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Social Media as a Healthcare Tool: Case Study Analysis of Factors Influencing Pediatric Clinicians' Behavioral Intent to Adopt Social Media for Patient Communication and Engagement

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SOCIAL MEDIA AS A HEALTHCARE TOOL: CASE STUDY ANALYSIS OF FACTORS
INFLUENCING PEDIATRIC CLINICIANS' BEHAVIORAL INTENT TO ADOPT SOCIAL
MEDIA FOR PATIENT COMMUNICATION AND ENGAGEMENT

by

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ABSTRACT

Social media has become a cultural norm; nearly two-thirds of adult Americans use a social media account for business or personal affairs. Social media aids communication among users worldwide. However, a notable gap exist among social media users, healthcare professionals who utilize social media in the work place. While the concept of harnessing social media as a professional tool is not novel, healthcare professionals have yet to embrace the practice as standard workflow. Successful use cases, such as the social media program at Mayo Clinic, are leading the way for an adoption breakthrough by demonstrating and sharing the benefits social media offers to healthcare. Additionally, the Institute of Medicine published a report calling for greater adoption of communication tools that can improve the quality of delivered care. Despite the best efforts from industry pioneers, many healthcare professionals have been reluctant to follow suit. Current research interest question what influences healthcare professionals to adopt social media, inferencing a lack of adoption inhibits the full potential of benefits patients should receive from healthcare.

This study seeks to identify factors that influence clinicians' behavioral intent to adopt social media as a healthcare tool, specifically addressing pediatric clinicians' adoption of social media for patient engagement and communication. Using a new framework developed by integrating concepts pulled from the Diffusion of Innovation, Technology Acceptance Model, Social Capital theories, the Healthcare Social Media Adoption Framework (HSMA) guides this mixed-method research approach in assessing 7 factors identified by theory and literature as adoption influencers (privacy concerns, ease of use, usefulness, trialability, relative advantage, organizational support, and interaction cultivation). A custom, web-based survey was

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administered to collect qualitative data from 60 full-time, pediatric clinicians (47 quantitative) at the case institution (a pediatric hospital). Additionally, individual interviews of 6 participants, the case institution's president, social media manager, communications manager, RN leader, patient care services leader, and clinical data security specialist provided their prospective on using social media for patient communications and engagement. A logistic regression was performed on the quantitative survey data, and a thematic qualitative analysis was used to gain further insights from the open-ended survey questions and interview discussions.

Privacy concerns were the only statically significant factor measured; with an inverse relationship to positive adoption intent, indicating higher privacy concerns influence lower behavioral intent to adopt social media for patient engagement and communication. However, practical significance is recognized for other variables in the model as well. The qualitative analysis revealed privacy concerns encompass two themes, personal privacy for patient and providers (boundaries), and cybersecurity. The qualitative inputs also uncovered perceived unprofessionalism as a new factor influencing clinician adoption. The implications for these findings indicate a need for both healthcare organizations and healthcare regulators to establish cybersecurity defenses for security and use protocols for privacy to aid the diffusion and adoption acceptance of social media use by pediatric healthcare professionals. Further, without parameters for security, privacy, and procedure for ensuring the two, social media will continue to be underutilized and the benefits to the medical community will be constrained. This research study has contributed in four areas: 1) fill a knowledge gap by identifying new factors that influence the behavioral intent of pediatric clinicians to adopt social media; 2) confirm or reject assumed behavioral intent influences found in the literature; 3) formulated a new theoretically

grounded framework, HSMA framework, that measures functional, cognitive, and social aspects

of social media adoption; and 4) to identifies priorities for use policies and global standards.

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CHAPTER 1: INTRODUCTION

The presented doctoral study examines pediatric clinicians' behavioral intent (BI) to adopt social media as a tool for engaging and communicating with patients. Research supports the clinical use of social media within healthcare practice (Cardona-Grau, 2017), showing benefits among clinical peers and for their patients. An encouraging discovery from providers currently using social media is higher patient engagement, involvement, and accountability (Househ, 2013) along with patient empowerment and increased two-way communication (Kotenko, 2013). Despite these findings, the clinical use of social media remains limited (White, 2015), especially in pediatric medicine (Alomar, Rouqi, & Eldali, 2016). The objective of the study is to identify influencing factors of adoption to open dialog for solutions aiding higher adoption behavior among healthcare providers; and ultimately, lending to a rise in positive health outcomes (Cardona-Grau, 2017).

Background

Healthcare providers tend to find routine and common preparation for their duties, relying on best practice and proven methods to guide their approach in clinical decisions and patient relationships (Spector & Kappel, 2012). However, the Institute of Medicine (IOM) identified an American healthcare quality crisis that calls for greater use of technical innovations, especially communication tools (Ried, Compton, Grossman, & Fanjiang, 2005). Newer, virtual modalities for patient communications and engagement have caused controversy among providers, creating a divide between those who choose to adopt and those who do not (Brown, Ryan, & Harris,

2014). Recent research reveals higher patient satisfaction from patients who engage with their

providers on more accessible and relatable modalities, such as social media platforms

(Schumacher and Lee, 2016).

Social media has brought individuals from different ages, races, genders, religions, beliefs,

and geographic areas together in a global societal community (Kumar & Sundarraj, 2018). With

the wide reach and large inclusion of online participants, social media offers an interactive,

convenient, and familiar modality for healthcare interactions (Hanzel, Schwitters, Smith,

Wendland, Martin, & Keltgen, 2017). Over the past decade, the progressive campaign

promoting the occupational use of social media by healthcare professionals has escalated

research interest (Ventola, 2014). Currently, social media users observe a small but distinct

presence of healthcare organizations on social media sites. Hospitals in particular have found

social media presence essential for gaining and retaining patients (White, 2015). Patients and

potential patients turn to online sources for information about facilities, providers, diagnosis, and

procedures (Morris, Devlin, & Parkin, 2007). A recent Health Management Academy survey

reported social media influenced nearly half of the participants shopping for healthcare services,

and 66% used a hospital's website or social media account to learn more about a facility or get

updates regarding their treatment (White, 2015).

Mayo Clinic has been particularly successful utilizing social media (Pennic, 2014). Mayo

Clinic operates a variety of social media platforms to accommodate patient learning and

communications. The Mayo Clinic Social Media Network (MCSMN) was established in 2010 to

help manage and focus the clinic's numerous social media initiatives. As of 2014, the MCSMN

managed several social media platforms for the clinic including Twitter, YouTube, Facebook,

Podcast, and Clinician Blogs (Kennedy, 2015). The MCSMN credits their social media presence with many organizational and patient benefits, the greatest of which is higher patient satisfaction ratings, a key aim in healthcare servicing (Pennic, 2014).

Though healthcare organizations have a substantial presence on social media, individual providers with professional pages are scarce (Berg, 2018). Social media offers patients and providers a common ground to build relationships, exchange information, and create accountability (Boachie, 2017). The overall tone of current studies indicate the adoption of social media for patient communications is favorable for both healthcare organizations and individual providers (Moorhead, Hazlett, Harrison, Carroll, Irwin, & Hoving, 2013), yet only a minority of clinicians are using social media in their routine practice (White, 2015). The primary factors identified as adoption hindrances are privacy and security (Chretien & Kind, 2013). However, there is still much to understand regarding the risk-benefit ratio of adopting social media and integrating its utility into standard healthcare practice (McCaughey, Baumgardner, Wu, Gaudes, LaRochelle, & Raichura, 2014).

