining messages in relation to clinician response is another area ripe for investigation, as is examining clinician responses from a medical-legal perspective. . Review of clinicians' initial queries to patients and responses to patients' secure messages in lengthy secure message threads is thought-provoking, interesting, and important to provide a complete picture of the use of SM.

An as yet unexplored area of investigation relates to the impact SM has on clinical staff. Such questions as

- What amount of time is allotted to the practice of SM for the clinical staff?

- How do staff perceive patient's expectations of them in regards to messages sent?

- How much time is spent in the course of the day on telephone calls versus SM?

- Do patients internalize or make different, preferred clinical changes based on telephone calls versus SM?

- Have the number of patient telephone calls decreased in relation to an increase in SM?

Investigating clinical staff's perceptions and expectations of SM in contrast or similarities to patients' perceptions and expectations is another potential area for future endeavor. A survey of several clinicians' to determine their responses to a set of patients' SM questions would be of interest, to determine if clinical staff read and consistently understand information in the same manner. A time study of various clinics and clinicians use SM throughout the course of a work day may yield additional insight about the utility and effectiveness of SM.

Lastly, revisiting the data from a more qualitative perspective would provide a different view of patients' experiences using SM. Many messages were quite lengthy and contained multiple themes and topics. Deconstructing these messages would add to the current limited understanding of SM use.

This study of patients in one VA facility was a limited view of patients' use of SM. This study supports the findings by Haun et al., (2014). Both of these studies reviewed SM from the patients' perspective. In the Haun et al. study, VA patients reported VA staff resistance to the use of SM. Of interest and benefit would be the perception of SM from the clinical staffs' view. It is not even known if there *is* staff resistance to SM or if the clinical staff appreciates SM. We might speculate that staff resistance to SM could be caused by several factors; interruptions to their routine not only by phone calls and door-knocking, paging and meetings, and a host of factors that would be understandable in regards to some opposition to the secure message system. The current study did not address clinical staffs' attitude toward SM, but that is an area of interest for further exploration. SM is another interruption in a busy day and requires insight and care in responding to patient and significant others' messages. As this study points out, messages must be read several times to glean what is really being said by patients or their friends or family members. SM requires time and effort by providers to assure a safe outcome for patients.

Another unintended consequence of SM for providers is anticipated turn-around-time for SM. This is already being tracked to some extent by the VA, though not addressed in this study. In this day of texting and instant messaging, consumers of all ages expect a rapid response in many venues. Included among that will be, if not already

there, a rapid response to SM. That response time should be studied from both the patients and the clinical staffs' point of view. Over the past several years we have begun employing this great technology to communicating with our providers and patients, but we have not reviewed its impact on patient care.

Conclusions

The following conclusions can be drawn based on the results of this study:

1. Veterans and their families and friends focused the content of their messages on ten topics.

2. Medication issues were the most frequent topic discussed overall irrespective of age of user.

3. Symptoms or changes in condition were the second most frequent topic, irrespective of age.

4. Men, as a group, wrote more about medications than women

5. Women wrote more about their symptoms

6. Most secure messages were written by those in the age range of 55-64, followed by those in the 65 to 74 year range.

7. The pattern of use for secure messaging occurred most frequently on Tuesdays and Thursdays between the hours of 9 a.m. and 3 p.m.

8. Women wrote secure messages most frequently on Tuesdays and Fridays, from 12 noon until 3 p.m.

9. Men wrote secure messages most frequently on Mondays, Tuesdays, and Wednesdays and from 9 a.m. until noon.

The Institute of Medicine (IOM) suggests a plan for 21st century healthcare that includes aims to improve the quality of healthcare (2001). These aims for quality include patient-centeredness. Patient-centeredness has several dimensions which incorporate the requirement for patient information, communication, education, and support, as well as involvement of family and friends. Patient-centered or client centered—the premise is the same as that which Rogers in 1951 spoke of. Many of these aims can be supported through the use of SM. This system of messaging needs to be further investigated so we can all continue to support our patients, improve their care, while utilizing SM to lead to improved patient outcomes.

Chapter Summary

The findings of this study were discussed and placed within the theoretical context. The limitations and conclusions of the study were offered. Suggestions for improvement in the SM program were set forth. Additionally, recommendations for future research were presented.

