

HEALTH CARE PROVIDERS PERSPECTIVES ON SOCIAL
MEDIA IN PROFESSIONAL PRACTICE

by

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TABLE OF CONTENTS

1. INTRODUCTION	1
Background and Significance	2
The Changing Health Care Landscape	2
The Changing Health Care Consumer	5
Purpose.....	8
Conceptual/Theoretical Framework.....	9
Assumptions.....	10
Definitions.....	10
Health Care Consumer	10
Health Care Providers	10
e-Health.....	11
Smartphone	11
Health Information Technology.....	12
Social Media	12
2. REVIEW OF LITERATURE	13
Literature Search Methodology	13
Key Terms and Searches.....	14
Summary of Articles	17
Social Media	17
Health Care Delivery	19
Health Care Consumers and Social Media	20
Health Care Providers and Social Media.....	23
Pender Health Promotion Model (HPM).....	24
Gaps and Opportunities.....	26
3. METHODS	27
Population/Sample	27
Discussion of Rights of Human Subjects and Consent Process	29
Design	30
Data Collection Procedures.....	31
Instrumentation	34
Analysis.....	36
4. RESULTS	37
Qualitative Thematic Results.....	48

TABLE OF CONTENTS – CONTINUED

5. DISCUSSION.....	50
Evaluation of Results	50
Age.....	53
Provider Type.....	53
Practice Area.....	54
Study Limitations.....	54
Implications.....	55
Practice.....	55
Research Implications.....	57
Education	57
Implications for the Nursing Profession	59
Health Policy Implications.....	60
Summary	63
REFERENCES	66
APPENDICES	71
APPENDIX A: Letter of Inquiry to Solicit Endorsement of Research (NRC).....	74
APPENDIX B: Letter to IRB(s)	76
APPENDIX C: CITI Responsible Conduct of Research	78
APPENDIX D: CITI Student’s Curriculum Completion Report.....	80
APPENDIX E: Validity Checklist for Survey Instrument.....	82
APPENDIX F: Permission to Reference SurveyMonkey.....	84
APPENDIX G: Survey Instrument Hyperlink.....	86
APPENDIX H: Consent Form	88

LIST OF TABLES

Table	Page
1. Consumer Age Demographics, Online Use Percentages and Search of Health Care Information	7
2. Literature Review Key Term Search CINAHL	16
3. Social Media Types.....	18
4. Mobile Platform Used for Health 2009	21
5. Age Demographics of Target Sample.....	38
6. Chi-square Test Stats: Effects of Gender on SMT/Mobile Users.....	43
7. T-test Stats and Group Means: Effects of Age, Tenure, Provider Type, Area of Practice on Study Variables.....	46

LIST OF FIGURES

Figure	Page
1. Target Sample Demographics: Provider Type.....	39
2. Tenure of Target Sample	39
3. Area of Practice of Target Sample.....	40
4. Gender Demographic of Target Sample	40

ABSTRACT

Communication technology evolution including social media (SMT) is creating challenges and opportunities in health care delivery, the impact of which is not fully understood in the health care arena. While consumer utilization studies are ongoing, a paucity of published literature exists to study health care provider's perceptions of the significance of these changes. The purpose of this research was to quantify health care provider's familiarity, utilization of SMT, and perceptions of benefits and barriers to use in professional practice.

This was a non-experimental descriptive phenomenological study. The study population ($n=310$) included health care providers (M.D., D.O., ND, NP, PA) employed with a regional, Western health care system. This study was conducted using a concurrent, mixed-methods approach. A validated survey, developed using Pender's Health Promotion Model, was distributed to the target population by the organization's Nursing Research Council (NRC).

Response rate was 20% with an age range of 27-70 years. Gender included females (50.8%) and males (49.2%). Tenure in practice included < 5 years (16.9%), 5-10 years (15.3%), 10-20 years (30.5%), and 20 + years (37.3%). Respondents were primarily M.Ds (62.7%), followed by D.O. (1.7%), N.D. (1.7%), NPs (16.9%), and PAs (16.9%). Familiarity with the term "social media" was 95% with personal account ownership (62.7%). Utilization of SMT in practice varied by application with 78.7% indicating no current use followed by health education (13.1%), practice promotion (6.6%), scheduling and appointment reminders by text (4.9%), interactive patient communities (4.9%), and patient self-management tools (1.6%). Smartphone utilization was 98.3% with 69.5% accessing health care applications. Sixty one percent perceived benefit of SMT in improving patient care, but 53% disagreed or strongly disagreed with benefit for clinical decision-making. Predominant barriers to SMT in practice included: uncertainty of legal implications, time commitment to monitor, and patient/provider confidentiality concerns. Power-users were younger, were 4 times more likely to utilize smartphones to access health care related applications, 3.4 times more interested in SMT benefits, and 3.5 times more likely to anticipate future SMT use in practice. SMT may be most useful as a complement to traditional delivery modalities.

CHAPTER I

INTRODUCTION

The health care industry is a dynamic, ever-changing environment. Changes in communication technology are driving innovations in how care is provided and consumed. The evolution of communication technology, including social media technology (SMT), is shaping the landscape of health care delivery creating opportunities in efficiencies and consumer health benefits by “supporting shared decision-making between patients and providers, providing personalized consumer self-management tools and resources, building social support networks” (www.healthypeople.gov) for providers and consumers, and delivering accessible health information that is targeted or tailored to consumers.

While these advances hold promise, the impact of electronic communication modalities in the delivery of health care is not well understood. These mediums represent a technological transformation of social and professional communication environments and relationships, the impact of which, are yet to be fully discovered in the health care arena.

Health care reform efforts related to cost-containment and mitigating the financial burden of chronic health conditions have prompted government inquiry into the potential use of SMT and mobile health technology as viable modalities of health care delivery. Developmental initiatives are underway to create uniform standards of use, common frameworks, and supporting technology. Health policy-makers are interested in e-health

tools to improve patient's participation in personal health outcomes, reduce health care costs, improve the quality of the care experience, and to provide consumers with resources to manage their own health. Initiatives are underway to develop regulatory and legal infrastructure to support integration, and work is being done in policy development surrounding concerns with consumer confidentiality and liability protection for providers.

Increasingly, health care consumers have engaged in accessing health information via SMT, and are participating in the evolution of communication technologies.

“Conditions are favorable for a greater investment in consumer-oriented electronic health tools. Health care organizations are adopting and offering alternative communication technology, and government policy is placing great emphasis on both health information technology and personal health management for consumers” (web.health.gov). The missing component is health care provider participation and engagement in these efforts. To date, minimal research has been done to establish baseline utilization data of this integral group. Research to study the perspective of health care providers on the significance of social media in health care delivery is overdue.

Background and Significance

The Changing Health Care Landscape

The changes occurring in the interactivity between health care providers and health care consumers in relation to health care consumer access and utilization of health information technology, and the paradigm shift from traditional disease management to prevention, health promotion, and patient-centered care have influenced innovation in the

health care landscape. The 2001 Institute of Medicine report, “*Crossing the Quality Chasm*,” included patient-centered care as one of six underlying dimensions of quality care. “The implementation of patient-centered care principles relies on addressing patients’ desire for information, facilitating communication with providers, and supporting shared decision-making; actions that are increasingly supported by communication technology” (Lober & Flowers, 2011).

The Federal Government has embarked on major initiatives to increase the use of health information technology by health care providers and consumers by creating the Office of the National Coordinator for Health Information Technology (ONCHIT) within the U.S. Department of Health and Human Services (HHS) to provide a strategic platform for the federal government to exercise leadership in health policy related to health information technology (web.health.gov). The Patient Protection and Affordable Care Act of 2010 and the American Recovery and Reinvestment Act of 2009, provide direction, measurement and finance to support these efforts with the allocation of \$19 billion in federal spending to more efficiently share information and to create administrative efficiencies by upgrading health information technology. *Healthy People 2020*, (www.healthypeople.gov) developed under the leadership of a Federal Interagency Workgroup, is a collaboration among the U.S. Department of Health and Human Services (HHS) and other Federal agencies, public stakeholders, and the Secretary’s Advisory Committee on Health Promotion and Disease Prevention Objectives for 2020. Co-led by the Office of the Secretary Health Communication and Health IT, this collaboration, provides guidance toward identifying nationwide health improvement opportunities and

has included new objectives to focus on health communication strategies to improve population health outcomes and health care quality. “Enhancing the information available to consumers, making it more relevant or customized to their needs and linking this to treatment options, promises to improve the consumer’s participation in care” (Speedie & Davies, 2006). *Healthy People 2020* initiatives target consumer access to emerging technologies (e.g., cell phones, the Internet, and social media), increasing the proportion of patients whose doctor recommends personalized health information resources to help them manage their health, increasing the proportion of persons who use the Internet to communicate with their providers, and increasing the proportion of persons who use mobile health technology.

“The topic of social media in health is an intersection of two fast-evolving ecosystems: health and technology... The rapid uptake has been remarkable for a nation that has been traditionally slow to adopt Health Information Technology (HIT)” (Kahn, 2010). As an integral component of the health care system and as key stakeholders in the patient-provider relationship, health care provider’s perceptions of the value of SMT in practice is key to transformational dialogue and patient-centric integration of alternative communication techniques. “Understanding the topic of SMT relative to current utilization patterns, and the perceptions of SMT utility in health care delivery, from the perspective of the health care provider will allow for a marketplace where health care providers are proactive versus reactionary in influencing their environment as change agents” (Kahn, 2010). The exploration of social media use in health care delivery is gaining national momentum, and the strategies relative to utilization, health policy, legal

implications, reimbursement, and effectiveness are developmental requiring baseline data from health care providers to establish and achieve objectives.

Surprisingly, “despite the growing body of literature highlighting both promises and controversies of social media use in health care, there are few empirical studies involving the health care providers themselves” (McGowan, et al., 2012), and clearly, the development, adoption and utilization of these tools will be influenced by the health care provider’s perceptions of the role of SMT in the health care delivery system.

The Changing Health Care Consumer

Consumer e-health is part of the broad cultural shift toward using technology and the Internet as a normal part of everyday life (web.health.gov). “The new health care consumers are a generation ‘born digital’, those who have grown up immersed in digital technologies and for whom a life fully integrated with digital devices is the norm” (Palfrey, & Gasser, 2008). The health care provider’s understanding of the consumer’s interaction with digital media such as the Internet and mobile technology, may serve to positively influence the dynamic of the patient-provider relationship, to harness opportunities that digital fluency presents relative to self-management of health conditions, and to shape regulatory and educational frameworks in health care practices to promote health and better serve health care consumers.

Health care consumers are increasingly accessing health information online as a means of improving their understanding of health. Results of a survey, the “Social Life of Health Information,” conducted by the Pew Research Center in 2009, indicated that

...in 2000, 46% of American adults had access to the Internet, 5% of U.S. households had broadband connectivity, and 25% looked online for health information...In June of 2009, these numbers had increased with 74% going online, 57% having broadband connectivity, and 61% using online resources to access health information” (Fox & Jones, 2009).

In addition, “widespread public access to the Internet continues to demonstrate positive trends in access to information for many patients” (Lober & Flowers, 2011). “Internet use had increased from one in ten adults in 1995 to one in two by 2000, according to Pew data... By 2008, 75% of adults had used the Internet, but usage patterns were showing a shift from information-seeking to interaction” (Fox & Jones, 2009). According to the Pew Internet survey, *Health Online 2013*, “81% of U.S. adults used the Internet, 59% said they had looked online for health information in the past year, and 35% of U.S. adults said they had gone online specifically to try to figure out what medical condition they or someone else might have” (Fox & Duggan, 2013).

Eight in ten internet users look online for health information, making it the third most popular online pursuit among all those tracked by the Pew Internet Project, (2013) following email and using a search engine. Further, the study (2013) revealed that “half of internet users (48%) who go online for health information say their last search was on behalf of another person, 36% say their last search was on behalf of themselves, and 11% say it was both for themselves and someone else. Thus, while eight in ten internet users go online for health information, the impact of their inquiries may be much broader”.