Social Media Use in the Context of Pediatric Care

This dissertation focuses specifically on social media adoption in pediatric settings. Pediatric providers have even greater deliberations when contemplating inclusion of social media for patient communication and engagement (Bush, Connelly, Fuller, & Perez, 2016). Pediatric clinicians' currently utilizing social media in their practice have reported an increase in positive health outcomes; for example, the treatment and maintenance of pediatric asthma has found positive gains associated with direct patient communications regarding their condition and

treatment plans, along with better knowledge of their condition and higher compliance (Martinasek, Panzera, Schneider, Lindenberger, Bryant, McDermott, & Couluris, 2013). Areas such as pediatric surgery (Lopez, Hanson, Yorke, Johnson, Mill, Brown, & Barach, 2017) and dermatology (Fogel & Teng, 2016) are also using social media to connect with young patients. However, the unique patient/parent/provider dynamic requires a different approach to the way pediatric clinicians approach patient interactions (Bruener & Moreno, 2011). Adding a new communication modality easily accessed by unsupervised minors poses complications for pediatric providers and their parents. On the other hand, using a recognizable and comfortable platform young patients are presumably already using, could increase healthy outcomes and improve the population health within the youth demographic (Dyson, Shave, Fernandes, Scott, & Hartling, 2017). Teens age 13-17 are among the fastest growing social media user groups; citing over 70% of teens have at least one social media account (Schumacher & Lee, 2016). Pediatric provides have an opportunity to capitalize on this growing and engaged user group by adopting social media for patient communications, including messages to encourage engagement activities that have potential to increase patient accountability.

Similar to general healthcare, privacy and security concerns with social media use have been expressed by pediatric clinicians (Dyson, Shave, Fernandes, Scott, & Hartling, 2017). Added concerns of parental censoring and consent and emotional maturity that make pediatric care different from other medical specialties. These concerns are at the forefront of current literature covering pediatric clinicians' use and adoption of social media into their practice (O'Keeffe & Clarke-Pearson, 2011). Undoubtedly, there is a delicate balance between clinician - pediatric patient relationships and the clinician's relationship with the patient's guardian. Many clinicians

determine how to communicate and engage with pediatric patients on a case-by-case basis; noting some patients may be more independent and open to a direct relationship than others (Breuner & Moreno, 2011). Determining which patients are "good fits" for social media communication may also be a concern for pediatric providers (Blackstone & Pressman, 2011). Overall, the recorded benefits of social media use in pediatric medicine may be ever greater than general practice (Dyson, Shave, Fernandes, Scott, & Hartling, 2017); therefore, the gap in understanding what drives social media adoption for patient communication and engagement within pediatrics is valuable.

<div align="center">Problem Statement</div>

Harnessing the power and reach of social media for patient engagement and general communications (exchanges not containing private health information) presents an appropriate example for social media use in healthcare. Using social media to connect with patients has increased both patient and provider accountability and stimulates more frequent and open communication (Dyson et. all, 2017). The problem with clinicians not adopting social media for patient communication and engagement is the denial of benefits to patients. That is, the choice of a clinician to not adopt social media, knowing the welfares social media presents, is withholding potential physical and emotional benefits from their patients.

The Institute of Medicine (IOM) published six aims in healthcare that providers are ethically bound to uphold to provide the best standard and quality of care (IOM, 2001). The six aims are: safe, effective, patient-centered, timely, efficient, and equitable. Definitions for these terms are found in Appendix A Definition of Terms.

Further, the IOM defines a healthcare tool as "anything used as a means of accomplishing a task or purpose; further, tools can be repurposed in new ways or expanded upon which is known as innovation. Therefore, a healthcare tool is anything used as a means of accomplishing, or improving, any of the six healthcare aims." (IOM, 2001). Thus, the problem statement is established as:

Social media is a healthcare tool that potentially offers increased health benefits to patients. Therefore, investigation as to what promotes the adoption of social media among clinicians is needed to determine if the intent to adopt is prevalent; and if not, what is preventing clinicians from adopting social media as a health care tool.

Purpose of the Study

The purpose of this study is to determine what encourages and discourages pediatric clinicians to adopt social media for patient communications and engagement. Using influential adoption factors found in current literature and theory, the study measures the significance of each on clinicians' behavioral intent to adopt social media for patient communication and adoption. Thus, the findings from the study intend to provide the following contributions:

1. Insight on adoption behavior and adoption influencers for the adoption of social media by pediatric clinicians

2. Confirmation or rejection of assumptions around influencing factors suggested in the literature

3. Identification of new factors that influence adoption

4. Suggest priorities for the creation of a social media use policy and global standard in healthcare

Significance of the Study

The bulk of current research with focus on clinical uses of social media cover topics such as nurses use (Skiba, 2011) (Song, Lin, Ward, & Fine, 2013) (Spector & Kappel, 2012), popularity rankings of professional (paid membership) social media (Rolls, Hansen, Jackson, & Elliot, 2016), and the negative repercussions of social media use in healthcare (Fire, Kagan, Elyasher, & Elovici, 2013). Relatable studies acknowledge clinicians are not using social media to its potential; however, evidence based studies with empirical data explaining why adoption rates are low and well behind other industries are lacking (Chretien & Kind, 2013). Identifying catalyst and deterrents of adoption can promote focus on future efforts and solutions for improving adoption intent among providers or identifying potential barriers to adoption. Further, pediatric medicine is markedly specialized, in both practice and policy; the results of this study provides insight to concerns that encompass and exceed adult medicine standards (Kopelman & Moskop, 1989).

Overview of Study Framework and Design

Execution of the presented work followed a mixed-methodology approach, utilizing a case study sample population. Data was collected from both a survey and individual interviews with expert informants. Using an embedded design model to examine the data, each data set was analyzed independently before data triangulation techniques were applied to aggregate the

findings and draw conclusions. The theoretical framework guiding the design is novel to this

study. Elements from The Diffusion of Innovation (Rodgers, 1962), Technology Acceptance

Model (TAM) (Davis, 1989), and the Social Capital Theory (Putnum, 1995), were joined to

create the Healthcare Social Media Adoption framework (HSMA). HSMA integrates the

function of Rodger's Diffusion Theory with the cognitive concepts from TAM, and the social

measures within the Social Capital Theory. Construction of the HSMA model is detailed in

Chapter 3.

Definitions of Terms

Appendix A includes a full list of defined terms. The key terms are defined here as:

- Clinician: those that provide direct patient care

- Social media: The collective of online communication channels dedicated to community-based input, interaction, content sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are among the different types of social media. Some examples of popular social media are Facebook, Twitter, LinkedIn, and Google+

- Patient engagement and communication: All provider/patient messages and communications that are currently satisfied by phone calls, emails, and letters. The subject of correspondence to be considered includes all topics that do not currently require face-to-face communication.

- Use (of social media): Engaging and/or Communicating with Patients: Includes all provider/patient messages and communications that are currently satisfied by phone calls,

emails, and letters. The subject of correspondence to be considered includes all topics

that do not currently require face-to-face communication.

CHAPTER 2: LITERATURE REVIEW

The scope of literature reviewed includes an overview of the Institute of Medicine's

(IOM) six-healthcare aims and a review of like studies in topic, theory, and methodology. First,

the IOM's six healthcare aims define healthcare tools and the contexts of application. This study

suggests social media is a potential healthcare tool that can be utilized to advance the six aims.

Next, relevant topic studies were examined to identify the baseline of knowledge on the topic

and the theories connected to these types of investigations.

IOM Six Aims of Healthcare

The Institute of Medicine (IOM) released 'Crossing the Quality Chasm' in 2001, as a

follow-up to the *To Err Is Human* report. Estimates from the repot suggested healthcare systems

failures were responsible for at least 90,000 deaths each year. The "Chasm' report explains a

gap that exists between the quality of care the health system is capable of delivering and the

quality of care most Americans receive. The gap can partially be attributed to lack of diffusion

and adoption of innovative advances in medical science and technology (Berwick, 2001). To

remedy, the IOM calls for improvements in six dimensions of health care performance: safety,

effectiveness, patient-centeredness, timeliness, efficiency, and equity. Soon after the 'Chasm'

report was published, the National Academy of Engineering (NAE) initiated a project aimed at

identifying engineering applications that could contribute significantly to improvements in health

care delivery in the short, medium, and long terms. The result of the project was another report,

Building a Better Delivery System, which states the critical role information technologies,

especially communication tools, play in mending the healthcare quality crisis (Ried, Compton, Grossman, & Fanjiang, 2005). Further, later studies with focus on applying the six aims in pediatric medicine reported advancing communication technologies in pediatric care environments resulted in better quality of care (Slonim & Pollack, 2005).