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Appendix A

Institutional Review Board Approval, VHA

Appendix B

Institutional Review Board Approval, University of WI, Milwaukee

Appendix C

Coding Instructions

1. Read the text message in Column N

2. Determine major theme of message

3.   Record the theme of message in Column J

4. Re-read the message to determine if any other themes are discovered

5. If additional themes are noted in a message, record each theme in Columns K, L,

    and column M as necessary

6. Return information to me

7. Call with any questions/comments

Appendix D

List of themes

Notes after initial review of themes:

78 themes w/overall discussion of appts, <u>not</u> incl update on consultant appt

3 BP readings

34 bs results

14 complaint of issues 12 related to symptoms

23 notes of concern

77 requests for consults

8 c/o Rx lost/late in mail

7 emoticons (1 sad below)

1 erectile dysf and 5 c/o prob w/penis or need attachm

7 frustration   6 anger   5 distress w/people or system

31 "needs" from prov

62 requests for results of tests or procedures

13 needs of "things"

16 c/o pain

2 prob w/MHV

56 questions

431 requests for Rx refill

11 req for antidepr

8 req for antihypert

10 req B block

29 req cardiac meds

43 req diab Rx/supplies - 2 further down as insulin

20 refill inhalers

19 req for ms

10 req for opiod

35 requests for oxy

12 req refill pain

10 refills for sleep

28 req statins

9 ref viagra

18 replies to provider message/question

Plus 21 responses to provider mess below!

28 reports of ED visits or hospitalizations

21 responses to provider question

Plus 18 replies to provider messages up above!

1758 issues/message themes

7 req to get appt squeezed in

69 Symptoms

> + 12 other from "c/o" area

23 Thanks

14 uncertainties

Unhappy w/MHV

87 updates on condition

41 updates on consultant appts

37 "wants" from provider/VA

uncertain who conversing with

refill Rx anticoag

report on condition

report of symptoms: nosebleed/? BP elev

refill Rx cardiac

how to f/u appt

looking for MD

refill Rx oxycodone 30+

Alphabetic Listing of All 1720 themes

4 "pleases" to be seen that day (please, please, please, please)	acetominophen not working
agreement on rx dosage/split	agrees to f/u w/PMR
3 agrees to see consultant	agrees to see consultant
2 anger at VA	agrees w/need for imaging exams
anxious for test results	anger
apology to MD	anger
Appointment clarification	anger w/staff member
3 need appt	apology
appt w/pulmonary	Appointment clarification
at outside facility	Appointment clarification
awaiting surgery	appt
awating refill	appt
awating refill: Cardiac	appt
billing issues	argumentative
blood glucose results	awaiting refill Rx cardiac meds at Walgreens
book appt now	awants info on f/u
3 bp results	awating refill: Cardiac
broken dme	believes opp of MD instruction
38 bs readings	blames optom
c/o abdominal pain	bloody gums
c/o chest pain	bs levels: increasing
c/o increasing anxiety	c/o carpal tunnel
2 c/o LBP	c/o drug testing
c/o Medication changes	c/o increasing pain

2 c/o pain	C/o receipt of broken rx products
c/o symptoms sciatica	c/o URI
can provider call in script or mail one out of state	Can pt get outside prescribed Rx at VA
cancel appt for same date	cancel appt in Another clinic
cancel Rx	cannot repair reason for visit
cardiac surgery in weeks	change cardiac Rx due to cough
2 change appt time	change in req for test
change in condition: flank pain	change to tylenol instead of allopurinol
change Rx for NSAID	2 changing cardiac meds on own
changed antidepressant	changing to outside consultant
2 check in	chest pain
check to see if prov read message	clarification
chronic pain	clarify appt date
2 clarification of appt	clarify labs and rx
clarification of labwork	complaints/threats to provider
clarify f/u appt w/specialist	complying w/plan for meds
clarifying refill rx process	concern about bladder cancer
2 complete paperwork	concern over father's condition
compliment on care rec'd	concern over injury
4 concern	concern over lab test
concern over cardiac status	concern over starting husband on too high dosage of thyroid
concern over health	concern that diab Rx led to cancer
concern over injury and lack of f/u	concern that Rx did not arrive in mail
concern over rash	concern-change in health status
concern over symptoms	concerned about lack of communication from providers
concerned about condition	concerned re: BP
concerned over husbands loss of independence	condition improving
condition day-by-day for month	confirmation of need for Rx
confession of breaking narcotic contract	confused over consult ordered
confirming appt for next day	confusion over elements to take as Rx
confusion	confusion over insurance/VA payment of diabetes Rx
confusion over fee basis paperwork	confusion over phone # and appt
confusion over mis-ordered dme - will call back	consult request: accupuncture
consult request: ? Surg	consult request: colonoscopy
2 consult request: audiology	consult request: dietician
3 consult request: cardiology	consult request: fee basis PT
5 consult request: derm	consult request: gyn
12 consult request: dme	consult request: Milw audiology