Health information gathering online has been consistently popular over the last decade. The number of internet users has not dramatically increased from 2002, but access to the internet has become more commonplace. “With the exception of adults age

70 and older and those with less than a high school education, internet use has shifted from being exceptional to being commonplace” (Fox and Duggan, 2013). Table 1 provides survey results across age ranges for going online and those online who seek health information. Access to the internet is not limited to tethered applications such as desktop personal computers. More commonly, mobile device technology is creating an avenue of access to health information and cell phone ownership has increased. Fox, (2010), reported that, “85% of American adults owned a cell phone, and that while older adults were less likely than younger adults to use a mobile phone, their numbers were still robust with 58% ownership in adults over the age of 65 years”.

Table 1: Consumer Age Demographics, Online Use Percentages and Search of Health Care Information

Activity	Millennials (18-34 yr)	GenX (35- 46yr)	Younger Boomers (47-56yr)	Older Boomers (57-65yr)	Silent Gen (66-74yr)	GI Gen (75+ yrs)	All online adults (18+)
Go online	95%	86%	81%	76%	58%	30%	79%
Seek HC info	78	84	80	83	73	69	80

Source: Pew Research Center's Internet & American Life Project surveys, 2008-2010.
<http://pewinternet.org/Reports/2010/Generations-2010/Methodology/Note-on-survey-dates.aspx>

Hanson et al., (2011) maintained that obtaining accurate health information is important in order for consumers to make educated decisions regarding their personal health and that of their community. To this end, health professionals have been marginally successful in using traditional communication tools (TV, radio, print, first-generation Internet Web 1.0) to reach consumers. “Over the past 25 years, the media landscape has changed with use of traditional media such as television, radio, and the first generation Internet (Web 1.0) declining in popularity... Many consumers are now using new media channels such as the second generation Internet (Web 2.0 or social media) to

obtain health information and to communicate with other individuals” (Hanson, et al., 2011). “Health care consumers are trading passive reception of information for interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web” (Hanson, et al., 2011). “With the shift away from traditional channels of communication towards new social media channels, health providers have the potential to enhance health education practice through the integration of social media by using social media tools to mobilize communities around an issue, correct misinformation that is circulating through social media outlets, and to develop relationships with patients, making them true partners in promoting health and behavior change” (Hanson et al., 2011). Perhaps most importantly, not incorporating SMT into health care delivery may mean missed opportunities for health professionals to participate in health care dialogue.

Purpose

The purpose of this study was to understand the significance of SMT in health care delivery from the perspective of health care providers given the changing landscape of health care delivery including the paradigm shift to more patient-centered focus of care, increased consumer access and utilization of alternative health information tools and subsequent impetus for health policy change and technology integration initiatives.

Advocates point to the potential of SMT as a complement to the traditional approaches used to boost awareness of and participation in wellness, prevention, and health care management, but little has been published on health professionals’ use of SMT and even fewer studies have identified the factors that contribute to or dissuade provider’s use (Sidorov, 2010).

Research relative to health care provider's perceptions of social media's significance in health care delivery, and the impact of utilization will be influential in coordinating approaches to tool development, evaluation of effectiveness of utilization of social media in health promotion strategies, creating business models, and developing legal and regulatory guidelines relevant to SMT and the health care industry. This researcher proposed that in order to effectively integrate alternative communication technologies into health care delivery systems, research must include all stakeholders. There was a paucity of literature that captured the significance of SMT in health care delivery from the perspective of health care providers. As such, baseline data of health care provider's level of perceived self-efficacy with technology, current utilization of SMT, perception of social media's role in health care delivery, and perception of benefits and barriers to the adoption of this medium in health care practice was warranted.

Conceptual/Theoretical Framework

Recognizing motivational factors and how they influence behavior was a component of Pender's Health Promotion Model (1987) and provided a conceptual link to the theoretical framework of this research. In Pender's HPM, "cognitive and perceptual factors such as perceived self-efficacy, perceived benefits of health-promoting behavior, and perceived barriers of health-promoting behavior in combination with modifying factors such as interpersonal influences, and situational factors influence the likelihood of engaging in health-promoting behavior" (Pender, 1987). Based on the HPM, the concepts of motivation in health promotion behavior, perceived self-efficacy,

and perceived benefits and barriers of behavior were explored in this research and were utilized to develop a survey instrument to describe the phenomenon of health care provider's perceptions of the role of social media in clinical practice.

Assumptions

Three assumptions of the HPM served as theoretical underpinnings of this research question understanding that, “persons have the capacity for reflective self-awareness, including assessment of their own competencies; persons’ value growth in directions viewed as positive and attempt to achieve a personally acceptable balance between change and stability; and self-initiated reconfiguration of person-environment interactive patterns is essential to behavior change” (Alligood & Tomey, 2010, p. 441).

Definitions

Health Care Consumer: A health care consumer is “any actual or potential recipient of health care, such as a patient in a hospital, a client in a community mental health center, or a member of a prepaid health maintenance organization” (*Mosby’s Medical Dictionary*, 8th edition.

© 2009, Elsevier).

Health Care Provider: A health care provider is “a person who helps in identifying or preventing or treating illness or disability” (*Mosby’s Medical Dictionary*, 8th edition. © 2009, Elsevier).

e-Health: E-Health is “a broad term for the heterogeneous and evolving digital resources and practices that support health and health care. E-Health resources enable

consumers, patients, and informal caregivers to gather information, make healthcare decisions, communicate with healthcare providers, manage chronic disease, and engage in other health-related activities. Most, although not all, of these resources are available through the Internet. Most tools support several of these functions, generally structured around a primary purpose such as disease management” (Bauer, & Kanaan, 2006). Examples of *e-Health tools* “include online communities and support groups, online health information, online health self-management tools, online communication with health care providers, and online access to personal health records” (www.health.gov).

Smartphone: Personal devices defined as smartphones include: “cell phones or mobile phones run over wireless communication networks through radio waves or satellite transmissions... Personal Digital Assistants (PDA) phones combine cell phone, Web browsing, and organizer functions such as calendars. PDAs allow downloads of applications (apps) run on specific operating systems such as iPhone, BlackBerry, Windows Mobile, Palm, Web, Symbian and all types of Linux including Android” (Kahn, 2010).

Health Information Technology (HIT): Health information technology (HIT) is defined as “the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making” (Brailer, & Thompson, 2004).

Social Media: Social media “describes a set of technology tools that are used to mediate opportunities for bringing people together and encouraging social networking and dialogic communication” (Eckler, Worsowicz, and Rayburn, 2010, p. 1046).

CHAPTER 2

REVIEW OF LITERATURE

The purpose of the review of literature was to establish the importance of answering the following research question: From the perspective of health care providers, what is the significance of social media in health care delivery? An additional purpose was to relate this research study to the larger ongoing dialogue in the literature about the topic of the utilization of SMT in health care delivery. In addition, literature was used to develop and refine concepts of a topic that, in large part, had not been examined to better understand the concepts within this research question as they pertain to current knowledge and literature, to identify gaps in current knowledge about these concepts, and to frame effective strategies of inquiry relative to these concepts.

Literature Search Methodology

The literature review was conducted using the Montana State University Library Cumulative Index to Nursing and Allied Health Literature (CINAHL) database, and PubMed Central U.S. National Library of Medicine National Institutes of Health. The key search terms were as follows: (a) social media; (b) health care providers; (c) health care delivery; (d) Pender, and (e) health care consumer. An aggregate of current research survey results from 2009 to 2013 were reviewed from leading research foundations on Internet and social media utilization to describe the key terms (c) health care delivery, (b) health care providers and (e) health care consumers relative to social media including the

Pew Research Center in Washington, D.C., PriceWaterCoopers, Epocrates, and the Manhattan Research's Cybercitizen Health® U.S. 2012. The search for published literature was limited to articles written in English and publications with research pertaining to the U.S. Inclusion criteria were set to obtain manageable numbers of articles, and to ensure that the research was current. Each key term was searched individually, paired, and searched in combinations to obtain comprehensive review.

Key Terms and Searches

The key term, (a) social media was searched in CINAHL with and without full-text availability and publication dates from 1989 to 2012 and revealed 752 results without full-text and 266 with full-text and publication dates from 2007-2012. Further refinement to include the aforementioned criteria in U.S. academic journals yielded 118 results. Of the 118 results, 45 articles were excluded as a result of their content being specific to certain disease conditions, specific consumer populations or social conditions outside of health care provider utilization of social media. Sixteen of the 118 results were specific to marketing and private practice business models and were subsequently excluded as being outside of the scope of this research question. Nineteen of the 118 results pertained to privacy, legal issues with social media policy and specific organizational policy relative to the use of social media and were subsequently excluded. Twelve of the 118 sources pertained to utilization of social media in human resource management and recruitment in vocational searches and those were not deemed relevant to the research question. Six of the 118 sources were specific to continuing education and were subsequently excluded as well as fifteen articles on professional social networking that were not deemed relevant to

this research question. The five remaining articles were specific to this author's research question using (a) social media as the search term.

The key term, (b) health care providers searched in CINAHL with full-text limitation and to include publications from 2007-2012, yielded 1,122 results. As a result of the number of results, the search was further refined to full-text availability, abstract availability, publication dates within 2007-2012 and the search refinement combined the key terms, (b) health care providers and (a) social media. Given those refinements, zero results were found. The confines of those search requirements were deemed too restrictive and this author refined the search using key terms (a) social media or social networks and (b) health care providers using full-text availability and publication dates from 2007 to 2012. This search yielded seven results, but none were relevant to this research question.

The key term (c) health care delivery done in CINAHL with full-text limitation and publication dates 2007 to 2012 produced 2,181 results. Combinations of search terms were used to further create a manageable number of resources that had pertinence to this research question. Table 2 outlines the results of key search term combinations in CINAHL.

The key term (d) Pender refined to include full-text, and publication dates from 2007-2012, yielded 24 results, one of which was relevant to this inquiry, and the key term search (e) health care consumer yielded 11 results with full-text and publication 2007-2012 criteria with one article utilized in this research. Upon completing the search for related publications, twelve articles were selected for inclusion in the review of literature.

Table 2. *Literature Review Key Term Search CINAHL*

Key terms:

a) social media, b) health care provider, c) health care delivery, d) Pender, e) health care consumer

Search Term Combination	Results	Relevant articles
a + b	0	0
a + c	4	4
a + d	0	0
a + e	0	0
b + c	10	0
b + d	0	0
b + e	3	0
c + d	0	0
c + e	15	0
d + e	0	0
a + b + c	0	0
a + b + d	0	0
a + b + e	0	0
a	118	5
b	1,122	0
c	2,181	0
d	24	1
e	11	2
Total		12

Summary of Articles

Social Media

A systematic review of the definition of Health 2.0 and Medicine 2.0 was conducted by Van De Belt, Engelen, Berben, and Schoonhoven, (2010) that identified “46 unique definitions of social media across 44 articles of Health 2.0 and Medicine 2.0 publications.” Variations in the current literature existed in defining the term, “social media.” McGowan, et al., (2012), described social media websites and applications as, “online environments where users contribute, retrieve, and explore content primarily generated by fellow users.” Eckler et al., (2011), indicated that while there were many definitions of the term ‘social media;’ “they all involved two primary actions: socialization and sharing.” This is an important distinction in the transitional communication landscape utilizing interactive means to communicate rather than more traditional static communication mechanisms. Eckler et al., (2011) described social media as “a set of technology tools that provide mediated opportunities for bringing people together and encouraging social networking and dialogic communication.” The Eckler, et al. (2011) article also listed four types of social media use included in Table 3. Social media was defined by Ressler & Glazer, (2011), as “the constellation of Internet-based tools to help a user connect, collaborate, and communicate with others in real time enabling participation in an active, digital dialogue or conversation in contrast to a passive, digital monologue in static context.” For the purposes of this study, a combination of these definitions was used to develop survey questions pertinent to health care provider’s utilization patterns and application preferences.