Social media has been established as a business communication tool (Kudeshia & Mittal, 2015). Even within the healthcare industry, social media is an innovative communication technology that presents new possibilities for how patients receive care (Weaver, Lindsay, & Gitelman, 2012). Relevant to the six healthcare aims outlined by the IOM, social media has shown the potential to enhance five of the dimensions including effectiveness, patient-centric care, timeliness, efficiency, and equitability (Hannzel, Richards, Schwitters, Smith, Wendland, Martin, & Keltgen, 2017) (Househ, Borycki, & Kushniruk, 2014) (Dyson, Shave, Fernandes, Scott, & Hartling, 2017). Limitations to the use of social media in healthcare are also noted. Concerns regarding quality, reliability, confidentiality, and privacy are identified as potential hindrance to the diffusion of social media as a healthcare tool (Moorhead, Hazlett, Harrison, Carroll, Irwin, & Hoving, 2013). Studies identifying influencing factors call for further studies that provide empirical data on the impact of factors identified from opportunities and challenges of social media use in healthcare (e.g. quality of care, privacy), and new integrated models that emphasize the critical success factors for social media acceptance, adoption, and continuance in healthcare (Lim, 2016).

Relevant Topics

The literature review of relevant topics used meta-analysis methods to identify the considered studies. The search utilized all databases available through the University of Central Florida library. The primary inclusion characteristic for the selected critiques was research topic, including research focuses of healthcare technology, technology adoption, and/or social media use and adoption in healthcare. Further focus on inclusion criteria was established by narrowing the literature to studies published within the last 10 years, written in English, written in peer-reviewed journals, and offered full-text electronically. After all inclusion criteria was applied, 99 articles remained for examination.

Technology and Social Media

In the latest of technical times society has become accustom to on-demand fulfillment (Goggin, 2006). The internet, both loved and feared, has changed how we define communities, friends, and communication. The notion that virtual life isolates individuals and damages social skills has evolved as online social platforms emerged. The internet has created new ways to connect with others of like mind and interest (Castells, 2014). One of the greatest internet developments was the creation of social media (Castells, 2014). More than 3 billion people worldwide use the internet (Davidson, 2015), and 1.96 billion internet users have at least one social media account (Statistica, 2016). The number of social media users is predicted grow exponentially in the upcoming years, connecting people in a way only the digital millennium can offer (Pew Research Center, 2015). This phenomenon has been dubbed the "socio-technical revolution" (Castells, 2014).

As the number of social media users grow, so does the number of online social platforms. Social media has become a part of everyday life for most Americans. Stastica reports that as of 2016, 78% of Americans use social media. Facebook ranks as the third most popular site in the world and is the most popular social media site as of 2016 (Alexa, 2016). Facebook, a for-profit social media platform that launched in 2004, was created in a dorm room by a California co-ed who invented the site to aid in on-campus connections (Krikpatric, 2010). Today Facebook has 1.23 billion users globally. The market value is also astonishing, with a current estimated worth around $321 billion. What started as a one-man show now employees 12,691 associates (Smith, 2016).

Social media brings a new dynamic to how society connects. Networking, marketing, teaching, advertisement, and social associates have found space on social media sites (Tuten & Soloman, 2014). Social media is even creating an industry of its own, offering more than entertainment and chat sessions for its users. Individual professionals and business small and large create public profiles on social media sites, transforming how society establishes personal and business rapport (Warrington, Abgrab, & Caldwell, 2000). One particular phenomenon is the shift in modalities from correspondence to increasingly virtual communication. Transactions that once relied on face-to-face interactions and physical documentation are now satisfied with virtual meetings, inbox notes, or chat messages. Some direct communications have been replaced all together, with community discussion pages and review boards. Social media has changed the expectations for both private conversations and public information exchanges. The way society relates, communicates, researches, and connects has modernized and is expanding in

a virtual world where connections are not limited by language or geography (Kudeshia & Mittal, 2015).

Social media is appealing to users looking for online convenience. Social media platforms offer a "one-stop-shop" for personal, social, and business needs. Information about goods, services, professionals, and individuals are easily obtained and readily available on social media sites (Kudeshia & Mittal, 2015). For example, on Facebook alone there are 50 million active small business pages offering information about the services, associates, pricing, and of course, virtual correspondence (Smith, 2016). Facebook is not alone; other social media sites such as Twitter, Google+, BlogSpot, Instagram, and Reddit also have large global user populations maintaining constant connections along the information highway (Stelzner, 2015).

Social media offers connective reach matched by no other means. Business and service profiles offer important information to consumers and have been shown to aid in customer retention and recruitment (Kudeshia & Mittal, 2015). Consumers can access social media to investigate businesses and services. Sites and pages dedicated to business and service evaluations show candid ratings, rankings, and comments for public judgment. While public assessments may seem beneficial for consumers, false reports and skewed judgment is hard to prevent (Fire, Kagen, Elyashar, & Elovici, 2013). Further, the only requirement to create an account on most social media applications is a valid email address. Users of social media are generally not validated beyond the required email, and a single person may create many accounts, or profiles, on a single site by using multiple emails for account creations. The lack of authentication generates concern for fraud and misuse. Therefore, some individuals and business may be hesitant to affiliate with social media as a means to safeguard their identities. Social

media also cannot provide validity assurance on posted material. This means, the vast reach of

social media can spread false information just as quickly as truthful contributions (Househ,

Borycki, & Kushniruk, 2014). Consequently, social media platforms may be a double edge

sward; however, research has shown not having a presence on social media can destroy

consumer trust (Warrington, Abgrab, & Caldwell, 2000).

To exemplify the power of social media, Social Media Today (defined on their website as

an online community and resource for professionals in marketing, social business,

communication, customer experience, content marketing and digital strategy, or any other

discipline where a thorough understanding of social media is mission-critical) published statistics

from a compilation of recent social media studies; notably:

- 71% of consumers are likely to purchase an item based on social media referrals

- 74% of consumers rely on social media to making a buying decision

- 78% of people said that social media posts of companies influence their buying decisions

Each minute social media sites gain new users (Smith, 2016), and with each new user the power

and influence of these networks increase (Matcalfe, 1995). The general use of social media has

been well documented, but as the networks expand so does the potential utility. Social media has

proven to be a powerful tool promoting the diffusion of ideas, opinions, and information. New

norms for social behaviors and expanded networks beyond physical reach opens opportunity for

commerce. Many industries have already taken advantage of social media networks, expanding

their brand through the use of social media. Banking, real estate, entertainment, restaurants,

travel, and fashion are ranked as the highest social media using industries and all have shown an

increase in customer base and loyalty as a result of adopting social media as a business tool

(Stelzner, 2015). Yet, among the list of top industry users, there is an obvious gap. Social service industries have a small social media presence in comparison to other professions. Beyond buying and selling, social media offers a new way to provide public welfare. Harnessing the power of social media for greater good may be the next modernization of social services, particularly healthcare (White, 2015).

Technology and Healthcare

Rudolf Christoph Eucken, a social philosopher and Nobel Prize winner, said, "Technological progress becomes even more exciting when it enters into the service of the social idea which demands that not only a small elite but humanity at large should profit by it" (Frenz, 1999). What better example of beneficial servicing of humanity at large than the healthcare industry? Historically healthcare has not quickly adopted new technology. Typically, innovation adoption is delayed beyond its point of novelty. When compared with other industries, healthcare is a laggard adopter industry (White, 2015). However, the importance to keep technology current is not lost to healthcare professionals. The intent to keep current is honest, but the lack of enthusiasm among clinicians when presented with new technology is beyond apparent in technology adoption research (DePhillips, 2007).