consult request: driving	consult request: neuro
2 consult request: ENT	3 consult request: ortho
7 consult request: eye clinic	consult request: outside PT clinic
3 consult request: fee basis	3 consult request: pain clinic
consult request: GI	consult request: prosthetics
consult request: hematology	consult request: sleep study
2 consult request: MH	consult request: urology for penis ring
consult request: neuro	2 continued physical discomfort
consult request: neuro	could be distressed over dx
consult request: OT	could rash be from celebrex
consult request: outside referrral	decreasing Rx as prescribed
3 consult request: PMR	2 difficulty breathing
7 consult request: podiatry	difficulty seeing prov at other VA
consult request: podiatry - Milw	discontinues that Rx
2 consult request: pulm	discussion of cost of rx
consult request: rec therapy	Discussion of symptoms
3 consult request: urology	Disgtress/Anger
continued back/neck pain	distress over consult
could come for appt	do not hesitate to refill narcs
d/c'd oxy	doesn't want to pay extra $
2 did not receive Rx in mail	5 emoticon smiley
did not refill in time	encouragement from family
difficulty cutting pills/discriminating pills	exercising
difficulty w/prosthetics/dme	exposure to pneumonia
discontinued statin on own	f/u and preceeding appt
discouragement	f/u on appointments
2 discussion of lab results	f/u on PT
discussion of other appt	family wants to change dosage of cardiac meds
discussion of test/procedure	fax labs to outside agency
disputes results of EMG	fearful
2 distressed w/consultant	finding own consultants
distressed w/VA	7 follow-up from other clinic's recommdations
does not see need for repeat lab tests	getting VA Rx filled on outside
drinking less	has unused Rx and uncertain what to do with it
emoticon smile x3	hello
erectile dysfunction	How to f/u medical care
exposed to person w/pneumonia-wants Rx	hurt neck 4 mos prior
eye pain/visual disturbance	hx of taking many narcotics
F/U of PMH	improved symptoms
f/u on meds and labs	improving condition

4 f/u on testing	increase # of Viagra pills
f/u w/PMR	increase dosage SSRI
family member notes changes in vs	increase in size of wound
fax form to outside agency	increased dose of thyroid on own
fax list of Rx	increasing tinnutis
fell and injured wrist	info on secondary VA
first checks on condition of provider	Inquiring of VA sxs
2 follow-up on missed appt	interest in LTC facility
forward copy of Rx to eye clinic	issue w/change in diabetes Rx
5 frustrated	labs to be drawn this week
frustration w/system	labwork prior to visit
had discussion w/COS office at Mad VA	leaving other doc
29 happy holidays	likes cane
has swelling LE	listing of physical complaints
hasn't received refill in mail	looking for prov input
how to f/u appt	lost/misplaced Rx
how to order batteries/hearing aid	meds d/cd
hx of bone dx	missed appt too busy
impact/cost of HC on insurance/life	missing Rx?
Improvement of ED	more tired
in ED prev day	need follow-up lab test
increase dosage pain Rx	need report on restrictions
6 increase in pain	need to complain of rx and people who put him on it
increase wt loss Rx	Needs access to Tele- program
info being sent from outside provider	needs answer now
injectable prostaglandin vs viagra	needs batteries for TENS
instructions on new muscle relaxant for MS	needs clarification of test results
interest in LTC facility	needs earlier appt than scheduled for
issues…	Needs f/u appt for increasing pain complaints
labs from outside system	needs f/u p/ED visit
labwork at CBOC	needs handicapped sticker renewed
late paying bill	needs info re: test/proc
left provider phone number to call back	needs letter to return to gym
list of current Rx	needs MRI
looking for MD	needs outside meds filled at VA
looking for Rx similar s/side effects	needs paperwork completed
2 looks to provider for guidance	needs PAT and H&P
2 made appt	needs pre-admission testing done OR at Milw VA
2 make appt	needs Rx
meals	needs Rx for yeast inf