Table 3: *Social Media Types (Eckler, et al., 2011)*

Type	Description	Examples	Examples in Health Care
Blogs	Online journals, where authors share their opinions and/or experiences on various topics. Blogs can be personal, similar to an online diary, or professional, with opinions related to an area of expertise. Entries vary in length (often 200- 1000 words) and frequency (some bloggers post daily or a few times a day, whereas others post 2-3 times/week), and readers can comment on posts. Entries can include photos and audio/video files.	Blogger; http://www.blogger.com LiveJournal; http://www.livejournal.com WordPress; http://www.wordpress.org	Sharing Mayo Clinic; http://www.sharing.mayoclinic.org American Red Cross; http://www.blog.redcross.org/ Mercy Health System; http://www.mercyblogs.org/ McLeod Health; http://blog.mcleodhealth.org/
Microblogging and presence applications	A version of the blog. Twitter limits length to 140 characters, and many users post several times a day. Posts can be sent via cell phone or text messaging, and can include images.	Twitter; http://www.twitter.com Tumblr; http://www.tumblr.com FourSquare; www.foursquare.com	St. Jude on Twitter; http://www.twitter.com/StJude/ Aurora Health on Twitter; http://www.twitter.com/Aurora_Health
Social networking sites	Web sites on which users build online profiles, share updates about themselves, photos, links, etc, and comment on others' updates. A key function is the linking to other profiles, which builds one's social network on a site.	Facebook; http://www.facebook.com/ MySpace; http://www.myspace.com/ LinkedIn; http://www.linkedin.com/	Phyzforum; http://www.phyzforum.org Veterans Health Administration on Facebook; http://www.facebook.com/VeteransHealth
Photo/video/file sharing sites	Web sites on which users share photos/videos/files. Uploads are searchable and often can be downloaded and spread by linking to them in the other 3 types of social media. This linking could increase the reach of a video/photo exponentially and make it go "viral."	YouTube; http://www.youtube.com/ Flickr; http://www.flickr.com/ SlideShare; http://www.slideshare.net/	Wellmont Health System on YouTube; http://www.youtube.com/user/WellmontHealth Duke University Medical Center on YouTube; http://www.youtube.com/user/dukemedicine

Health Care Delivery

Authors described a transition in the way that health care is being delivered in terms of technology as a key driver in the health care environment, and changes in health

care consumer's behavioral trends in accessing health care information via social media networks and digital and mobile technology applications. As reimbursement models transition to bundling and patient-centered medical home models of care become increasingly prevalent, there may be greater incentive for providers and patients to partner in leveraging SMT and digital mobile technology as a complement to traditional health care delivery. Horrigan, (2009) suggested that, "mobile health monitoring could help payers, both public and private, to reduce costs related to chronic diseases and improve patients' quality of life by monetizing mobile health services by offering mobile health care monitoring products, services, and solutions to care delivery organizations." Advocates proposed benefits of SMT and mobile device technology including improvements in workflow, productivity, and opportunities for increased revenue and job satisfaction for health care providers. Notably there was a paucity of literature confirming these benefits from the perspective of the health care providers.

Clearly, the proliferation of information and communications technology in the past three decades has influenced the health care environment, but to date, authors suggested that there is a lack of understanding of the impact of these technologies in the health care industry such that social media and mobile technology applications have not been consistently adapted to drive reorganization and reform of health care delivery. Information is more widely and freely available to consumers having a profound impact on issues of cost, efficacy, quality, and access (O'Neil, 2011). "Medical information has become more broadly and transparently available, leveling the patient-provider playing field as data increasingly moves to an open access model, and with this vast data overload

and increasing information access, the idea that accurate and meaningful information can only flow in one direction, from a provider to a patient, is also evolving” (Timimi, (2012).

Health Care Consumers and Social Media

According to Eckler et al., (2010), social media comprise the largest share of Internet users’ time and have demonstrated increasing utilization trends with 74% of all Internet users in the U.S. visiting social networking or blogging sites. Predominantly people aged 35 to 44 were using the 19 most popular social networking sites representing one-fourth of the total users (2010). Many consumers are using social media, providing impetus for exploration of whether, and to what extent, social media may influence health care delivery.

“The majority of consumers of online health information access user-generated health information because it provides tailored information or ‘real-time, someone-like-me’ information (Fox & Jones, 2009), challenging health professionals to think differently about how to communicate with patients.” Further, Thackeray & Neiger, (2009) suggest that “communication has shifted from unidirectional to multidirectional as consumers use more social media to create, seek, and share information... Unidirectional refers to the traditional top-down communication process where senders, typically professionals, relay messages through communication channels such as print media to a receiver.”

Kahn, (2010) reported increasing trends in the use of smartphone and digital mobile technology among health care consumers and providers with “two-thirds of

physicians using smartphones in 2009, 80% of Americans owning a cell phone, a PDA phone, or a smartphone in 2009, and one-third of people using a cell phone or smartphone to access the Internet.” The number of mobile Internet users increased 74% between 2007 and 2009. Mobile device use increased access to the Internet regardless of socioeconomic status or race as well according to results of the *Wireless Internet Use* survey, Pew Internet & American Life Project, July 2009, demonstrating that Americans accessing the Internet by tethered or cell phone means included 91% White, 87% African American, and 94% Hispanic. Kahn, (2010) also reported that, “as of February 2010, there were 5,805 health, medical, and fitness applications within the Apple AppStore with 73% intended for use by consumers and 27% targeted to health care providers.”

Table 4, below, illustrates mobile health platforms.

Table 4: Mobile Platforms Used for Health, 2009

Mobile Device	Health Examples
Activity Detector	Wellcore Activity Monitor
Cell phone	TellMe Networks-text message reminders for medication adherence (Microsoft)
Messaging platform	FrontlineSMSMedic-private two-way network using open source software and cell phones
Motion sensor	FitBit, Nintendo Wii
Pager	ALRT Technologies’ Constant Health Companion-prescription alert device
PDA	MEDLINE Database on Tap, NLM Mobile, LabNotes
Mobile Personal Emergency Response System	MobiWatch M-PERS
Senior Phone	Jitterbug
SmartPhone	iPhone health apps-sensors for diagnostics, such as glucose monitoring
Medical-specific platforms	Implantable diagnostics-including patient vitals monitor, smart pills, wearable diagnostics, wireless pillbox

Adapted from “TripleTree LLC,” *Wireless & Mobile Health*, 2009

According to a PriceWaterhouseCoopers survey (2009), “about one-half of U.S. health consumers were willing to participate in online care and consultation with providers over the phone. Only one-quarter preferred the traditional delivery model.” Results of the Epocrates 4th Annual Future Physicians of America survey, (2009), indicated that, “most Americans are now turning to the Internet to seek health information, and at least 50% would like to email a physician to communicate about conditions, appointments, prescriptions, and test results.”

Health Care Providers and Social Media

Cybercitizen Health® U.S. is Manhattan Research’s annual market research study and syndicated advisory service benchmarking how U.S. consumers use the Internet, digital media, mobile devices and other technologies for health (manhattanresearch.com). The Pew Research Foundation studies Internet use by health care consumers. The Pew Research survey results from, *Health Online 2013*, represented a nationwide survey of 3,014 adults living in the United States (PewInternet.org). They described trends in consumer utilization of social media as well as current research trends of health care provider’s utilization of mobile technology and Smartphones or other mobile device technology.

According to trends reported by Manhattan Research’s Cybercitizen Health® U.S. (2012) study, 74% of physician assistants said they used smartphones during patient consultations. Smartphone use by RNs at the point of care was 67% and 60% among advanced practice RNs. Medical doctors reported less use at 40% of patient consultations. The report, *Taking the Pulse: Nurses 2012*, was based on a survey of 1,019 U.S.

practicing nurses and physician assistants conducted during the second quarter of 2012, as well as a survey of 3,105 U.S. practicing physicians conducted during 2012.

The objective of the McGowen, et al., (2012) study was to identify how physicians used SMT to share and exchange medical information with other physicians, and to identify factors that influenced physicians' use of SMT as a component of their learning and continuing professional development. They studied 485 physicians using a survey instrument based on the Technology Acceptance Model to hypothesize that technology usage was best predicted by physician's attitudes toward technology, perceptions about usefulness, and individual factors such as personal innovativeness. Results indicated that, 57.5% of the physicians studied perceived SMT to be beneficial in accessing high-quality health information, that 57.9% of the physician respondents thought that SMT enhanced effective patient care and that 60% stated that SMT improved quality of care. In the study, "the main factors influencing use of SMT to share medical knowledge were ease of use and usefulness; respondents with positive attitudes toward SMT were more likely to engage in utilization; and neither age or gender had a significant impact on adoption or use of SMT" (McGowen et al., 2012). A limitation of the study was that the sample was entirely physician providers limiting generalizability of findings to a broader spectrum of health care providers. Primarily the variables studied in McGowan et al., involved the utilization of SMT in provider networking applications and in continuing education, but were not specific to broader applications of engagement between patients and providers in health care delivery. They recommended research with a broader population of providers across a broader set of variables including: self-efficacy

with technology utilization, perceived benefits and barriers to use of SMT in clinical practice, and willingness to incorporate SMT into health care delivery applications.

Pender Health Promotion Model (HPM)

Srof and Velsor-Friedrich (2006) provided a review of Pender's Health Promotion Model in *Nursing Science Quarterly*, 19(4), 366-373. The health promotion model (HPM), originally developed in the early 1980s by Pender, is a framework that serves as "a guide for exploration of the complex biopsychosocial processes that motivate individuals to engage in health behaviors directed toward the enhancement of health" (Pender, Murdaugh, & Parsons, 2002).

Pender's Health Promotion Model (HPM), provided four thematic constructs of interest that were used in the survey question development of this research relative to the perceptions of health providers of the role of using social media in clinical practice. These were perceived self-efficacy, perceived benefits of action (utilization), perceived barriers to action (utilization), and commitment to a plan of action. Definitions of these constructs were as follows from M.R. Alligood and A. Tomey (Pender personal interview, May 6, 2004):

- Perceived self-efficacy: "The judgment of personal capability to organize and execute a behavior. Perceived self-efficacy influences perceived barriers to action" (p.438).
- Perceived barriers to action: "anticipated, imagined, or real blocks and personal cost of undertaking a given behavior" (p. 438).

- Perceived benefits of action: “anticipated positive outcomes that will result from given behavior” (p.438).
- Commitment to a plan of action: “The concept of intention and identification of a strategy that leads to implementation of a behavior” (p.438).

Srof and Velsor’s (2006) integrative review of literature was important in that it demonstrated ways in which behavioral change could be guided by the HPM, and supported that appropriate theoretical models are necessary for the continued development of nursing knowledge related to health promotion and human behavior relative to changes in the health care landscape. Research investigating health care provider’s perspectives of the significance of social media in health care delivery was limited, and the study of that phenomenon utilizing a nursing theoretical framework was not located in published literature.

Gaps and Opportunities

The growing adoption of social networking in other sectors of society suggests significant numbers of health consumers may utilize social media tools for their health care (Sidorov, 2010). This literature review indicated that while the prevalence of SMT use among health care consumers has risen, there is limited research to document utilization patterns or perception of the utility of social media in health care delivery from the perspective of the health care providers. Martinasek et al., (2011) opined that the use of social media technologies is prolific in the U.S. Social media encompasses innovations that move non-interactive and individual Internet use toward technology with the capacity for dynamic interaction among users, including social networking sites. Clearly,

opportunities exist to take advantage of health promotion and health education opportunities using SMT. The objective of this literature review was to develop an understanding of the concepts within this research question as they pertained to current knowledge and literature, to identify gaps in current knowledge about these concepts, and to frame effective strategies of inquiry relative to these concepts. This author identified gaps in the literature relative to health provider perceptions of social media utilization in clinical practice. Studying the perceived benefits and barriers to SMT use in health care delivery from the perspective of health care providers was supported by the paucity of findings on this topic in the published literature.

CHAPTER 3

METHODS

The purpose of this study was to explore and quantify utilization, preferences, and perceptions of the benefits and barriers of SMT among health care providers. This discussion of methodology in the next section will include the study design, the population of study, the data collection instrumentation and procedures, the timeframe of the study, a discussion of the rights of human subjects in the research, and the processes of statistical analysis of the findings.

Population/Sample

This study was conducted using convenience sampling with the following inclusion criteria: health care providers with the following educational criteria: physicians, either medical doctor (M.D.), doctor of osteopathy (D.O.), or naturopathic doctors (ND), nurse practitioners (NP), and physician assistants (PAs) employed or contracted with a regional, integrated health care system, based in a Western state. The health care system setting, a not-for-profit, multi-specialty group practice, served the local community as well as residents of the primary Western state and three other Western states. This health system had 240 physicians and 70 physician assistants and nurse practitioners in their employ, and was one of the largest employers in this western region (excluding state and federal government). The organization's service area comprised 40 counties, an area of 121,000 square miles and a population of 572,000. This

health system was chosen as a result of the regional reach of the health care provider's services with more than 149,000 individual patient visits in the system's primary and specialty care clinics, and more than 888,000 patient care encounters in 2010 (<http://www.billingsclinic.com>).