Researchers and industry professionals agree that augmenting technology is necessary for the sustainment and advancement of healthcare (Kouri, Rissanen, Weber, & Park, 2017). Research shows not all innovations are accepted or rejected equally. Clinical and pharmaceutical advances can yield immediate gratification, saving lives and offering opportunity and hope for many patients. Clinicians are more accepting of clinical technology than applications of

operative, clerical nature. Yet, the significance of business and communication applications are

equally important for patient outcomes and compliance (Goth, 2005). This becomes especially

true since the U.S. healthcare system underwent a paradigm shift to patient-centric care with

outcome-based pay (Lavallee, Chenok, Love, Peterson, Holve, Segal, Franklin, 2016). The

ability to reach patients in a way that is convenient to them, to include patients in their healthcare

journey, to give knowledge to the community, and understanding to patient families are

important aspects of clinicians' duties. New methods for existing tasks bring challenges and

most definitely change; but if the common goal remains to provide the best care possible, then

the quest to identify adoption hindrance factors should continue until the drive to overcome

barriers, without hesitations, is standard practice (Lin, Lin, & Roan, 2012).

The impetus for healthcare to become more cybernetic has come from private and public

stakeholders. For example, The American Recovery and Reinvestment Act of 2009 grants

monetary incentives, such as direct payment from public insurers and Federal grants, to hospitals

and providers that adopt new health information technology (Department of Health and Human

Services). Private insurers also offer stimulus to providers using electronic data exchange for

claim submissions (Weaver, Lindsay, & Gitelman, 2012). However, even with incentives in

place, U.S. healthcare facilities and providers using electronic technology has not reached 100%

(Department of Health and Human Services, ONC). Regulations aimed to protect patients while

supporting technological growth have been established in more recent years. The Health

Insurance Portability and Accountability of 1996 (HIPAA) and the Health Information

Technology for Economic and Clinical Health of 2009 (HITECH) (US Department of Health and

Human Services) were implemented to protect patients' private health information while

promoting the meaningful use of healthcare information technology. While useful for Electronic

Medical Records and e-signatures, neither of these Acts specifically address the clinical use of

social media. To date, no formal standards or regulations for the clinical use of social media are

established. The absence of adequate guidelines may contribute to adoption apprehension in an

industry dependent on trusting relationships and confidentiality (Spector & Kappel, 2012).

To date, nearly all clinicians use at least one computer-based application. Today's

clinical applications house and exchange health information across virtual connections with the

intention to reduce cost and improve efficiency (Riskin, Koppel, & Riskin 2015). Clinical

workflows have been altered by the inclusion of virtual tools. To avoid disruption, users avoid

adopting these technologies unless use become mandatory (Leidner, Preston, & Chen, 2010).

Past studies have attempted to determine why healthcare is technically averse. Leidner, Preston,

and Chen (2010) suggested that leadership, top management's attitude, and impact on financial

performance are key indicators for technical adoption. Accordingly, recent studies have implied

that more research should be done on the role Organizational Support plays in technology

adoption at healthcare institutions (Riskin, Koppel, & Riskin, 2015). Other research suggests

healthcare's best practice guidelines do not include defined paths for successful technical

implementations. These studies focus on clinician performance and disruptions to workflow.

Findings from these studies determined if clinicians do not find a newly introduced technology

useful to their practice, or too cumbersome to their workflow, then the technology will be

dismissed (O'Connor, O'Reilly, & O'Donoghue, 2013). However, contrary arguments suggest

sufficient training should remedy dismissal of a new technology based on the perception of little

utility or workflow inconveniences (Riskin, Koppel, & Riskin, 2015).

Healthcare and Social Media

Innovations that do not require extensive training or high-dollar investments often diffuse quicker at higher adoption rates than those that require training at large costs (Rodgers, 1995). Most social media is available free of cost, and the majority of healthcare professionals are already using social media in their daily lives (Pew, 2015). Based on Diffusion logic and convenience, social media should be readily accepted by healthcare professionals; however, it is not. The idea of personal health information available on a public domain may seem too risky for some providers. Others may feel the interactions are not personal enough (Smailhodzic, Hooijsma, Boonstra, & Langley, 2016). Most conclusions point to the sensitive nature of healthcare information stunting the expansion of social media use in healthcare. Several studies concerning nurses using social media bring attention to privacy concerns (Spector & Kappel, 2012) (Househ, 2013) (Kouri, Rissanen, Weber, & Park, 2017). Additionally, instances of unintentional miss-use, such as inadvertently posting private health information or responding to a private health question on a public forum, presents a threat to the adoption success of social media in healthcare. A common call among the reviewed literature requested research addressing the need for use parameters of social media in the healthcare setting (Skiba, 2011) (Kouri, Rissanen, Weber, & Park, 2017).

Some industry leaders are attempting to fulfill the need for use parameters. Recently the Mayo Clinic Social Media Network (MCSMN) collaborated with Hootsuite, a social media management company, to create the first nationally available training program that teaches their take on proper use of social media for healthcare professionals. The program is a four-hour course and offers a certificate after successful completion of an exit exam. Physicians who

complete the course and exam may apply the certificate towards one American Medical Association Physician Recognition Award (AMA PRA) credit (Mayo Clinic Social Media Network, 2016). However, the program does come at a cost (varied cost depending on membership status) and non-physician clinicians do not benefit from the education credit for successful completion. Another weakness of MCSMN's program is the lack of peer and competitor involvement in the development of the curriculum. The instruction delivered by MCSMN is based on the best practice opinions of its creators, MCSMN. Healthcare institutions with different missions, values, goals, or culture have been hesitant to support MSCMN's training for their associates. The lack of universal standards has led to institutions creating their own homegrown social media guidelines, applicable only internally for the organization. Without a unified standard to base local directives, the use of social media as a healthcare tool will remain risky (Ventola, 2014).

Currently, Peer-to-Peer sites are the most common social media used in healthcare (Kouri, Rissanen, Weber, & Park, 2017). Peer-to-Peer platforms are provider-centric, where healthcare professionals interact with each other. Specifically, Peer-to-Peer forums are clinician only networks used to make connection, share information, and seek opinions on current health issues (Chretien & Kind, 2013). The benefits observed from providers with Peer-to-Peer access include improved professional networking and education, organizational promotion, and collaboration among peers the current obstacles healthcare is facing. Peer-to-Peer sites require memberships, impose fees, and do not allow non-practitioners to participate (Ventola, 2014).

Publications supporting the benefits of Peer-to-Peer social media do not examine clinical use of patient-centric, open-membership sites, such as Facebook. Patient-centric social media

use is a developing topic among the research community (Househ, 2013). The available findings suggest the greatest potentials include higher patient engagement and enhancement of patient satisfaction. Patient satisfaction is a key indicator and measure for healthcare institutions and providers receiving reimbursement based on patient outcomes (Lateef, 2013). The most common notion among the patient-centric social media studies is the importance of responsible use by clinicians that should be upheld by a standardized policy (Jha, Lin, & Savoia, 2016). The American Medical Association (AMA) recognizes the need to teach responsible use of social media by healthcare professionals. Their website recommends incorporation of professional etiquette for clinical social media use in medical school curriculum. Consequently, many academic programs now teach online professional protocol (Kind, Patel, & Lie, 2013). However, since the AMA nor the MCSMN are universally acknowledge at this time there is still a need to establish use policy.