metformin & h/a	needs Rx Viagra
missed appt too sleepy	needs to take more viagra than prescribed
monitoring vs	Needs update on rx
multiple issues: nail ridges, drinking to flush kidneys, etc	new glucose meter
need for PAT testing/appt	next appt
need results of test/procedure	no increase in wt
need to worry?	no need for particular refill
needs advice about stopping asa/warf prior to procedure	not certain if prov needs to see first
8 needs appointment	not satisfied w/dme
needs appt but time far out	not tolerating Rx from GI standpoint
needs assurance for further procedures	notice of upcoming appt
needs clarification of change of rx	old symptoms return
needs diaper for invol bm	order labs same day as appt
needs eye appt	overwhelmed w/husband's d/c to home
needs f/u from consulting clinics	pain continues: back
needs H&P for new job	pain improving
2 needs help w/form	pain in shoulders
needs increased pain medication	pain knee
needs intervention for appt at Hines VA	pain: shoulder
5 needs labwork ordered	plans for next appt
needs less expensive RX	Preparing for post-op pain outside FHCC, wants to line up Rxs
needs long acting seizure Rx	prob w/sending message to wrong provider
needs orders placed for test/procedure	problem w/dme
needs pain meds	problems w/eyeglass prescription
needs paperwork completed	pt being treated at outside assist.living facility
needs pre-admission testing done for Milw VA	pt sends SM to f/u from phone call from doc
needs refill simvastatin	quest re: antidepressants
61 needs results of tests/procedure	quest re: treatment and continued physical discomfort
needs Rx for toothache	question about lab tests
needs Rx stronger than oxy	question about test prep
needs test/procedure ordered	question date of immunizations
2 needs to make appt for f/u	question if should receive shingles vac while p/cold
needs transport to city	question need for current rx being taken
new BP rx not decreasing BP	question need to stop Rx
3 new symptom	4 question re: next step in HC plan
nf Rx	question re: completion of forms

no longer constipated	question re: condition
no relief from tramadol	question re: group sessions re: pain
not received Rx in mail	question re: memory OTC Rxs
not SOB	question re: stopping meds coumadin
Note re: heading to Emerg Dept	question re: upcoming lab work
notices symptoms	question re: vitamins
2 order blood work	question re; herbal
order labs prior to appt	question why much blood taken by lab
out of Rx	Questioning dx
2 pain	questioning meds
pain breast	questioning refill rx
2 pain continues	questions diagnosis
pain continues: neck and back	questions if should be on antibiotics
pain in neck	questions re: LFT
pain increased	questions re: next step in HC plan
2 pain increasing	questions re: treatment plan, ED
pain: LLQ	quit school
plan for OTC nutritional supplement	rash
preparation for upcoming appt	reaction to Rx
prob w/MHV	reason for not getting lab tests completed
problem getting Rx	received bill/charges for meds not happy
problem w/shipping Rx	received Rx and didn't know why
provider to complete paperwork	refill antidepressant
PT increasing need for pain Rx	refill at outside pharm
pt thinks should have synthr increased	refill choleterol med
qestion re: condition	refill opiod anagesic
quest re: test	refill parkinsons rx
question about insulin, diabetic Rx and effect on kidneys	refill Rx acetominophen
question about test prep	refill Rx ADHD amphetamine
question BPH med	refill Rx allergy med
question if cramping due to Rx	refill Rx antacid
question if VA carries rx	refill Rx antidepressant and other rx
question need for proposed colonoscopy	refill Rx antifungal
3 question of next steps in Tx	refill Rx arthritis on outside
question re: appearance of Rx	refill Rx asa
Question re: condition	refill Rx at outside agency
question re: follow-up	refill Rx bisphosphonate
question re: h/a and metformin	refill Rx cortisone cream
Question re: MHV meds	refill Rx cyanocobalamine