The organization's mission and vision supported the pursuit of new nursing and medical knowledge with research and education benefitting current and future patients. The organization-wide commitment to higher education among nurses as well as its broad service area for patient services created potential for broad generalizability of research findings.

To guide the recruitment protocol and establish sample size adequacy in determining confidence in results significance, an *a priori* power analysis was conducted using G*Power software (version 3.1.3) with an alpha error probability of .05 and power of 0.8. Using Cohen's effect size conventions (0.1 =small effect size, 0.3 =medium effect size and 0.5 = large effect size) and assuming a medium effect size of 0.3, it was determined that a sample of 82 with critical $t = 1.99$ was indicated (Faul, 2007). Using a large effect size of 0.5, an alpha error probability of .05, and a power of .9, the sample size required was 34 with critical $t = 2.03$. A target sample of between 34 and 82 was desired to avoid null findings from a type 2 error.

Norwood (2010) discussed that the "expected response rate to surveys is about 30%" (p. 235), and while expected participation and attrition rates do not independently affect sample size requirements, this researcher was mindful that both attrition and participation may determine how many subjects would need to be approached in

soliciting participation. Based on the target sample calculation size of 82 determined by the power analysis, and an expected response of 30%, the total sample population of 310 health care providers was desired to achieve the recruitment target.

Discussion of Rights of Human Subjects and Consent Process

This researcher completed the Collaborative Institutional Training Initiative (CITI) student curriculum to participate in research with human subjects and the Responsible Conduct of Research (<https://www.citiprogram.org>) as required by the Montana State University. (See Appendices C and D). This study involved human subjects and was reviewed and considered for approval by the Institutional Review Boards of Montana State University and the Institutional Review Board of Billings, MT. Federal law (Title 45 CFR 46.116(d)) permitted the IRB(s) to waive the requirement of written prospective informed consent under the conditions that the research posed no more than minimal risk to subjects, there were no adverse effects as a result of the waiver or alteration, and without the waiver of written consent, the research could not be carried out. (See Appendix B: Letter to IRB). All research involving human subjects must be registered with the Institutional Review Board (<http://www.montana.edu>). Some research in which there is essentially no risk to subjects is exempt from the requirement that research proposals be reviewed by the full committee. An application for request for exemption was completed and submitted for review by the IRB Chairs to insure that the research fell within the exemption guidelines.

This research met the criteria for exemption as it was research involving a survey procedure that did not deal with sensitive material, matters affecting respondent's employability or matters which could lead to criminal or civil litigation. There were no identifiers that linked participants to the research or to research data in any aspect of the collection, compilation, analysis, or reporting of findings. Survey participation implied voluntary consent and completion was anonymous, and the principal investigator did not have direct contact with participants. Letters from the MSU IRB (September 7, 2012) and the IRB of Billings (Sept 10, 2012) were received.

Design

This study was conducted using a concurrent, mixed-methods approach. Creswell (2003) defined this as, "the use of one data collection phase during which both qualitative and quantitative data are collected simultaneously" (p. 218). Qualitative research, defined by Norwood (2010), is "research that is characterized by the systematic collection and inductive/thematic analysis of narrative data as well as naturalistic and flexible, rather than controlled conditions" (p.485). Quantitative research is defined by Norwood (2010), as "research that is characterized by the systematic collection and statistical analysis of numerical data, and relatively controlled study conditions" (p.485). The mixed-method concurrent model in this study was valuable as a way to better understand the perceptions of the study group by converging numeric trends to quantify utilization and the detail of qualitative research themes discovered with the participant's response to questions regarding their perceptions of social media.

This was a non-experimental, descriptive, cross-sectional, phenomenological design (qualitative) using a survey instrument to identify and quantify (quantitative) characteristics of health providers relative to the use of social media and their perceptions of the role of social media in their health care delivery practices. According to Norwood, (2010), “non-experimental research design is appropriate in situations where the purpose of the study is to describe a situation rather than demonstrate causality between variables” (p.205). “A descriptive study is univariate in nature where there is no identifiable independent or dependent variables...the researcher may examine several variables separately as a characteristic of the larger phenomenon of interest” (Norwood, 2010). The phenomenological approach was valuable to this research because it allowed the researcher to identify patterns in the motivation and willingness to participate in utilization of social media; to evaluate what applications were considered useful from the participant’s perspectives; to understand participant’s views relative to capacity for utilization; and to identify potential barriers to utilization.

Data Collection Procedures

This researcher sought guidance from the nursing research council (NRC) of the sponsoring organization regarding appropriate strategies to solicit participation from their employees and determined that a communication alert, endorsed by physician administrative leadership, would be emailed to the population sample prior to survey distribution to announce the study, discuss the goals of the research consistent with the organization’s mission and vision, and invite health care providers to participate in the

survey as an opportunity to explore health care provider's utilization and perceptions of social media applications as a complement to traditional health care delivery.

A research proposal was presented to the NRC on March 21, 2012 and a letter of endorsement was drafted and signed by the NRC Chairperson (Appendix A). The research study was registered with and approved by the IRB of Montana State University (primary IRB) and the IRB of Billings. The members of the research advisory committee were selected and approved by the Associate Dean for Research and Graduate Education at the MSU College of Nursing on April 25, 2012. This committee was composed of a chairperson, and two additional members; one research-active faculty at MSU and one nurse scientist from the sponsoring organization.

Requirements for conducting nursing research within the sponsoring organization were met in accordance with the guidelines established for nursing research application through the NRC of the sponsoring organization. The completion of the above requirements in addition to creating a final, validated version of the survey instrument occurred over a six-month time frame from March 2012 to September of 2012. Data collection commenced in October of 2012.

Data were collected using the appended survey instrument (Appendix G). To test validity, the draft survey instrument was administered to the research advisory committee as well as members of the sponsoring organization's NRC prior to survey distribution. The selected groups were asked to consider the comprehensiveness and relevance of the survey instrument items in measuring the phenomenon of health care provider's perception of the role of social media in clinical practice (Appendix E) and were asked to

identify areas of the instrument that required clarification in wording or response instruction, and to assess the length of time it would take to complete the survey.

The criteria for inclusion for participation in the research was provided to a representative of the sponsoring organization's NRC, and was distributed via internal organizational email to eligible participants. The email included the informed consent (Appendix H), and as required, this included a brief description of the study, the purpose of the study, who would benefit from the information obtained, why the participating site was selected, the nature of the content of the instrument, estimation of time commitment for survey completion, the proposed duration of the research study, protection of participant's privacy and voluntary consent or opt-out option, and how the data would be reported. The email subject line referenced a social media survey and an online hyperlink to the survey instrument through SurveyMonkey software (Appendix F) was included for easy access within the email. A pin code was appended to the anonymous survey link as the "custom value field for each email address" for the purpose of tracking and managing survey completion for reminder messaging only, and to restrict each participant to one survey submission. Email and IP addresses were not attached to responses and no personally identifiable information was collected.

Data collection began October 31, 2012 and ended November 31, 2012 with a single email reminder at two weeks from the initial distribution. Duration of data collection timeframe was extended from the original two weeks to the one month timeframe to attempt to meet sample adequacy criteria established by the power analysis.

Summary of findings and data analysis occurred during December, 2012 and February, 2013.

Instrumentation

The survey instrument was utilized to quantify the findings of the phenomenon of health care provider's perception of social media thereby determining values and relations of constructs of Pender's HPM. In developing the survey instrument, this researcher utilized conceptual definitions of the variables or constructs as described in the definitions section and literature review of this research, and selected the draft formatting of survey questions and the instrument utilizing SurveyMonkey survey development software.

While benefits existed in utilizing established survey tools such as saving time with the development and pilot testing new instruments, disadvantages were also inherent. To use an existing tool, "a researcher must agree with the constructs and the conceptual framework on which the instrument is based" (Norwood, 2010, p. 281). Also, existing tools may lack relevance to the current research question. "Because reliability and validity is always sample-and-situation specific, instrument quality is transferable only when the instrument is used with individuals and for purposes similar to those for which it was originally developed" (Norwood, 2010, p.281).

Based on the literature review, instruments designed to ascertain social media utilization characteristics of health care consumers existed, but instruments to assess health care provider's perceptions of the role of social media in health care delivery were

limited and were proprietary. Subsequently, research was conducted with a newly developed survey tool designed to measure specified theoretical constructs specific to the study population.

The survey instrument (Appendix G) had 20 items assessing the constructs of interest and consisted of three sections of questions. Section 1 (Q 1-7) of the survey instrument was developed with items to quantify utilization of SMT and mobile device technology, assess level of familiarity with social media, and to ascertain application preferences for social media tools and mobile health technology. Section 2 (Q8-15) was designed to describe provider's perceptions of the social media role in clinical practice relative to Pender's HPM theoretical constructs of perceived self-efficacy, perceived benefits and perceived barriers to action, and commitment to a plan of action. Section 3 (Q16-20) determined demographic characteristics of participants including age, education, type of practice, years of practice, and gender.

Survey questions included contingency questions to avoid asking questions of participants that did not apply to them, and "skip logic" was also applied to avoid this phenomenon based on answers to previous questions. Other question types included matrix questions, closed-ended questions using Likert scaled and dichotomous items, and open-ended questions where no predefined categories were suggested. The survey introduction page included the name of the principal investigator, the purpose of the research, the length of the survey and estimated time required to complete it, and a discussion of consent, voluntary participation and privacy protection of participants (Appendix H).

Analysis

As this was a mixed-methods study, analysis of the data was done utilizing quantitative statistical analysis and qualitative data analysis. The analysis of data was dependent upon the data type resulting from the type of questions posed in the survey instrument. Multiple choice items, dichotomous items, and forced-choice items yielded nominal-level data (Norwood, 2010, p. 276). Rating scales provided respondents with a continuum of response options yielding ordinal-level data (Norwood, 2010, p. 276). Likert scale items were also used to achieve interval-level data. The descriptive statistics that were utilized to analyze data included frequency distributions, measures of central tendency, and measures of variability. Nominal-and ordinal-level data were tallied and provided grouped frequency distribution by class intervals. The frequency distributions were important in determining the implication for subsequent statistical procedures including crosstabulation analysis, independent sample t-testing and ANOVA analysis. Distribution measures that were appropriate for this analysis included frequency by valid percentages. Central tendency analysis was achieved using the means of variables. The measurement of variability in interval data was reported in the standard deviation from the mean. The survey instrument also had open-ended survey items that were analyzed using qualitative methods which involved establishing categorical patterns and searching for themes in the free-text responses. Using an interpretive phenomenologic approach, data was coded relative to patterns that emerged that were congruent with Pender's theoretical constructs of perceived self-efficacy, perceived benefits of action, perceived barriers of action and commitment to a plan of action. Using the SurveyMonkey

software, data were exported to the Statistical Package for the Social Sciences (SPSS v 21.0) for quantitative analysis. An alpha level, ($p < .05$) was used to determine statistical significance of results.

CHAPTER 4

RESULTS

The survey instrument was administered to 310 health care providers. This researcher received 62 responses resulting in a response rate of 20%. Two respondents did not complete the survey, however, and a sample of 60 with the following characteristics was analyzed: the age range of participants was 27-70 years, gender female ($n = 30, 50.8\%$) and male ($n = 29, 49.2\%$), tenure in practice; less than 5 years ($n = 10, 16.9\%$), 5 to 10 years ($n = 9, 15.3\%$), 10 to 20 years ($n = 18, 30.5\%$), 20 plus years ($n = 22, 37.3\%$). Respondents were primarily physician providers ($n = 37, 62.7\%$), and also included a D.O. ($n = 1, 1.7\%$), N.D. ($n = 1, 1.7\%$), NPs ($n = 10, 16.9\%$) and PAs ($n = 10, 16.9\%$). There was a mixed demographic of types of practice as follows: specialty practitioners ($n = 29, 49.2\%$), internal medicine ($n = 10, 16.9\%$), general practice/family practitioners ($n = 8, 13.6\%$), OB/GYN ($n = 5, 8.5\%$), and pediatrics ($n = 5, 8.5\%$). See Table 5 and Figures 1–4 below for participant demographics.