<center>Pediatric Studies</center>

The AMA marked social media use in pediatrics as a "red zone" area, meaning use may not be suitable for this area of practice (Kind, Patel, Lie, 2013). Nonetheless, progressive pediatric clinicians have tested social media use and report great success. Studies from many pediatric specialties report successful adoption of social media into their standard practice (Cardona-Grau, 2017). Current literature often focuses on a sub-specialty department within pediatric medicine. Areas including heart disease (Schumacher, Lee, & Pasquali, 2015), dermatology (Fogel & Teng, 2016), surgery (Ramano & Baum, 2014), urology (Cardona-Grau, 2017), and emergency (Alomar, Rouqi, & Eldali, 2016) share initial insight on the use of social

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media in pediatric medicine reporting patient engagement, parental involvement, and distance consults, and patient counselling as the most common uses of social media in pediatric healthcare.

Obstacles to social media adoption were also found in the pediatric literature. Pediatric clinicians participating in an Asthma study that used social media for patient communication reported time constraints during office hours, personal commitments, work schedules, lack of comfort with the technology and perceived liability issues presented adoption barriers (Martinasek, Panzera, Schneider, Lindenberger, Bryant, McDermott, & Couluris, 2011). Additional limitations found included participant responsiveness, obtaining buy-in, and resources required to operate and maintain the platform (Dyson et. al, 2017). Similar to the literature for social media in general healthcare, pediatric studies proposed further investigations on adoption hindrance, privacy concerns, and policies for uses.

In total, 10 articles were found with the direct topic of social media use in pediatrics. Four of the articles were opinion based and/or created conclusions from adult studies and known facts about the use of social media (Kind, Patel, & Lie, 2013) (Lopez, Hanson, Yorke, Johnson, Mill, Brown, & Barach, 2017) (O'Keeffe & Clark-Pearson, 2011) (Schumacher, & Lee, 2016). The remaining 6 articles collected data in various ways; a summary of their methods and findings are outlined in Table 2.1.

Table 2.1 Pediatric Studies Literature Review Summary

Article Authors	Method	Main Findings
Alomar, Rouqi, Eldali (2016)	Case study, interview, chi-square, regression	41% of pediatric patients and their caregivers preferred to learn more about first aid for pediatric burns via social media
Cardona-Grau (2017)	Interviews, means comparison	119 parents in pediatric clinics were younger, more likely to have social media accounts and access them daily compared with the adults queried who were attending their own clinic visits. The parents queried felt it was important for physicians and medical organizations/journals to have a social media presence compared with the patients queried in adult clinics (92.4% vs. 65.8%, $p < 0.01$).
Dyson, Shave, Fernandes, Scott, Hartling (2017)	Two-phase, mixed methods study with a sequential exploratory design using cross-sectional quantitative web-based survey and then used a discussion moderated via Facebook. Survey and discussion data were collected via the internet.	Although participants' priorities sometimes aligned with outcomes frequently reported in the literature, this was not always true. Additional priorities from the survey (n=50) and Facebook discussions (n=4) included healthcare access, interacting with healthcare providers, education, impact on daily Appealing and efficient strategies to engage patients and parents in research should be developed.
Fogel, Teng (2016)	Between April 25, 2015, and May 20, 2015, assessed seven leading social media platforms for the presence of stakeholders and evaluated whether social media accounts were maintained, as well as the level of repeatedly engaged users for each platform, measured according to "likes" and "subscribers."	Observations suggest that all stakeholder groups, and in particular members of the research community, have the potential to further their engagement, connections, and communications through social media.
Martinasek, Panzera, Schneider, Lindenderger, Bryant, McDermott, Couluris (2013)	In-depth interviews and a focus group to understand pediatric attending physicians' and residents' perspectives of social media technology use in asthma management, analyzed data using the constant comparative method.	Identified benefits include enhanced understanding of how adolescents perceive asthma, improved patient-provider relationships, the availability of an interactive venue and an additional way to provide accurate information to asthmatic teens. The barriers consisted of time constraints during office hours, personal commitments, work schedules, lack of comfort with the technology and perceived liability issues. Social media technology is considered a valuable tool to reach this target population. The barriers of using social media need to be overcome for voluntary adoption to occur. Social media technology may provide a dynamic platform for both health education and allow physicians to better understand the needs and wants of adolescents with chronic diseases.
Schumacher, Lee, Pasquali (2015)	Meta-analysis	Social media's influence on medicine extends beyond use by patients. It directly affects all medical providers, both users and non-users; social media has the ability to improve care for patients with pediatric heart disease.

Social Media use by the Pediatric Patient Population

The Pew Institute (2015) reports that 71% of teens ages 13-17 have at least one social media account that they access at least once a day. Younger users continue to join social media and are impressionable to viewed content. Teens online creates an opportunity for pediatric health professionals to engage patients via social networks. Pediatric studies show health education and self-accountability can be reinforced through social media and contribute to positive outcomes (Schumacher and Lee, 2016). Patient support groups can greatly influence health choices, especially for teens. Current research suggest social media can provide a common ground where pediatric providers, patients, and parents can come together to discuss health matters and educate one another. Open conversations lead to more educated children who make better, more informed, health decisions (Martinasek et. all, 2013).

According to a surveyed group of health professionals, there is a need to create proper protocol for social media use in pediatric healthcare. Providers that have tested clinical social media use and report success in achieving positive gains with their patients (Fogel & Teng, 2016).   It appears parents of patients want social media too. A survey of 253 subjects, 119 parents of patients and 134 adult patients, at urology clinics found that parents of pediatric patients were younger and more likely to have social media accounts than the adult patients surveyed. Additionally, 92.4% of the parents felt it is important for providers to have social media presence, compared to only 65.8% of the adult patients (Cardona-Grau, 2017). The extra layer of sensitivity around pediatric care may require special instruction beyond a standard guideline. One study suggests Institutional Review Boards should create protection requirements

for providers who wish to engage pediatric patients via social media (Kouri, Rissanen, Webber, & Park, 2017).

Summary

The reviewed literature established social media as a communication tool and outlined its potential benefits, along with adoption barriers, in health care. Current research concentrates on community social media sites (organizational level), nurse applications and use, and Peer-to-Peer platforms rather than clinician adoption for patient interactions. Existing pediatric, patient-centric, social media research is limited but the existing knowledge has contributed mostly positive feedback; creating a basis for additional studies to expand upon. Recent studies aimed at identifying barriers to clinicians' adoption of social media are limited and primarily based from theory and call for supportive follow-up studies to confirm their findings, leaving a knowledge gap for this study to fulfill. Next, Chapter 3 covers the theoretical framework, followed by Chapter 4 detailing the research methodology used in this study.

CHAPTER 3: DEVELOPING THE HEALTHCARE SOCIAL MEDIA ADOPTION (HSMA)
FRAMEWORK

After reviewing the germane studies, implications, and suggestions for future research, an awareness that a new model, specific for social media adoption in healthcare, may be needed. Per the suggestion of Lim (2016) "new integrated models that emphasize the critical success factors for social media acceptance, adoption, and continuance in healthcare" should be considered first, allowing for an understanding of who adopts social media in healthcare, where these clinicians practice, when they choose to adopt, and why adoption is successful for avoided. This study created the Healthcare Social Media Adoption Framework to identify the factors influencing social media adoption by pediatric clinicians.

Current Rational and Theory Explanations for Low Adoption of Social Media among Clinicians

Existing rationale for the low adoption rates of social media among healthcare providers suggest the primary hindrances are the lack of protocol on proper use of social media by medical professionals hinders adoption (Spector & Kappel, 2012), and privacy concerns. As stated in the literature review, there are no legally binding nor globally standardized criteria for appropriate occupational use of social media in healthcare at this time. However, groups like the MCSMN are working to create this doctrine by offering courses to clinical professionals that teach ethical use of social media and self-defined best practice, still, the courses are not regulated nor standardized by governmental or professional bodies (Chan, 2016). The American Medical Association (AMA) also has recently taken interest in social media protocol. The AMA published their ethical guidelines for clinicians' social media use on their website; however, the

recommendations concentrate on personal use of social media, which is clinicians' personal profiles and accounts, rather than the appropriate use cases and strategies for patient interactions (American Medical Association Professionalism and Social Media Use Workshop, 2012).