question re: rx	refill Rx diuretic
question re: symptom	refill Rx ear drops need flush
2 question re: testing	2 refill Rx fentanyl patch
question re: vaccine	refill Rx folic acid
question re: wound	refill Rx gabapentin - ?lost in mail
question Rx on list	2 refill Rx glaucoma
questioning cardiac meds and relates Rx to feeling weak	refill Rx H2 receptor agonist-pepcid
questioning medications	refill Rx hyperlipidemic
questioning refill rx	refill Rx immodium
questioning where and if new Rx ordered	refill Rx iron
questions if labs prior to appt	refill Rx keratolytic
questions if should go to ENT or ED	refill Rx laxative
questions/comments re: drugs and lab tests	refill Rx lomotil
quote from research	refill Rx lyrica
re: appt	refill Rx mom
rec'd call for appt to consult clinic as requested	refill Rx multivit
received different Rx than expected	refill Rx naprosen
refill all Rx	refill Rx narcotic
refill anti-inflammatory rx	refill Rx omeprazole
refill cardiac rx	31 refill Rx oxycodone
refill cough rx	11 refill Rx Pain
refill opiod analgesic	2 refill Rx PPI (prilosec)
8 refill Rx	refill Rx psyllium
refill Rx acetominophen	refill Rx rheum art(humira)
refill Rx acetominophen	refill Rx rosacea cream
7 refill Rx all	refill Rx specific statin
refill Rx amphetamine	refill Rx stool softener
8 refill Rx antibiot	7 refill Rx thyroid
9 refill Rx antidepressant	refill Rx tramadol/gaba
refill Rx anti-epileptic	refill Rx triglycerides
refill Rx antihistamine	7 refill Rx viagra
7 refill Rx antihypertensive	refill Rx viagra (levitra)
3 refill Rx antiinflamm	refill Rx w/stronger than NSAID
2 refill Rx anxiolytic	refill Rx with 1/2 dosage of current rx to obviate need to cut pill
3 refill Rx arthritis	refill Rx: incontenence items
refill Rx ASA	refilling VA Rx on outside
refill Rx atypical antipsychotic	refills not arriving
11 refill Rx B blocker	relates family health issue
refill Rx bentyl/IBS	20 reply to provider message
5 refill Rx benzodiazepam	reply to req for ret visit

refill Rx bisphosphate	reply to req from MD
4 refill Rx BPH	report of home fire
24 refill Rx cardiac	report of outside testing
2 refill Rx cardiac meds x 2	report on condition: improved
refill Rx CHF	report on emergency visit
2 refill Rx cholesterol	report on future visit PT
3 refill Rx codeine	report on new condition
3refill Rx constipation	req consult: Milw ENT
refill Rx cough med	req for overact blad rx
refill rx dementia	req for RA rx
18 refill Rx diabetes	req info on surgical notes
18 refill Rx diabetes supplies	request change in Rx post stent
refill Rx ear drops	request consult: ortho
2 refill Rx enoxaparin	2 request for appointment
refill Rx eye	request for f/u
refill Rx fentanyl patch and double dose	request for hearing aid batteries
refill Rx fleets enema	request for increased pain meds
5 refill Rx from outside provider	request for letter to be written for special equipment
8 refill Rx gabapentin	request for proof of vaccine
refill Rx gabapentin and increase	request for Viagra
4refill Rx GERD	request lab/procedure in advance of appt
2 refill Rx gerd/reflux	request letter clearing pt to work out
4 refill Rx gout	request of provider to add tests to already drawn serum
refill Rx HCTZ	request Rx nicotine patch
refill Rx ibuprophen	request strong pain killer
16 refill Rx inhaler	request to send info to outside provider
refill Rx inhalers from other provider	Request update of rec: POA
2 refill Rx insulin	requesting appt
3 refill Rx K+	requesting change in Rx to clopidogrel
refill Rx lasix	requesting lab tests
refill Rx lithium	requesting new MH provider
refill Rx lovenox	requesting rx for arthrits
2 refill Rx magnesium	requests change in med form
2 refill Rx MDD/Bipolar	requests hearing aid batteries
2 refill Rx methotrexate	requests info on change in VA policy
refill Rx migraines	requests labwork prior to next visit
11 refill Rx morphine	requests letter approving travel to Las Vegas for 92 y/o
3 refill Rx morphine x 2	requests nicotine patch
3 refill Rx muscle relaxant	requests pills be cut in half