Table 5: *Age demographic of target sample (N=56)*

Age range	Number of Sample	Percentage of Sample (%)
0-20	0	0
21-35	10	17
36-45	14	25
46-55	18	32
56-65	12	21
65+	1	1
Uncategorized	1	1

Figure 1 *Target Sample Demographics: Type of health care provider (N=59)*

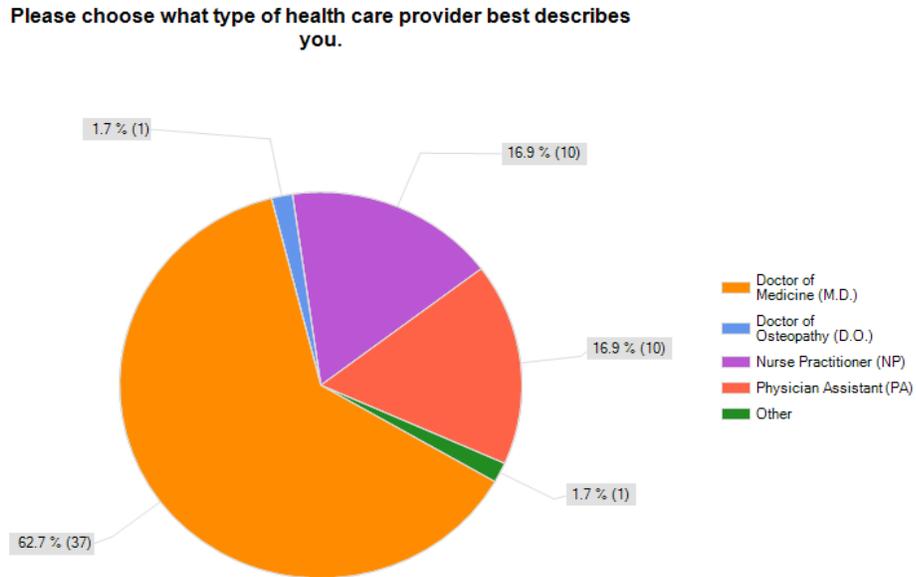


Figure 2: *Tenure of Target Sample (N=59)*

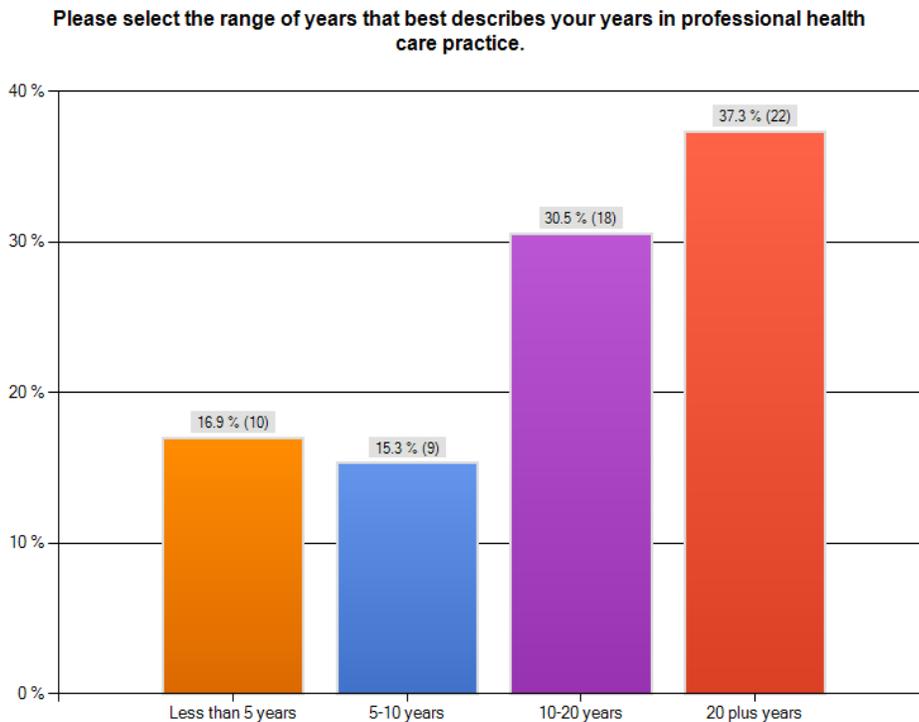


Figure 3: *Area of Practice Target Sample (N=59)*

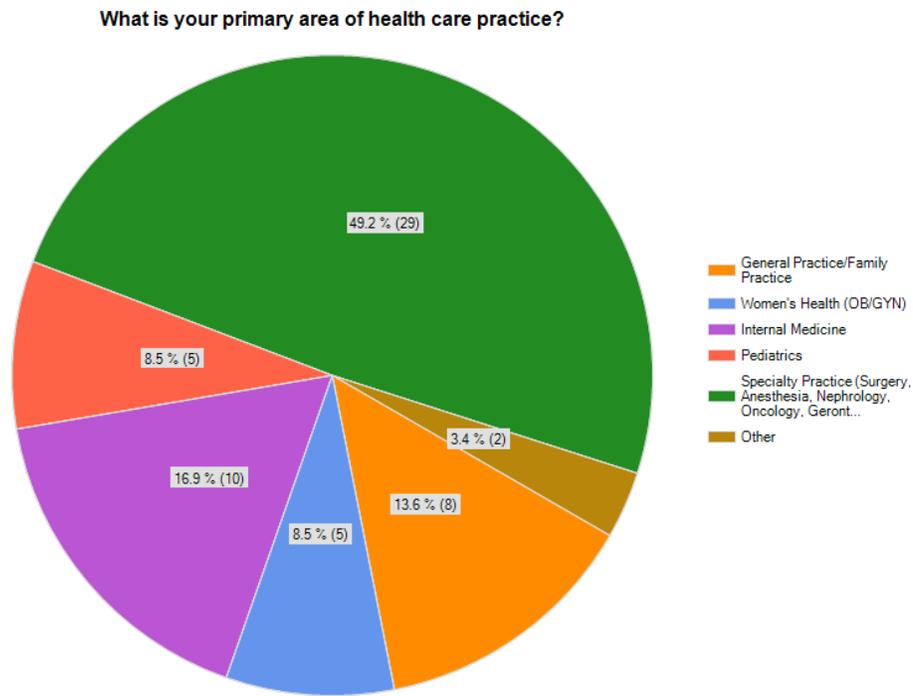
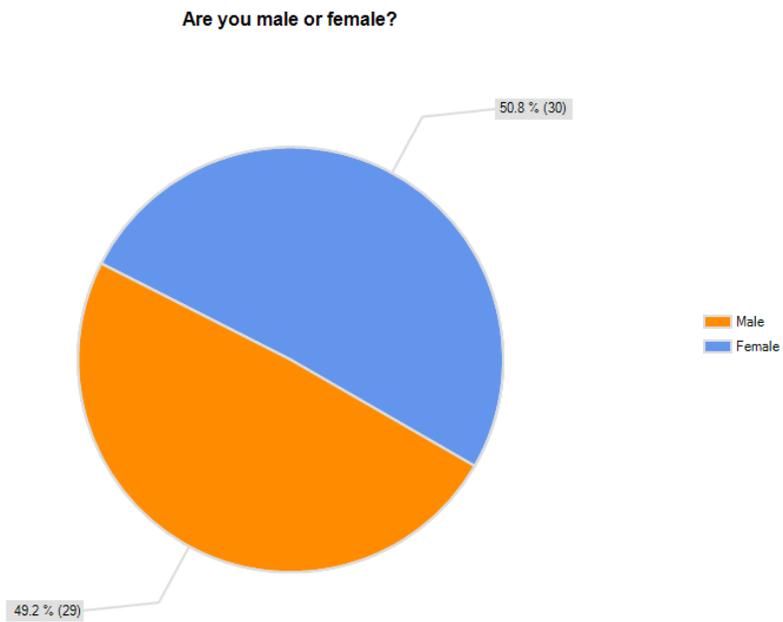


Figure 4: *Gender Demographic of Target Sample (N=59)*



Respondents ($n = 57$, 95%) reported familiarity with the term “social media.” Most respondents indicated ownership of a personal social media account ($n = 37$, 62.7%). Overwhelmingly, respondents who indicated ownership of a personal social media account showed a preference for Facebook ($n = 34$, 95.1%). LinkedIn ($n = 1$, 1.6%) or a combination of LinkedIn and Facebook ($n = 2$, 3.3%) were also reported. Current utilization of SMT in clinical practice varied by application. Of those respondents reporting current use in professional practice, 8 of 61 (13.1%) used SMT for health education purposes, 4 of 61 (6.6%) utilized SMT for professional practice service promotion, 3 of 61 (4.9%), reported utilizing SMT for scheduling and appointment reminders by text or for interactive patient communities, 1 of 61 (1.6%) reported utilizing SMT to engage patients in self-management of illness, and 48 of 61 (78.7%) reported no current use of SMT in their professional practice. The utilization of Smartphone or mobile device technology was highly prevalent with 58 of 59 (98.3%) respondents reporting use of this technology and 41 of 59 (69.5%) reporting the use of Smartphone or mobile device technology to access health care related applications.

Participants rated their comfort level with technology on a 3-point scale as “highly comfortable” (32 of 59, 54.24%), “moderately comfortable” (24 of 59, 40.7%), and 3 of 59 (5.08%) responded that they were “minimally comfortable” with technology. The exploration of perceived benefit of SMT in clinical practice was measured relative to participant’s responses to the questions “Utilization of social media in professional practice may improve patient care,” and “Social media use in health care delivery may facilitate clinical decision making.” Participants ranked their agreement on a 5-point scale

for each statement. In response to the benefit of SMT relative to improving patient care, 36 of 59 (61%) of respondents agreed ($n = 33$, 54.1%) or strongly agreed ($n = 3$, 4.9%), and 23 of 59 (39%) disagreed ($n = 16$, 26.2%) or strongly disagreed ($n = 7$, 11.5%) with that statement. Relative to the benefit of SMT in health care delivery for clinical decision making, 28 of 59 (47%) agreed ($n = 27$, 44.3%) or strongly agreed ($n = 1$, 1.6%) and 31 of 59 (53%) disagreed ($n = 24$, 39.3%) or strongly disagreed ($n = 7$, 11.5%).

Participants were asked to rank order seven barriers to adoption and utilization of SMT in clinical practice; with 1 representing *the barrier with the most perceived significance* and 7 representing *the barrier with the least perceived significance*. Scores were reported in the full range for each item. Twenty one of 54 (38.9%) respondents ranked “the lack of understanding of SMT” as the barrier with the least significance ($n = 54$, $m = 5.35$, $sd = 1.84$), followed by “uncertainty of reimbursement for clinical services provided via SMT” ($n = 59$, $m = 4.71$, $sd = 1.91$), “lack of interest in SMT in clinical practice” ($n = 54$, $m = 4.57$, $sd = 1.58$), and “concern about patient’s lack of access and ability to use technology” ($n = 53$, $m = 4.52$, $sd = 1.55$). The barriers identified by respondents as being the key obstacles to adoption of SMT in clinical practice included “uncertainty of legal implications” ($n = 49$, $m = 2.91$, $sd = 1.51$), “time commitment to monitor SMT” ($n = 47$, $m = 2.65$, $sd = 1.79$), and the barrier that represented the most perceived significance was, “patient and provider confidentiality concerns” ($n = 45$, $m = 2.28$, $sd = 1.39$).

A crosstabs analysis was performed to analyze bivariate relationships between gender and other variables of interest including familiarity with the term SMT, ownership

of personal SMT accounts, utilization of smart phone technology and accessing health care related applications via smart phones or mobile device technology, interest in learning more about potential benefits of SMT applications in professional practice, and foreseeing participation in SMT as a complement to traditional health care delivery. No gender-based differences were found. See Table 6 for chi-square statistics.

Table 6: *Chi-square test statistics: effects of gender on SMT/mobile device usership*

Gender M/F	X^2	df	n	p
Variable studied				
Familiar w term social media	2.95	1	58	.09
Ownership of SMT account	1.41	1	57	.24
Ownership of mobile device (SmartPhone)	.92	1	57	.34
Use of SmartPhone for Health care apps	2.08	1	57	.15
Interest in SMT benefits	1.04	1	58	.31
Foresee future use of SMT in practice	.59	1	58	.44

* $p < .05$ significance

In the independent samples t-testing analysis, gender had no significant effect on equality of means for most of the variables studied with one exception. Men identified the ‘time commitment to monitor SMT sites’, ($m = 2.21$, $sd = 1.53$) as a more significant barrier to SMT use in professional practice than females ($m = 3.23$, $sd = 1.95$), $t_{(44)} = -1.98$, $p = .05$. The females identified the ‘concern about a patient’s lack of access and ability to use technology’, ($m = 3.89$, $sd = 1.69$) as a more significant barrier to SMT in professional practice than males, ($m = 5.29$, $sd = .99$), $t_{(50)} = 3.56$, $p = .001$). Recall that a

lower number indicated the respondent regarded the item as a higher-ranking barrier to the use of SMT in professional practice.