Research indicating privacy concerns are the culprit for low adoption rates among healthcare professionals considering adding social media to their utility (Househ, Borycki, & Kushniruk, 2014). Include topics of data security, identity verification, and personal boundaries. These limitations may overshadow potential benefits, preventing mass adoption (Chretien & Kind, 2013). Current safeguards against privacy concerns are limited. The Health Insurance Portability and Accountability Act (HIPAA, 1996) provides privacy expectations for providers that may be applied to social media. HIPAA instills strict bounds and penalties for the protection of patient information (U.S. Department of Health and Human Services, 2017). However, the lack of media specificity inadvertently exposes loopholes where malicious and accidental offenses may not be punishable. Another consideration are the exchanges between patients and providers that do not include private health or personal information. These interactions are not covered by HIPAA, though the information exchanged may still be misinterpreted or misused, a risk some providers may not be willing to take (Househ, Borycki, & Kushniruk, 2014).

Theoretical arguments offer another perspective. According to Rodgers (1962), innovation adopters are categorized in to five groups along the diffusion timeline. The first 2.5% of adopters are the Innovators; the next 13.5% are the Early Adopters, followed by the Early Majority and the Late Majority, that account for 34% of the adopter population each. The last 16% of adopters are the Laggards. The Laggard group are the last to adopt innovation and generally show little to no opinion leadership. Laggards are also often averse to change and can

be too focused on traditions. The healthcare industry at large are Laggard adopters (Coye, Aubry, & Yu, 2003).

Considering the relative newness of social media use in healthcare, perhaps clinicians are behind the times, but on track for their expected rate of adoption. Overall, healthcare adopters further complicate Laggard adoption with slow internal diffusion practices. Healthcare is a complex system with many forces shaping the decisions of clinicians who must consider the consequences of adopting innovation that affects those they vow to protect (Greenhalgh, 2001). Issues of information asymmetry and knowledge asymmetry between healthcare professionals and patients slows the diffusion of adopting new technology. Additionally, clinicians' lack of acknowledgement for the relative advantage (the advantages of an innovation over a current tool used for the same purpose) may also attribute to slow internal diffusion (Cain & Mittman, 2002).

Gap in Existing Rational and Theory for Explaining Low Adoption of Social Media by Clinicians

As suggested by Lim (2016), a new model is needed that evaluates identified influencing factors of adoption for criticality and prevailing relevance. Additionally, current explanations are redundant and narrow in scope, sticking to the repeated and obvious factors without branching out to identify any potential new factors that influence adoption. The Healthcare Social Media Framework was developed to evaluate the current factors and potentially identify new factor that influence social media adoption by clinicians.

<center>Synthesizing Relevant Theories</center>

Using the same meta-analysis presented in Chapter 2, the connected studies were further analyzed for their theoretical framework. There are numerous theories used in healthcare research; however, three prominent theories were identified, the Diffusion of Innovation (McCaughey, Baumgardner, Gaudes, LaRochelle, & Raichura, 2014), the Technology Acceptance Model (Rolls, Hansen, Jackson, & Elliot, 2016), and the theory of Social Capital (Hanzel, Richards, Schwitters, Smith, Wendland, Martin, & Keltgen, 2017). Each of these theories contribute to the creation of the Healthcare Social Media Adoption Framework, created for this study.

Diffusion of Innovation (DOI) was the most popular theory found in healthcare technology studies. DOI was the primary framework for 84 of the 99 articles, most of which focused on healthcare and non-social media technology (Zhang, Yu, Yan, & Ton, 2015). Research on work process changes and new technology expansions were found to be the primary application of DOI (Weigel & Hazen, 2014). Only seven DOI articles reviewed presented research on the adoption of social media in healthcare; though the inclusion criteria for the term 'social media' incorporated applications outside of the scope of this study such as telehealth applications and Peer-to-Peer sites. None of the reviewed DOI literature directly addressed the adoption or adoption intent of clinicians to use social media for patient communications and/or engagement.

Not only was DOI the most relevant theory found in healthcare research, the use of DOI frameworks is well accepted by healthcare regulation agencies (Conn, 2011). To gain broader insight, analogous searches using combinations of the qualifying characteristics was also

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assessed. A query using only 'DOI' and 'healthcare' as key terms returned over 5,500 studies.

The search returns confirm other researchers' claims that DOI is a well-documented, validated

framework for healthcare process inquiries (Taylor, Coates, Wessels, Mountain, & Hawley,

2015). Next, a query using the key terms 'DOI' and 'social media' returned 557 articles.

However, the search results included publications that were not healthcare oriented.

Nonetheless, the use of DOI in social media research was established with the literature found.

Noticed in the DIO literature review, healthcare research often utilizes DOI and the

Technology Acceptance Model (TAM) in tandem (Weaver, Lindsay, & Gitelman, 2012). Using

the key terms 'healthcare' and 'social media', the TAM was presented in 15 of the 99 reviewed

articles. Eight of the publications exhibited research on adoption, but the research concentrated

on community adoption rather than clinical adoption. Bringing the emphasis back to theory, key

terms 'TAM' and 'healthcare technology' were used to identify the prevalence of TAM in the

studies germane subject. The search returned 1,144 articles publishing the use of TAM in

healthcare-technology. The researcher did not review all 1,144 articles; rather selected 15 of the

most recent publications to review. A theme emerged from the reviewed TAM studies; each

stated and cited the proven record of accomplishment utilizing TAM in healthcare research as a

reliable model for aid in determining influencing factors of adoption (Ward, n.d.).

TAM was also found to be applicable in social media research, producing 1,168 articles

when key terms 'TAM' and 'social media' were used in the search. These studies did not have a

healthcare focus, but were significant in understanding validated TAM measures. Again, 15 of

the most recent articles were reviewed. The assessment of the TAM articles found three

important considerations for using TAM in this study. First, user acceptance can be universally

interpreted with TAM concepts. Second, factors such as perception and external influence were found to be significant influencers on acceptance, and last, surveys are the data collection instrument of choice for TAM based studies (Hussein & Hassan, 2017).

DOI and TAM provide a decent framework for technology adoption research, especially when used in tandem. However, many of the reviewed studies note a limitation of the theoretical duo – a lack of an accurate measure for social influences (Chang, Huang, Fu, & Hsu, 2017). Social influences are important since adopters of technology are not in a vacuum. While TAM does attempt to account for external influences, it does not provide a thorough understanding for the complexity of social impacts and network dynamics.

The Social Capital Theory (SC) has been presented as a solution for the missing measure when applied appropriately (Nielsen & Mengiste, 2014). Only one article was found using key terms 'Social Capital', 'healthcare', and 'social media'. The sole publication focused on peer-to-peer mHealth and was hard to parallel to this study (Banas, Victorson, Gutierrez, Cordero, Guitlleman, & Haas, 2017). However, following the method of the previous theoretical investigations for DIO and TAM, searches using key terms "Social Capital Theory' and 'healthcare', then 'Social Capital Theory' and 'social media' were assessed.

Social Capital Theory was found in 138 healthcare technology studies, though the spectrum of healthcare technology was broad and not limited to information technology. Many were not relevant for comparison. Next searches using key terms 'Social Capital Theory' and 'healthcare innovation' then ''Social Capital Theory and 'social media' returned 17 and 5,000 articles respectively. The first search, Social Capital Theory and healthcare innovation, had two major themes among the 17 articles, leadership development (Roberts, 2013) (Currie, Finn, &

Martin, 2008) (Swensen, Gorringe, Caviness, & Peters, 2016), and reputation management (Kaul, Chaudhri, Cherian, Freberg, Mishra, et. al, 2015) (Hubby, Harris, Powell, Kielman, Sheikh, et. al, 2014).