refill Rx narcotic	requests Rx antibiotic
refill Rx NASAID	requests Rx hydrocortisone ointment
3 refill Rx nasal spray	requests rx vit d
refill Rx nicotine patches	requests to gain wt
7 refill Rx NSAID	re-request for dme
4 refill Rx ointment	response to call left on machine
10 refill Rx opiod	return of symptoms: tingling w/radiation
2 refill Rx ostomy supplies	review of insulin dose
refill Rx outside VA	review of previous test/procedure
refill Rx pain and overnight Rx to pt	requests consult: dermatology
refill Rx parkinsons	Rx lost/not filled
3 refill plavix	see consultant on specific dates
10 refill Rx sleep	sending labs in German
refill Rx prostate	sent bs readings/requests response
2 refill Rx proton pump	sent wrong Rx by pharm
refill Rx reflux/GERD	sharing info
refill Rx rheum arth	sharing treatment suggestion
refill Rx shampoo	side effects flexeril
3 refill Rx SSRI	sleep apnea
28 refill Rx statin	some concern over condition
refill Rx supplies	sore ear
refill Rx topical corticosteriod	sores on thighs
refill Rx tricyclic antidepressant	start Rx oxycodone/tram
refill Rx ulcerative colitis	stopped taking insulin
refill Rx viagra - hasn't arrived	suggest MD learn to use MHV SM
refill Rx vit	supervisor ? Need for return appt to prov
6 refill Rx vit D	8 symptoms
4 refill Rx vitamins	symptoms - headach
2 refill Rx w/stronger	symptoms arthritis
3 refill Rx warfarin	symptoms blood in stool
refill Rx zantac	symptoms h/a - migraine
refill supplies	symptoms of infection mouth
refills Ambien get stolen by USPS or VA	3 symptoms of URI
refused pain meds by VA ED previous noc	symptoms pain in hip
2 relating symptoms	symptoms when swallowing
reminding provider	symptoms worsening
2 reminding provider of procedures to be done	symptoms: flu
reply to req for ret visit	symptoms: lesion better
8 report of BP results	symptoms: pain
report of outside testing	symptoms: pain in eye
report of vs	symptoms: ringing in ear

report on change in vs	syptoms, report on Improved
13 report on condition	thankful for provider
report on condition: gall stones	thanks for time
2 report on condition: worse	thanks/ complaints
report on discussion w/outside provider	thought to be suicidal at other hospital
2 report on emergency visit	to ED w/HTN bec out of same Rx
report on emergency visit/hospitalization	took antbiotic
24 report on emergency visit/hospitalization outside system	tramadol not working well
report on new condition	transfer to Milw VA
report on parent's deteriorating condition	Treatment of h/a & scabies Diagnoses
5 report on vs	trouble refilling rx
req for OT things	trust in provider
req for PT products ordered/to be used by outside PT	uncertain of change in cardiac Rx
req for smoking cess	uncertain of consultant's recommendations for care
request audiology exams	uncertain of meds to use w/nebulizer
request consult to ortho	uncertain over Rx to take
request diclofenac even if has to pay by self	uncertain who conversing with
request for appointment	uncertainty re: diabetic meds
request for card rx	unhappy w/Va
4 request for dme	update
request for handicapped parking	update
request for HIV lab draw	update on appt w/consultant
request for info to outside provider	update on condition and worse symptoms
7 request for lab draw	update on condition improving post flu
request for letter to be written for employment	update on condition: ED visit
request for plavix from outside doc	update on condition: injection for pain
request for STD lab draw	update on condition: mixed
request if father can travel	update on condition: pain increasing
request labwork next day	update on condition: was bad, improving
request MRI on advice of oncologists	update on condition: worse then possibly improved
request rad report	update on condition: worse, falling
request Rx to quit chewing tobacco	update on condition: worse, multiple c/o
request to cut glipizide in 1/2	update on consultant appt: increase Rx
request to use gym on site at FHCC/needs approval letter	update on consultant from outside
2 requesting appt	update on life