Frequency of personal social media use was dichotomized to distinguish between more frequent users, '(i.e., power-users)', and less frequent users, '(i.e., novice users)'. Power users, defined as those who utilized SMT moderately often (1-2 times weekly), very often (more than twice weekly), or extremely often (daily) represented 26 of 59 (44.1%) respondents. Novice users, defined as those who utilized SMT slightly often (2 or more times per month) or not at all often (one time or less monthly), represented 33 of 59 (56%) respondents. A crosstabs analysis was performed to compare the power user group and the novice user groups on ownership of smartphone or other mobile devices, utilization of mobile devices to access health care related applications, utilization preferences of applications of SMT in professional practice, interest in learning more about the benefits of SMT in professional practice, and future participation in SMT in their professional practice. Power-users and novice-users differed on their likelihood to utilize smartphone or mobile device technology to access health care related applications. Power-users were 4.05 times more likely to utilize smartphones for the purpose of accessing health care related applications than novice users ($X^2_{(1,59)} = 5.02$, $p = .02$, $OR = 4.05$, 95% CI [1.14, 14.42]). Power users were also 3.36 times more interested in learning more about the potential benefits of utilizing SMT in professional practice than the novice users ($X^2_{(1,58)} = 4.5$, $p = .03$, $OR = 3.36$, 95% CI[1.07, 10.56]). Power users were 3.49 times more likely to anticipate future participation in SMT in their professional practice than novice users ($X^2_{(1,58)} = 5.03$, $p = .02$, $OR = 3.49$, 95% CI[1.14, 10.62]).

There was no significant difference in the ownership of smartphones between the power-user and novice-user groups ($X^2_{(1,59)} = .80, p = .37$). Only one comparison was significantly different between the groups in utilization preferences of SMT applications in professional practice. The power user group was 11.8 times more likely to indicate a preference for using SMT in clinical practice for health education purposes ($X^2_{(1,59)} = 7.08$, Fisher's Exact $p = .017$, $OR = 11.8$, 95% CI[1.34, 103.3]) than novice users.

An independent samples t-test was performed to compare power-and novice-users on perceived barriers to implementing SMT in professional practice. The only significant finding was that novice users ($m = 4.0, sd = 1.7$) reported provider "lack of interest in social media applications in clinical practice" as a more significant obstacle than the power-users ($m = 5.22, sd = 1.04$), $t_{(51)} = 3.02, p = .004$. The lower number corresponded to respondent's perception of a higher-ranking barrier to use of SMT in professional practice. A one-way ANOVA demonstrated variance between power users and novice users in the perceived barrier "time commitment to monitor SMT sites" ($F_{(25,15)} = 2.71, p = .02$), as well.

An independent-samples t-test was conducted to compare equality of means relative to participant's age on familiarity with the term social media, account ownership, frequency of use (e.g., power-users versus novice-users), and perceptions of barriers to SMT use in professional practice. The mean age differed significantly for familiarity with the term social media (yes, no) ($t_{(51)} = -2.06, p = .04$) with younger respondents ($m = 46.48, sd = 10.9$) more familiar than older respondents ($m = 59.67, sd = 7.57$). Power users ($m = 43.52, sd = 11.63$) were significantly younger than novice users ($m = 49.6, sd$

= 9.8), ($t_{(50)} = -2.05$, $p = .045$). T-tests were not significant in the analysis of account ownership but the results suggested that account owners ($m = 45.48$, $sd = 12.2$) tended to be younger than respondents who did not own accounts ($m = 50.2$, $sd = 9.02$), ($t_{(50)} = -1.52$, $p = .13$). See Table 7 for a summary of the t-test statistics and group means.

Table 7: *T-test statistics and group means: effects of age, type of provider, area of practice on variables listed*

	<i>m</i>	<i>sd</i>	<i>t</i>	<i>df</i>	Sig (2-tailed) <i>p</i>
Familiarity w/ SMT term					
Age	46.48	10.9	-2.06	51	.04
**Type	1.85	1.23	-1.11	54	.27
***Area	3.85	1.43	3.01	54	.004
SMT account ownership					
Age	45.48	12.13	-1.52	50	.136
Type	2.0	1.27	.89	53	.38
Area	3.91	1.4	1.25	53	.22
Frequency of Use of SMT					
Age: Power Users	43.52	11.63	-2.05	50	.045
Novice Users	49.62	9.8	-2.01	42.97	.05
Type	2.21	1.28	1.58	53	.12
Area	4.00	1.38	1.34	53	.185

* $p < .05$ significance **Type of provider (MD,DO,ND,PA,NP), ***Area(Specialty,OB/GYN,Peds,IM,GEN/Fam)

A one-way ANOVA was used to test for differences among provider type (MD, DO, ND, NP, PA) on utilization of SMT, frequency of use of SMT, perceived self-efficacy with use of technology, and perceived benefits and barriers to use of SMT.

“Concern about patient’s lack of access and ability to use technology” differed by provider type ($F_{(2,47)} = 7.2, p = .002$). Bonferroni post-hoc comparisons, demonstrated a significant mean difference between nurse practitioner’s (NP) level of concern ($m = 3.12, sd = 1.73$) compared to M.D.s ($m = 5.06, sd = 1.28$). Recall that a lower number indicated the respondent regarded the item as a higher-ranking barrier to the use of SMT in professional practice.

A one-way ANOVA was performed to test for differences by tenure (e.g., years in practice) on utilization of SMT, frequency of use of SMT, perceived self-efficacy with the use of technology, and perceived benefits and barriers to use of SMT in clinical practice. Significant differences were found for “self-rated comfort level with technology”, ($F_{(3,54)} = 3.47, p = .02$) and uncertainty about legal implications of health care delivery via SMT ($F_{(3,45)} = 3.23, p = .03$). Post hoc analyses using the Bonferroni criterion for significance indicated that those with less than 5 years tenure in practice, rated themselves as being significantly more comfortable with technology ($m = 1.00, sd = 0$) than those with 10-20 years ($m = 1.67, sd = 0.68$), and those with 20 plus years ($m = 1.62, sd = 0.59$). Those with 10-20 years of practice ($m = 3.47, sd = 1.55$) were significantly less concerned about the legal implications of health care delivery via SMT than those with 5-10 years of practice ($m = 1.50, sd = 0.84$). To summarize, those newer to practice perceived the technology as less of a barrier but the legal implications as more of a barrier than those with more years of practice experience.

A one-way ANOVA was performed to test for differences by practice area (specialty practices, OB/GYN, IM, General/Family, Pediatrics) on utilization of SMT,

frequency of use of SMT, perceived self-efficacy with use of technology, and perceived benefits and barriers to use of SMT. Uncertainty about reimbursement for clinical services provided via SMT ($F_{(4,51)} = 2.94, p = .03$) was the only analysis that differed significantly by practice area. Post hoc analyses using the Bonferroni criterion for significance indicated that General/Family practice providers ($m = 3.5, sd = 2.2$) identified reimbursement as a more significant barrier to using SMT in professional practice than providers in Pediatrics ($m = 6.6, sd = 0.89$).

Qualitative Thematic Results

Participants were asked the open-ended questions, “In your opinion, what is the role of social media technology in clinical practice?” There were 28 responses that were analyzed and thematically categorized into patient education ($n = 4, 14\%$), no role or inappropriate ($n = 8, 29\%$), uncertainty with a new frontier ($n = 5, 18\%$), CME and professional networking ($n = 4, 14\%$), patient follow-up and self-management motivation ($n = 1, 4\%$), and practice promotion and patient recruitment ($n = 6, 21\%$). One participant who answered “none,” went on to say,

...patients should be able to schedule appointments, pay bills, and even ask nurses questions via an online format, but to interact with a patient, establishing a patient-provider relationship without being able to make eye-contact and shake their hand would markedly decrease our effectiveness as doctors.

One response discussed a role for SMT in patient follow-up stating, “Social media consultation may reduce the need for an office visit, unnecessary travel, and could be

used to check on homebound or infirm patients.” Practice promotion and patient recruitment was also a popular role for SMT in practice based on participant’s responses.

Participants were asked to respond to an additional open-ended question to further evaluate potential perceived barriers that were not represented in the survey instrument:

“In your opinion, are there additional barriers to use of social media technology in clinical practice that are not listed in Question 9?” There were 16 responses to this question with the majority of free-text responses being simply, “No” ($n = 10$, 63%). Two respondents (12.5%) reported “time” as a significant barrier. Patient access and capability to use the technology was represented in two (12.5%) responses, and one (6%) reported “risk of patient misinterpretation” as a barrier. One of the respondents stated, “Clinicians are trained to care for patient hands-on, not on a computer.” One (6%) discussed, “drawing boundaries between interactions with patients on social media sites...SM sites should primarily be utilized for patient education, announcements for upcoming activities, and answering generalized patient questions.”

CHAPTER V

DISCUSSION

Evaluation of Results

Respondents reported a high level of familiarity with the term “social media” (95%), such that a lack of familiarity did not influence utilization or adoption of SMT. Over half of the sample (62.7%) indicated personal ownership of a social media account, with an overwhelming preference toward the social networking site, Facebook. This indicated some level of satisfaction with building and linking profiles and cultivating relationships using SMT in personal interactions. This interest in cultivation of social relationships did not extend into SMT utilization in health care delivery with only 31% of respondents reporting current utilization of SMT in practice. Respondents reported SMT use in professional practice primarily for health education applications followed by practice promotion tools. These findings suggest that the current utilization of SMT in health care is unidirectional with limited interactivity with patients. Only 1.6% of respondents reported current utilization of SMT in practice to engage patients in self-management tools.

While familiarity with SMT (95%) and personal account ownership (62.7%) were relatively high, there was prolific ownership of Smartphone or mobile device technology (98.3%). Well over half of mobile device owners also reported utilization of the device to access health care related applications (69.5%), indicating that Smartphone and digital

mobile technology may be an exciting vehicle to broaden the scope of applications in health care delivery.

This research question was studied using Pender's HPM as the theoretical framework with perceived self-efficacy, perceived benefits and perceived barriers being studied to explore health care provider's perception of the role of SMT in health care delivery. Perceived self-efficacy with technology was reportedly high overall with 94.9% reporting moderate to high levels of comfort with the use of technology. Perceived benefit of SMT in health care delivery was measured in terms of whether health care providers perceived SMT as a communication modality to improve patient care and whether SMT facilitated clinical decision-making. Over half of the respondents (61%) reported perceived benefit relative to the utility of SMT to improve patient care, but over half (51%) disagreed or strongly disagreed with the usefulness of SMT to facilitate clinical decision-making. This may indicate that providers remain uncertain about the benefit of SMT utilization in the accuracy of diagnoses and exam findings in a virtual environment.

Responses in the thematic analysis echoed the quantitative findings and suggested that the traditional, hands-on diagnostic component to a patient encounter continues to be the preferred method of clinical decision-making. Some providers may perceive consumer use of social media as threatening to the traditional patient-provider relationship, or that their influence in the patient-provider relationship is being usurped by social media. Fox & Jones, (2009), found that while "six in ten U.S. adults gather health information online, doctors, nurses, and other health professionals continue to be

the first resources for most people with health concerns, especially among people living with chronic conditions. The findings in this study reflect a perceived benefit variance between the utility of SMT in improving patient care versus the value of SMT in making clinical decisions may point to the next steps for SMT. Interventions using SMT to support patients' need for engagement as a complement or follow-up to the face-to-face encounter may be the best application at this time. This approach could complement traditional approaches with providers as the primary catalysts for accurate health information while making the delivery system more patient-centric.

Lack of understanding of SMT was reported to be the least significant perceived barrier to adoption of SMT in clinical practice. Providers identified three perceived barriers as the most significant: 1) the uncertainty with legal implications of SMT use in clinical practice, 2) the time commitment to monitor SMT sites in practice, and 3) concerns with patient and provider privacy. Male respondents identifying the time commitment to monitor SMT sites as a more significant barrier than female respondents, and women were more concerned with patient's lack of access and ability to use technology than men.