The Diffusion of Innovation, Technology Acceptance Model, and Social Capital Theory each deliver relevance to the research topic along with previously validated application in the healthcare industry. Assessment of the literature as a whole outlines the scope of this study's purpose. The three theories used together as a single construct (See Table 3.1 HSMA Constructs and Validated Measures in next subsection) for prevalence and spread of innovation, the behavioral intent to adopt, and social influences forms the foundation for the new theory, the Healthcare Social Media Adoption Framework (HSMA). The next subsection presents brief reviews of the sentinel work for each of the three theories that contribute to the creation of the HSMA.

Seminal Work of Relevant Theories

The following discussions present the main concepts from the seminal works of the Diffusion of Innovation (Rodgers, 1962), Technology Acceptance Model (Davis, 1989), and the Social Capital Theory (Putnam, 1995), along with how the theory contributes to the forged theory, the Healthcare Social Media Adoption Framework (HSMA).

Diffusion of Innovation

The Diffusion of Innovation seeks to explain the profusion of new ideas and technology. The theory outlines what innovation is, who adopts innovations, the communication channels

that transfer innovative ideas between potential adopters, timelines for adoption, and external influences on a potential adopter. By definition using social media as a healthcare tool is an innovation and health professionals and institutions are notorious laggard adopters (last to adopt new ideas and technology). It is important to recognize that the Diffusion of Innovation, the transmission of new ideas, is not the same as the adoption of innovation. Once innovation reaches a new node on the communication channel, it is up to the node to accept or reject the innovation. Therefore, the Diffusion of Innovation theory cannot stand alone in explaining adoption (Rodgers, 1962).

The Diffusion of Innovation serves as the foundation of the Healthcare Social Media Adoption Freamework (HSMA). The five stages of adoption defined by Rodgers are directly applied in the HSMA. The stages in order are knowledge, persuasion, decision, implementation, confirmation. Each stage creates a baseline for the social media adoption process and serves as the root connection of HSMA's combined theories. Additionally, Relative Advantage and Trialability are identified as influencers on adoption intent (Rodgers, 1962).

Technology Acceptance Model

TAM provides strength in measure for this study as it focuses on actual adoption. The Technology Acceptance Model (TAM) originated as an information systems theory but has been expanded many times since its inception. Davis (1989) developed two key TAM measures. Perceived Ease of Use and Perceived Usefulness (See Definition of Terms, Appendix A). Ease of use and Usefulness are included in this study as potentially influential factors. Davis also tested these measures robustly, validating the applicability of each. Previous studies state

surveys are reliable in measuring TAM variables. Criticism of TAM emphases the failure to explain social and cognitive elements in an adoption decision. However, alternative models have attempting to directly include measures for social factors have failed to replace the original in academic studies (Kwak, Park, Chung, & Ghosh, 2012).

Social Capital

The Social Capital Theory explains human capital among social networks. Transactions among social network members are valued by reciprocity, trust, cooperation and are seen as an expression of community governance and collective action. Putnam (1995) modernized Social Capital by adding the concepts of bonding and bridging. Bonding occurs when homogeneous social networks interact. Bridging is the interaction of heterogeneous groups. Social media development is a bridging capital tool. Social Capital theorist do note that social capital is not equally available to everyone and can create negative effects in a network (or group). These negative impacts include value interjecting (societal norm pressures) and solidarity (exclusion) (Portes, 1998). While there is not a signally accepted way to measure social capital, the most relevant studies utilized measures from the Integrated Questionnaire (IQ) (Grootaert, Narayan, Jones, & Wollcock, 2004). In the HSMA, Social Capital contributes Interaction Cultivation as a potentially influencing factor on adoption (Hubby et. al, 2014).

Healthcare Social Media Adoption Framework (HSMA)

The Healthcare Social Media Adoption Framework (HSMA) intends to acknowledge the complexity and novelty of the research topic. Using the mixed-methodology approach adds

layers to the investigation that no single found theory could explain. Therefore, the three

prevalent theories found in the meta-analysis (Diffusion of Innovation, Technology Acceptance

Model, and Social Capital) were aggregated as previously described to create HSMA. Each

theory was scrutinized for strengths and weaknesses. Only the most applicable aspects were then

reconsidered and carefully strung together to create the custom schema. Innovative behavior

scales and communication privacy management constructs were also included to provide

validated measures for Organizational Support and Privacy Concerns. Figure 3.1 provides an

overview visual for the HSMA and how each theory contributes to the overall model, followed

by Table 3.1 which identifies the source for each validated measure used within the model.
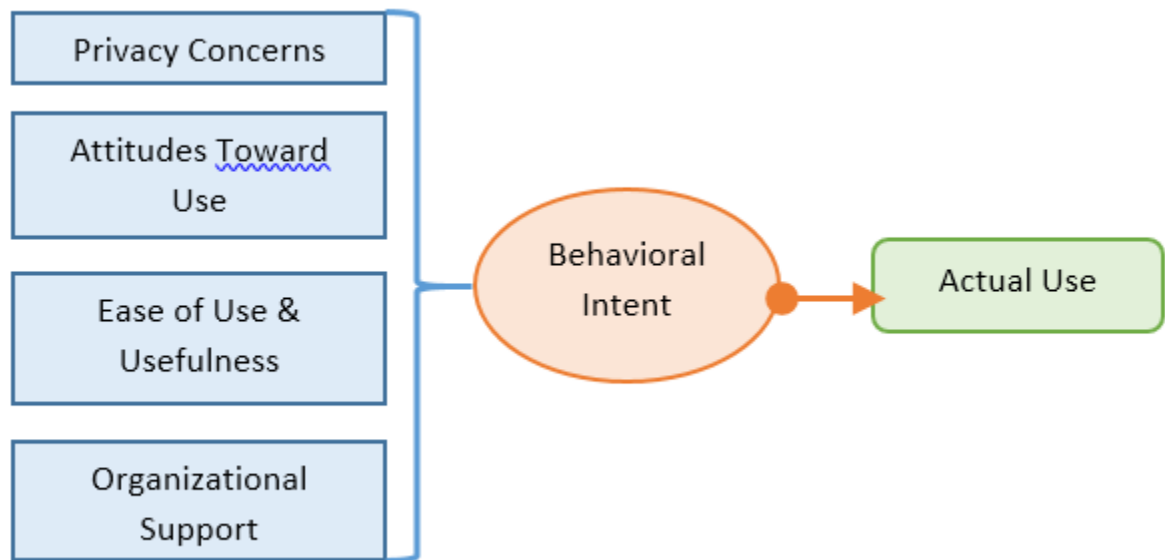
Figure 3.1: Healthcare Social Media Adoption Construct Overview

Table 3.1: HSMA Constructs and Validated Measure Sources

Foundational Theory	Construct	Source
	Actual Use	
Technology Acceptance Model	*Behavioral Intent*	Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, (2). 186.
	Usefulness	
	Ease of Use	
Attitude Towards Use		
Social Capital	*Interaction Cultivation*	Gelderman, C. J., Semeijn, J., & Mertschuweit, P. P. (2016). The impact of social capital and technological uncertainty on strategic performance: The supplier perspective. Journal Of Purchasing And Supply Management, 22
Diffusion of Innovation	*Relative Advantage*	Atkinson, N. (2007). Developing a questionnaire to measure perceived attributes of eHealth innovations. American Journal Of Health Behavior, 31(6), 612-621.
	Trialability	
Other (Innovative Behavior Scales)	*Organizational Support*	Lukes, M., Stephan, U. (2017) "Measuring employee innovation: A review of existing scales and the development of the innovative behavior and innovation support inventories across cultures", International Journal of Entrepreneurial Behavior & Research, Vol
External Impacts		
Other (Communication Privacy Management)	*Privacy Concerns*	Heng Xu, h., Dinev, T. t., Smith, J. j., & Hart, P. h. (2011). Information Privacy Concerns: Linking Individual Perceptions with Institutional Privacy Assurances. Journal Of The Association For Information Systems, 12(12), 798-824.