requesting appt w/dietician	update on living situation & xfer to so VA
requesting lab results	update on symptoms: pain
requesting name of PT worked w/previously	update rx
requesting refill	update to new provider on rxs currently taken
requests CT scan	urgency
requests imaging procedure	verification
3 requests labwork	verifying lab times
requests labwork prior to next visit	verifying receipt of flu vaccine
requests NF Rx	Viagra not working
requests notes for migraines to use FMLA	wants access to gym
requests Rx acetominophen	2 wants appt
requests Rx for gut	wants dates of vaccinations
requests Rx viagra	wants flu vaccine
requests service dog	wants gym access
requests vaccine	wants handicapped sticker
responding to call from nurse	wants info from provider on suggested procedure
19 response to provider message	wants info on vaccine
return of paper Rx	wants lab results
review of current meds	wants new microwave
review of meds	wants paperwork completed
review of Rx	wants penile implant
Rx lost in mail?	wants PT outside of VA
sad emoticon	wants return call from provider
send for 3 mos	wants Rx thru VA if there's not deductible
sending message to one provider to encourage another provider to utilize SM	wants stronger pain meds
sent RN to fill outside pain Rx @ VA	wants surgery at specific hospital system
set up appt	Wants test results
sharing pulse ox leads to unwanted findings	wants to increase dose Rx
should he go ED or see MD?	wants use of gym
2 shrinking penis	went outside system to get pain rx
side effects p/viagra	what to do?
SOB	why wasn't Rx written for vitamin
soon to run out of Rx	will mail disability forms to provider
sore throat	wondering if wrong lab results delivered to pt
7 squeeze in appointment	worried about fam hx of diabetes
start vit D	worry
stopping prednisone	would be avail to be seen
suggests increasing # pills for next script	would like to quit statins

symptoms - growth	wound dry
symptoms - rectal bleeding	writes in anticipation of future visit
symptoms back pain/?clot	wrong dme ordered/received
symptoms continue	wt gain
symptoms kidney stone	2 update on condition: worse or same
symptoms of URI	update on condition: worse re: bs
symptoms of yeast inf	update on condition: worse, cramping in le
symptoms sore throat	update on condition: worse, macular degen
symptoms URI w/CHF	update on condition: worse, sore on thigh
3 symptoms UTI	25 update on consultant appt
symptoms with new Rx	18 update on consultant appt - outside system
4 symptoms, new	Update on job position
symptoms: confusion	update on life
2 symptoms: cough	Update on meds currently taken
symptoms: gout	update on outside Tx
symptoms: nosebleed/? BP elev	update on upcoming appts
symptoms: pain in ankle	Update to lab info from outside lab
symptoms: pain increases	update/appts
symptoms: tennis elbow	urging prov thru peer pressure to increase gabapentin dose
6 syptoms, report on	verifying flu shot need
takes oxycodone	verifying new Rx
17 thanks	viagra giving h/a nausea
thanks for med	vision decreasing
thanks for ur time	wants approval to take OTC
theory on government workers	wants appt
2 thinks Low T	wants assistance at home
to have surgery/procedure outside system	wants f/u on labs done
too busy to drive father this far	wants food
took self off of Rx	wants handicapped sticker
transfer all Rx to VA	wants help at home
Treatment of h/a	wants info on recent labs
treatment of scabies	wants job at Va
trouble submitting spec	wants lab test prior to appt
uncertain if needs upcoming appointment	Wants new wt loss rx
uncertain of charges for medical care p/age 65	wants penile band/ring
uncertain of f/u w/consultant	wants provider to talk to therapist
2 uncertain of lab results	wants results test/procedure
uncertain of plan of care	wants Rx amicar (antifibrinolytic)

uncertain over Rx to take	wants steriod inj knee
uncertainty re: correct BP meds	wants stronger Rx muscle relax and anti-in
unhappy w/Milw bill	wants target wt
unsure of med protocol in prep for cardiac surgery	wants test results
update	wants to walk in to derm clinic
update on accident	warning of lack of support
update on blood glucose results	went to ED for fill
24 update on condition	who should regulate diabetes?
update on condition and worse symptoms	will f/u w/consult
3 update on condition: better	wondering if labs should be done prior to appt
2 update on condition: constipated	worry
update on condition: gout or sprain hand	would like to change meds
14 update on condition: improved	would like to switch to tramadol
update on condition: itching	writes in anticipation of future visit
update on condition: not resolved	wrong diabetic supplies sent
update on condition: pain increasing	wrong medications sent
16 update on condition: worse	

Claudia S. Derman
University of Wisconsin, Milwaukee
December, 2014

<u>**Education**</u>
University of Wisconsin, Milwaukee, WI
Doctor of Philosophy in Nursing   **2014**
Dissertation: "Use of Secure Messaging by U.S. Veterans and Significant Others"