Frequency of use of personal SMT was analyzed at a granular level to determine if there was a group effect influencing use in health care delivery between high frequency users, termed power-users, and low frequency users, termed novice users. Power users, those who used SMT 1 to 2 times weekly up to daily use, represented 44% of respondents. Novice users, those who use SMT 1-2 times per month, represented 56%. Power users were 4 times more likely to utilize Smartphone or digital mobile technology

to access health care related applications. They were 4 times more likely to be interested in discovery of the benefits of SMT in practice, and were 3.5 times more likely to foresee themselves utilizing SMT in clinical practice. These findings suggest that frequency of use of personal SMT may have significant correlation with intent and willingness to utilize SMT in clinical practice. Results indicated that the power user group would be more amenable to further education and resources for the development of SMT applications and integration into practice. Among power users, health education applications were the preferred means of patient engagement in clinical practice. Novice users reported “lack of interest and time commitment to monitor sites” as more significant barriers to SMT integration than did the power users.

Results were also analyzed by the demographic characteristics of the sample to evaluate variance in utilization of SMT, familiarity with technology, perceived self-efficacy, and perceived benefit and barriers to SMT integration into practice.

Age

Younger respondents were significantly more familiar with SMT and power users were significantly younger than novice users. Although t-tests were not significant in the analysis of SMT account ownership, results indicated that account owners were younger than those who did not own personal SMT accounts.

Provider Type

Nurse practitioners were significantly more concerned with patient access and ability to use technology than physician providers. Those providers with less than 5 years

of practice experience rated themselves as being significantly more comfortable with technology than counterparts with more years of experience, but were significantly more wary of legal liability with SMT utilization in health care delivery.

Practice Area

Differences identified between providers in different practice areas indicated that those in General/Family practice identified reimbursement for SMT services as being a more significant barrier to integration than did those in Pediatrics. General and Family practice providers treat a diverse age range of patients. Perhaps this finding indicates that General and Family practice providers perceive reimbursement changes to have more broad financial implications in their practice as a result of health care reform legislation that proposes increased health insurance coverage, representing increased demand for services, and potential for decreased Medicare reimbursement.

Study Limitations

Data for this research were collected using an online survey instrument. Surveys were distributed via email to 310 health professionals. Online surveys have strengths that include global reach, speed and ease of use, and low cost, but also have limitations such as perception of junk mail, concerns about sampling procedure, lack of clarity with answering instruction and low response rate (Hanson et al., 2010). With this method of data collection, there was potential for participant bias relative to comfort level with technology and accessing a survey instrument online and while the time for survey completion was estimated at only 5-10 minutes, some of the population may have

determined that they did not have time to participate. The study was conducted using convenience sampling. It was conducted in one medical center, in one Western state in the U.S. While the target sample met criteria for determining confidence with results as evidenced by the *a priori* power analysis, the small sample size and single health care network limit generalizability.

Consumer population survey statistics used to provide background and significance in this study were largely representative of more populated areas of the U.S. Studies of less populated states relative to consumer use of SMT and mobile health technologies may be warranted to evaluate the effects of rurality on disparities of access to wireless Internet and the social media influences on the health care landscape.

A systematic review of the definition of Health 2.0 and Medicine 2.0 was conducted by Van De Belt, Engelen, Berben, and Schoonhoven, (2010) which identified “46 unique definitions of social media across 44 articles of Health 2.0 and Medicine 2.0 publications.” Variations in the current literature existed in defining the term, “social media.” While there are broad definitions of the term, social media, it was the best terminology to describe the phenomenon of interest in this study.

Implications

Practice

Based on the results of this study, the primary perceived barriers to the integration of SMT as a complement to traditional methods of health care delivery included “uncertainty of legal implications” ($n = 49, m = 2.91, sd = 1.51$), “time commitment to

monitor SMT” ($n = 47, m = 2.65, sd = 1.79$), and the barrier that represented the most perceived significance was, “patient and provider confidentiality concerns” ($n = 45, m = 2.28, sd = 1.39$). Future research should examine the lived experience of SMT integration into clinical care to explore how these concerns are mitigated in practices that are currently utilizing the technology. The evaluation of narrative responses relative to additional perceived barriers to SMT utilization revealed concern with establishing professional and personal boundaries with the use of this medium. The perception of lack of information privacy with the use of SMT was reflected in both the quantitative analysis and the thematic analysis.

The majority of respondents indicated that there was, indeed, a role for SMT integration into practice as a complement to traditional methods of health care delivery. This was application specific with health education, practice and service promotion and patient recruitment, and patient support communities being the applications that had the most perceived benefit as a gateway to other applications. The study results indicated that respondents who were frequent users of SMT in their personal lives were significantly more apt to engage in utilization of SMT in health care delivery. This would be a group of users to target to facilitate adoption of pilot SMT tools in practice. Importantly, those who were personal SMT account owners were not as likely to access health related applications as those who owned Smartphones. Mobile communication technologies in health care delivery are perhaps the most promising catalyst for adoption of SMT applications.

Research Implications

There is a need to study the “lived experience” of SMT health care programs to understand more about the benefits and barriers that are being experienced, and how those obstacles are overcome in clinical practice. Also, research relative to the consumer experience with SMT health care applications would help provide insight into consumer perceptions of the benefits and barriers to SMT in consuming health care. Research efforts to measure effects of evolving communication technology on population health outcomes, health care quality, practice efficiencies, and cost-containment are critical to SMT integration into practice. Practice-based projects need a strong evaluation component, and a broad communication and dissemination plan to influence changes in practice patterns based on evidence to support advocates projections of benefits (improved practice efficiencies, improved patient outcomes, and cost-containment).

Education

This research indicates that while familiarity with SMT and perceived self-efficacy did not negatively influence providers, providers may be largely uninformed about the consumer’s frequency of use, access, and levels of aptitude with SMT in seeking health information. The literature review indicated that the prevalence of SMT use among the health care consumer population continues to grow. Literature regarding consumer access to social media technologies demonstrated that some access disparities do exist in terms of socioeconomic status and education level, but surveys of consumer populations with diverse demographics including age, gender, ethnicity, and socioeconomic status demonstrated that access to the Internet through mobile device

connection may be bridging the access gaps. Fox, (2010) reported that, “young people, Latinos, and African Americans are increasingly likely to use mobile devices to gather information, which could potentially shift the patterns among those groups when it comes to using health information resources and that 57% of adults in the U.S. go online using a mobile connection, such as a laptop with wireless access or a smartphone.” Educational efforts regarding consumer access and utilization may benefit health care providers in changing perceptions of barriers to SMT use in health care delivery.

One perceived barrier of significance was lack of time to monitor the social media programs. Experience suggests that health care providers rely heavily on evidence to support change in practice patterns. If there is evidence of current “live” applications of SMT use in clinical practice that demonstrate time efficiencies and ease of use, in addition to improved patient satisfaction and outcomes, this may provide convincing evidence to support adoption of SMT in clinical practice environments.

Study results also provided implications for academia. Younger respondents were significantly more familiar with SMT, and power users were significantly younger than the novice users. Power users reported significantly higher levels of interest in SMT benefits in clinical practice and were more apt to foresee future participation in SMT as a complement to traditional health care delivery. Those providers who were new to practice (less than 5 years) also reported significantly higher comfort level with technology use. These findings suggest that if, indeed, there are benefits to be realized with SMT integration into practice, education curriculums in nursing and medical programs must

continue to incorporate technology to support facility of alternative communication modalities in health care delivery.

Implications for the Nursing Profession

With more than 3 million members, the nursing profession is the largest segment of the nation's health care workforce. Working on the front lines of patient care, nurses will play a vital role in helping realize the objectives set forth in the 2010 Affordable Care Act, and in achieving goals of initiatives to develop patient-centered models of care. The sheer power in numbers combined with nurses' unique approach to holistic care creates opportunity for nurses to be change agents in redesigning health care. The approach to nursing practice and the nursing profession's body of knowledge includes fundamentals of holistic patient care and consumer advocacy in combination with physiologic and diagnostic findings of illness. The prolific consumer use of SMT to access health related information suggests that there is an unmet social need component of the patient-provider relationship in traditional delivery modalities. This creates opportunity for nurses to explore definitions of patient-centeredness from the perspective of patients and to advocate for a convergence of social science and physical science in supporting patient-centered care based on patient experience.

Patients must be at the forefront of health care reform initiatives that include objectives of patient-centric health care delivery. The desired transformation in health care delivery cannot be achieved without patients, as the key stakeholders, in defining patient-centeredness. Consumers are sending a message with their use of SMT relative to health care that must be heard and heeded to create true partnership in participatory

health care. Nurses are well suited to bridge the communication gap because their approach to care spans the breadth of human needs including social, functional, spiritual, psychological and physiological components to care. As recommended in the IOM/RJWF report, (2008) there must be expanded opportunities for nurses to lead collaborative improvement efforts through research on models of care and innovative solutions, including technology that will contribute to improved health care delivery. Health care systems could support nursing leadership in developing and adopting innovative, patient-centered care models by engaging nurses to lead collaborative task forces that include consumers to work with developers and manufacturers in the design, development, implementation, and evaluation of medical and health devices and health information technology products.

Health Policy Implications

Brailer and Thompson, (2004), discussed four main goals of the Office of the National Coordinator for Health Information Technology (ONCHIT) to transform health care delivery into a consumer-centric environment and improve health care including interconnecting clinicians, informing clinical practice, personalizing care and improving population health. In their report, *The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care, Framework for Strategic Action* (2004), they discussed that to accomplish the goals of improving care and making health care delivery more efficient, efforts must be made to provide complete and useful patient information and knowledge to clinicians in real time, and in a manner linked to selection and ordering of tests or therapies for patients. They maintained that

information technology could enable this approach to clinical decision making by interconnecting clinicians allowing for portability of information for consumers between points of care which required interoperable infrastructure to help clinicians get access to critical health care information when their clinical and/or treatment decisions are being made (library.corporate-ir.net).

Moreover, to create a consumer-centric health care environment to support consumer management of their own health, communication technology must be able to support interactive, personalized care platforms to focus care delivery around consumers resulting in care that is more consumer responsive. Brailer and Thompson (2004) purported that communication technology may be a viable means to connect provider and patient community information silos to eliminate fragmentation and create consistent data flow between providers.

Ideas about health and behaviors are being shaped by the communication, information, and technology that are part of daily lives. Current literature projects that communication technology will continue to rapidly evolve in the coming decade creating challenges in monitoring and assessing the impact of these new media, including social media and mobile health technology. (healthypeople.gov). Facilitating efforts of health providers and health care consumers in adaptation to the changes in the health care delivery environment will not be a simple task. Capturing the scope and impact of these changes and the role of health communication and SMT, specifically in facilitating them will require investment by providers and consumers (healthypeople.gov). Efforts to create a social foundation to focus on prevention and wellness rather than illness management,

and fundamental changes in reimbursement to incentivize a shift in focus toward prevention and health maintenance will be paramount in sustaining progress in new health communication modalities (Lober & Flowers, 2011). According to Mathews (2009), some insurers are beginning to pay for virtual patient encounters, including Aetna, Inc; Cigna Corp; and select BCBS payers in Florida, Hawaii, and North Carolina. WellPoint, Inc., and Humana, Inc. are beginning coverage in select areas of the country with plans for expanded coverage. This is a start, but is not consistent throughout the nation. Technology infrastructure that ensures privacy and portability of health information will be necessary to encourage SMT adoption. Legal implications relative to establishing provider-patient relationships using SMT or mobile device technologies must be explored and terms of provider liability must be determined to promote a less litigious environment to encourage provider utilization. Literature review indicated that barriers to adoption are being investigated, but there are no assurances of provider protection from malpractice claims based on patient misinterpretation of SMT communications, and reimbursement for virtual encounters is not commonplace. Subsequently, these barriers dissuade use of innovative communication technologies in clinical practice and must be resolved.

Limitations exist in the lack of coordinated approaches to SMT development in health care applications as well as in the lack of objective measurement of the proposed benefits such as improved efficiencies, improved patient outcomes, improved patient satisfaction, and cost containment. To assess the impact of SMT and mobile device technology, and to fully realize benefits of SMT and mobile health applications in the

delivery of health care, concerted efforts to measure the proposed benefits and to evaluate barriers in systems that are actively utilizing these tools will need to be more broadly understood.

Summary

Results of this study indicated that the health care providers in this sample were interested in learning more about the role of SMT in health care delivery. The SMT applications in practice within this network were largely limited to health education, service promotion, and patient recruitment although there was interest in interactive applications such as patient support communities and patient self-management tools. This study indicated promise in the utilization of SMT as a complement to traditional health care delivery. Changes in the health care landscape that will accompany health care reform legislation including broader insurance coverage and reimbursement changes will create impetus for innovation and resourcefulness in the way that care is delivered. The evolution of communication technologies including SMT and mobile device technology provide vehicles to drive innovation, but the impact of use is not adequately understood.

Health care providers have opportunity to engage proactively in coordinated strategies to develop evidence-based e-health tools that are appropriate in clinical practice to achieve transformation directives. With their unique skill set and body of knowledge, in addition to being the largest sector of providers, nurses are poised to lead transformation efforts utilizing alternative communication technologies to create patient-centered delivery models.

Dissemination of these results through publication, and discussion with leaders of the sponsoring health network could facilitate dialogue about this topic and may provide direction for continuing education to support awareness of the potential benefits of SMT and mobile device technology in clinical practice. Results of this study indicate that the appropriate group to lead these efforts would be providers who have personal social media accounts, and demonstrate frequency of use. Those providers who utilize Smartphone technology to access health related applications would also be key contacts who may have ideas about consumer groups who would have interest in participating in demonstration projects. Network administrators may be interested in study results to facilitate this dialogue. Clearly, innovative communication technologies hold promise in health care delivery but discussion of these results would also involve further exploration of current SMT utilization in practice to evaluate how barriers to use, particularly time commitment, legal liability, consumer access disparities, confidentiality of health information, and reimbursement for services have been mitigated. Objective measurement of cost/benefit relative to time spent with SMT encounters versus face-face encounters and reimbursement differences would be useful to better understand the value of SMT in practice.

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APPENDICES

APPENDIX A

LETTER OF INQUIRY TO SOLICIT ENDORSEMENT
OF PROPOSED RESEARCH (NRC)

To: Nursing Research Council Members
 From: LaNora Dixon, BSN, MHA
 Graduate student
 Master of Nursing Degree
 Montana State University

Subject: Montana State University Thesis Research Inquiry

As part of the Montana State University Master of Nursing degree program, the graduate student, LaNora Dixon, is required to complete either a thesis or professional project.

A research advisory committee comprised of a tenured or tenure-track chairperson and two other research active faculty of the Montana State University College of Nursing is required. This oversight committee will evaluate and approve the project proposal each semester in order to evaluate and approve the final written report and formal presentation. A representative of a sponsoring organization is also necessary.

The graduate student, LaNora Dixon, is requesting your permission to conduct this research study exploring health care provider's perception of the role of social media in clinical practice. Your endorsement is necessary to pursue proposal presentation to the Institutional Review Board(s).

The research will be conducted in compliance with the organization's mission, vision, and organizational goals. The study proposal will go through the Institutional Review Board (IRB) of Montana State University as well as the IRB of Billings.

Currently, the researcher is in the early stages of development of the research proposal which includes conducting a complete literature review, and establishing the significance of the information to be gleaned from the research to ensure that the design and methods of the study provide means necessary to obtain worthwhile information. The graduate student will proceed with data compilation and analysis after receiving your endorsement, and IRB review and approval.

The purpose of the research is to explore and quantify social media utilization among health care providers, evaluate characteristics of health care provider's utilization preferences, and to develop an understanding of the health care provider's perceptions of the role of social media in health care delivery including potential benefits and barriers to utilization in practice.

Social media use is demonstrating growth among health care consumers, creating challenges and perhaps opportunities in health care. Social media may hold promise as a complementary methodology to traditional health care delivery practices. This research will provide baseline data relative to utilization and potential implications for application of this medium in clinical practice from the perspective of the health care provider.

Thank you for your consideration.

LaNora Dixon, BSN, MHA

Approved: _____

Date: _____

APPENDIX B

LETTER TO IRB

11/14/11

To whom it may concern:

In preparation for this graduate thesis study, this researcher has carefully and thoughtfully reviewed the IRB overview and student instructions. This researcher understands that research with human subjects is a privilege, not a right, and that there is enormous responsibility to protect the subjects of the research. This researcher understands that this research poses potential risk of breach of confidentiality of participants related to data collection via online survey instrumentation. Mitigation of this risk is discussed below. This researcher has completed the Collaborative Institutional Training Initiative (CITI) student's curriculum and responsible conduct for research curriculum, and copies of the certifications of completion are enclosed.

The purpose of this research is to explore and quantify social media utilization among health care providers, evaluate characteristics of health care provider's utilization preferences, and to develop an understanding of the health care provider's perceptions of the role of social media in health care delivery including potential benefits and barriers to utilization in practice. Details of the research methodology are outlined in the research proposal application. The research design is a non-experimental descriptive phenomenological study of health care provider's perceptions of the role of social media in clinical practice. This researcher does not anticipate any part of this research to involve greater than "minimal risk" to research subjects. The research does not study vulnerable populations and does not involve sensitive content questions as defined by the IRB application for exemption.

The procedure for data collection will be to utilize a validated online survey tool that is delivered through the sponsoring organization's Information Services (IS) department via global listserv to participants meeting the inclusion criteria of the study. Surveys will be completed anonymously and no identifiers will be attached to responses. Pin codes will be appended to surveys in place of participant's email addresses for respondent tracking purposes. Participation is voluntary and therefore consent is implied by virtue of voluntary participation. Nonetheless, an electronic consent and an opt-out option is provided in the online survey instrument. The findings will not be used or disclosed with any form of identifier. The research will be conducted without direct contact with the subjects. Without access to email addresses through the organization's Information Systems Department, for the purposes of conducting the online survey, the study would be impracticable to conduct in a feasible amount of time for graduate degree completion. Survey distribution via mail is deemed cost prohibitive and involves greater risk of names and personal address identifiers being inadvertently disclosed in association with the research mailing. As such, this researcher requests IRB approval for exemption and waiver of written consent, and HIPAA Privacy Authorization.

This researcher sincerely appreciates your consideration.

Enclosed are copies of the following documents:

- Research proposal
- Letter of endorsement from sponsoring organization
- CITI certificates of completion
- Resume of graduate student researcher
- IRB application (protocol checklist, Waiver of consent/HIPAA Authorization checklist)

Sincerely,
LaNora Dixon, BSN, MHA

APPENDIX C

CITI RESPONSIBLE CONDUCT OF RESEARCH

Responsible Conduct of Research Curriculum Completion Report

Printed on 8/28/2011

Learner: LaNora Dixon (username: ljb Dixon)

Institution: Montana State University

Social and Behavioral Responsible Conduct of Research Course 1.: This course is for investigators, staff and students with an interest or focus in Social and Behavioral research. This course contains text, embedded case studies AND quizzes.

Stage 1. Basic Course Passed on 08/28/11 (Ref # 6568533)

Required Modules	Date Completed	
The CITI Course in the Responsible Conduct of Research	08/28/11	no quiz
Introduction to the Responsible Conduct of Research	08/28/11	no quiz
Introduction to Research Misconduct	08/28/11	no quiz
Research Misconduct 2-1495	08/28/11	5/5 (100%)
Data Acquisition, Management, Sharing and Ownership 2-1523	08/28/11	4/5 (80%)
Publication Practices and Responsible Authorship 2-1518	08/28/11	4/5 (80%)
Peer Review 2-1521	08/28/11	5/5 (100%)
Responsible Mentoring 01-1625	08/28/11	6/6 (100%)
Conflicts of Interest and Commitment 2-1462	08/28/11	6/6 (100%)
Collaborative Research 2-1484	08/28/11	5/6 (83%)
The CITI RCR Course Completion Page.	08/28/11	no quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D. Professor, University of Miami, Director Office of Research Education, CITI Course Coordinator

APPENDIX D

CITI STUDENT'S CURRICULUM COMPLETION REPORT

Students Curriculum Completion Report**Printed on 9/25/2011****Learner:** LaNora Dixon (username: ljb Dixon)**Institution:** Montana State University

Students - Class projects: This course is appropriate for students doing class projects that qualify as "No More Than Minimal Risk" human subjects research.

Stage 1. Basic Course Passed on 09/25/11 (Ref # 6568534)

Required Modules	Date Completed	
Belmont Report and CITI Course Introduction	09/25/11	3/3 (100%)
Students in Research - SBR	09/25/11	8/10 (80%)
History and Ethical Principles - SBR	09/25/11	4/4 (100%)
Defining Research with Human Subjects - SBR	09/25/11	4/5 (80%)
Informed Consent - SBR	09/25/11	4/5 (80%)

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
 Professor, University of Miami
 Director Office of Research Education
 CITI Course Coordinator

APPENDIX E

VALIDITY CHECKLIST FOR SURVEY INSTRUMENT

- Do the respondents understand the survey's objective?
- Do the respondents feel comfortable answering the questions?
- Is the wording of the survey clear?
- Is the time reference clear to the respondents?
- Are the answer choices compatible with the respondents' experience in the matter?
- Do any of the items require the respondent to think too long or hard before responding?
- Do any of the questions generate response bias? Which ones?
- Do the answers collected reflect what you want in regards to the purpose of the survey?
- Is there enough diversity in the answers received?
- Is the survey too long?
- According to your test audience, have any other important issues been overlooked?

(Iarossi, 2006, pp. 90-92)

APPENDIX F

PERMISSION TO REFERENCE SURVEYMONKEY

Yes, as long as you provide proper citations. Please note that all content on SurveyMonkey's website is likely protected by copyright or trademarked. Survey content is generally owned by the user who conducted the survey. If you did not create the survey, you may need to seek his or her permission if you want to reference it.

Citation format:

- SurveyMonkey, <http://www.surveymonkey.com> (last visited [date])
- [Survey Creator's Name], [*Survey Title*], [http://www.surveymonkey.com/s/\[surveyID\]](http://www.surveymonkey.com/s/[surveyID]) (last visited [date])

Informed Consent

- See Appendix H Online Survey Consent
- Please be sure to include a data confidentiality statement in your consent form.
- The survey should allow for “no response” or “prefer not to respond” as an option for every survey question. A survey where a respondent cannot proceed without answering the question is in violation of the respondent's right to withhold information. No question on the instrument is required to move forward.
- At the end of the survey, the respondent should be given an option to withdraw from survey.

Database and Server Security

- SurveyMonkey will not use the information collected from your surveys in any way, shape or form.

APPENDIX G

SURVEY INSTRUMENT HYPERLINK

Appendix G: *Survey Instrument Hyperlink*

[Survey_24303648NewApril.pdf](#)

APPENDIX H

CONSENT FORM

SOCIAL MEDIA AND HEALTH CARE PROVIDERS:

Thank you for taking the time to complete this **10-minute survey**. This is a 20-question survey and should only take 5-10 minutes. **Your participation is voluntary, and you may opt-out of the survey at any time without penalty. Your responses are completely anonymous.** This survey link is being sent to you from a representative of this organization. This researcher does not have access to participant's email or IP addresses and no personally identifiable information is utilized or viewable with responses. I am conducting this research as my thesis work in partial fulfillment of the degree requirements for the Master of Nursing degree at Montana State University. Your feedback is important to me as I seek to understand your perspective, as health care providers, relative to the role of social media in health care delivery.

Brief Description of the study:

The purpose of this study is to explore and quantify social media utilization among health care providers, evaluate characteristics of health care provider's social media utilization preferences, and to develop an understanding of health care provider's perceptions of the role of social media in health care delivery including potential benefits and barriers to utilization in practice.

Social media use is demonstrating growth among health care consumers, creating challenges and perhaps opportunities in the way that health care providers communicate and engage patients. While research has been conducted relative to health care consumer's use of social media, there is little published data related to health care provider's utilization and perceptions of the role of social media in the delivery of care in practice. This research will provide baseline data relative to utilization and potential implications for application of this medium in clinical practice from the perspective of the health care provider.

LaNora Dixon, BSN, MHA, RN
Graduate Student
MSU College of Nursing
Bozeman, MT.

Clicking on the "Next" button below indicates that:

- you have read the above information
- you voluntarily agree to participate
- you are at least 18 years of a