Northern Illinois University, DeKalb, IL
Master of Science, Nursing   **1988**

College of St. Teresa, Winona, MN
Bachelor of Science, Nursing

EMPLOYMENT EXPERIENCES
   Supervisor, Nursing Informatics
   James A. Lovell, FHCC
   North Chicago, IL
   2009 – present
   Responsibilities include
   Development and maintenance of EHR for the first joint VHA/DoD Federal
   Health Care Center in the country. Work with developers to assure joint accuracy
   of VHA and DoD medical records. Work with staff and administrators to ensure
   ongoing development and functionality of electronic health record. Supervise and
   teach departmental and hospital-wide staff.
   Clinical Applications Coordinator
   VAMC Iron Mountain
   Iron Mountain, Michigan
   1995 – 2009
   Responsibilities included:
   All aspects of the electronic medical record;, testing of hardware,
   software, system parameters, implementation of system and its related
   components, education of staff. Large software product implementation (record
   scanning, patient electronic signature, digitized radiology system). Design and
   writing of order sets and standing orders, documentation review, quality review
   of system. Discussion with administrators, managers and staff to improve use
   and quality of system and review of current aspects. Plan for future projects.
   Held classes for all staff on basics of computers, word processing and spread
   sheet program for beginning, intermediate and advanced levels of each course.
   Responsible not only for Iron Mountain campus but also for six community based
   clinics (e.g. Sault St. Marie, Ironwood) which require physical presence on an
   ongoing basis.

Instructor
Lake Superior State University
Escanaba, MI
2000
Taught one semester of Healthcare and Computers

Chair, Pembine, Dunbar, Beecher Rescue Squad 2003-2009
EMT, Pembine, Dunbar, Beecher Rescue Squad
1996-2009
Responsibilities included maintaining a licensed and state accredited agency of 25-35 volunteer EMTs and volunteer ambulance drivers in rural Wisconsin. Problem solving and counseling of staff. Monthly meetings, writing of policies and procedures. Maintenance of own licensure. Patient care in unknown situations. One of only two volunteer staff with professional healthcare background.

Clinical Director
Clinical Support and Development
The Glenbrook Hospital
Glenview, Illinois
1989 – 1995
Responsibilities included
Planning, implementing, and evaluation of all programs and personnel within each, as well as four cost centers and related budgeting processes, personnel and supplies) for the following areas:
Quality Management and JCAHO preparation – Department of Nursing, Patient Classification, Nursing Research and Publications. Orientation and Education of all Department of Nursing Personnel, Patient Education, Medical Library, Special Support Programs, Fetal Diagnostics, Healthwatch Program, Nursing Information Systems. Also supervision of, Nurse Practitioners, Supervisors, Center for Plastic and Aesthetic Surgery, Continuity of Care Department, Management of Nursing Office.
Clinical Coordinator
Same Day Surgery Unit
The Glenbrook Hospital
1985-1989
Responsibilities included:
Physical design and layout of unit, start-up of new unit including publicity in house and in community, growth of unit from 2 patients per day to more than 18 patients per day, all personnel related issues, greater than $2 million dollar budget, start-up of nursing component of In Vitro Fertilization Program, house-wide implementation and maintenance of Medicus Patient Classification System.
Clinical Coordinator
Orthopaedic Unit
The Glenbrook Hospital
1978-1985

Responsibilities included:
Start-up of new unit: personnel and supplies, unit growth from six to thirty six patients, greater than $1.5 million annual budget, national presentation of AHA Nursing teleconference "The Head Nurse's Role in the Budgeting Process." (Unit closed 1985, as Orthopaedics became an outpatient service.)
Staff Nurse
Orthopaedic Unit
Northwest Community Hospital
Arlington Heights, Illinois

PROFESSIONAL DATA

R.N. Licensure: Illinois, Wisconsin, Michigan,
    Current to 2014
Chair, Pembine-Dunbar-Beecher Rescue Squad 2002-2009
Emergency Medical Technician, State of Wisconsin
    Current to 2009
    Chair, Pembine-Dunbar-Beecher Rescue Squad Board of Directors

Past Vice President, Organization of Nursing Doctoral Students, University of
    Wisconsin, Milwaukee 2006
Past Secretary, Orthopaedic Nurses' Association
    Northwest (Illinois) Suburban Chapter,
Member: Chicago Metropolitan Nursing Education Organization (CMNEO)
    1989-1995