Summary

In summary, a new framework, the Healthcare Social Media Adoption Framework (HSMA) was developed for this study as a new means for assessing social media adoption by pediatric clinicians for patient communication and engagement. The HSMA combines concepts mainly from the Diffusion of Innovation, Technology Acceptance Model, and Social Capital theories to create comprehensive measures for potentially influencing factors on adoption. Factors selected for this model were identified in the review of pertinent theories and literature

and include ease of use, usefulness, privacy concerns, trialability, relative advantage, interaction

cultivation, and organizational support.

CHAPTER 4: RESEARCH METHODS

This study adhered to a mixed-methodology approach that allowed for deeper exploration of this relatively new research area. The triangulation of quantitative and qualitative findings also provided studier support for implications and generalizations (Kohlbacher, 2006). Chapter 4 details the methods and procedures employed, including design and sample selection, data collection, and analysis procedures.

Research Design Summary

The mixed-method approach expands upon the current knowledge with input from both quantitative and qualitative data sources. The quantitative and qualitative data each provided insight to address the research question and hypothesis. Analysis of the data followed an embedded design with the qualitative data provided support and explanation for the quantitative findings. Meaning, the two data sets were assessed independently, and then triangulated for likeness before conclusions were drawn. The quantitative method derived a single data source using a survey for data collection. The qualitative portion of the methodology included two data sources, the qualitative survey questions and the expert informants testimony. This inquiry serves as a preliminary investigation with data collection form a single point in time. In other words, the design is also cross-sectional and exploratory in nature.

<u>Justification of Selected Design</u>

Research methodology and design should match the intentions and ambitions of the study. Published accounts benefits observed from social media adoption in healthcare range from patient accountability, to time and money savings (Dyson, Shave, Fernandes, Scott, & Hartling, 2017). These studies do not examine the behavior behind what drives adoption of social media as a new tool for existing tasks, such as patient communication and engagement. This study follows up on the suggestion from the reviewed literature, to verify and identify factors influencing clinicians' use behavior (Dyson et. al, 2017) (Samalihodzic, Hooijsma, Boonstra, & Langley, 2016). Therefore, the design and methodology applied aid in exploration of the topic, explanation of the selected variables, and direction for future studies.

Mixed-Methods Approach

Incorporating both quantitative and qualitative methodology into one study offers a broader perspective on the research topic (Creswell & Clark, 2018). A mixed approach allows the researcher to use all approaches available to investigate the research issue, instead of focusing on one type of methodology. The Center for Innovation in Research and Teaching, based out of Grand Canyon University in Arizona, lists six advantages to using mixed-methods summarized below ("Overview of Mixed Methods", 2017):

- Quantitative research is weak in understanding the context or setting in which data is collected. Qualitative research may include biases and does not lend itself to statistical analysis and generalization. Mixed method strategies can offset these weaknesses by allowing for both exploration and analysis in the same study.

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- Researchers are able to use all the tools available to them and collect more comprehensive data.

- The final results may include both observations and statistical analyses. Therefore, the results are validated within the study

- Mixed methods combines inductive and deductive thinking and reasoning.

- The researcher can use both words and numbers to communicate the results and findings and thus, appeal to a wider audience.

- Combining methodologies helps to reduce the personal biases of the researcher.

These advantages fit the study's need for flexibility and broad-scope data collection, along with the ability to collect new data that may offer a novel contribution.

Exploratory, Cross-Sectional, Survey Research

Research topics with small literature pools lend to further exploratory investigations. Exploratory research seeks to gain general knowledge for all subject stakeholders and is a popular method in social research. Exploratory studies seek to identify initial interest points that can lead to more in depth future studies (Babbie, 2013). This study does just that by identifying the significance of each recognized factor.

All data from the survey and interview was collected only once in May of 2017. Survey entries were locked after participants opened the link and submitted their responses. Participants could not re-access their submission to change their response after their survey was submitted. Applications of the findings from this study are not applied beyond the scope of cross-sectional

design. Therefore, final assumptions regarding the significance of the identified factors are limited to the insight and understanding during a single-point in time.

Survey methods allow a qualitative case study to have quantitative measures. Surveys are often used in mixed methodology designs to add triangulation, development, initiation, and expansion to the qualitative data (Greene, Caracelli, & Graham, 1989). Surveys using a Likert scale yield categorical responses that can be quantified. Surveys are also appropriate data collection tools when there is limited secondary data. Additionally, surveys provide direct insight on specific research questions by providing primary data collected with the intent of the study, rather than transforming data that was collected for another purpose (Salant & Dillman, 1994).

Case Study Research

Case studies are appropriate when the goal of the research is to shed light on phenomena, by gaining in-depth information from a single person, event, group, or institution (Ruzzene, 2012). Research investigations of contemporary phenomenon are well-suited for case study designs. Mixed-methodology is often paired with case study research, allowing the researchers to include a variety of data collection tools such as observations, interviews, direct quotes, testing, surveying, among others. Using multiple tools to gauge a case population provides vivid detail and real-life perspective on often complex issues. Case study research offers practical support for theories. In clinical research, case studies have contributed to the creation of new methods and procedures and new applications for existing methods and procedures. A disadvantage of case study research is the subjectivity of the researcher. Ultimately, the

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researcher(s) decide what data is included for analysis and interpret intentions of others, both decisions may come with bias (Tariq & Woodman, 2013).

Case Description

The sample population was pooled from a single institution, identifying this inquiry as a case study. Small and narrow samples from case studies are generally not considered generalizable; however, the mixed methodology and exploratory nature of this inquiry broadens the use of the collected data and uses the results to compare with larger populations. The case institution is a children's hospital located in Florida. The hospital services patients from birth to age 22, many of whom require continuous care for congenital or terminal conditions; though, the hospital offers a full range of specialties and services treating both rare and common conditions. There are 195 inpatient beds and 35 specialty outpatient clinics in the hospital. The case hospital opened in 2012; however, the hospital is part of a large organization that has facilities dating back to 1940.

The case institution does not currently have a policy for the use of social media to engage or communicate with patients; though, associates are not able to access any social media sites from the 'computers on wheels', where the electronic medical records are accessed in each patient room. The hospital's communications department employees a social media specialist tasked with the upkeep of the institution's multiple Facebook pages, Twitter feeds, YouTube channels, and Pinterest boards. The focus of the current platforms is the community. The institution's social media accounts announce and promote local community, hospital, and clinic events, share healthy living tips, and promote current interest in pediatric clinical research. The

current social media accounts are not assigned individual providers nor are they used to communicate or engage with patients individually. Leaders at the case institution were interested in this study's purpose and aim and felt the insight could contribute to its current practice. Agreement on participation was granted with the acknowledgment that all findings from the study would be shared back with the institutional leaders.

Target Population and Participant Selection

Purposeful Selection methods were used to identify the potential participants. Inclusion criteria for survey participants encompassed the following characteristics: employed full-time by the case institution in May of 2017, provided clinical care to patients (clinician), and had an active work email account (case institution assigned). The inclusion criteria returned 505 possible contributors, identified as the target population. The use of multiple data collection methods required corresponding sampling techniques. The qualitative analysis included two samples; the qualitative survey input and the expert informants. The quantitative data came from a single sample, the survey participants; however, quantitative assessment required stricter filtering of usable responses rendering a different sample from the qualitative survey analysis.

Sampling and Recruiting

After the target sample population was identified, the two samples, survey participants and expert informants, required different selection and recruitment techniques. Both recruiting techniques honored the Purposeful Sampling method.

Required Sample Size Power of Analysis

A power of analysis calculation, computed in GPower (v3.0.10), set the minimum required sample for the quantitative analysis. To determine the required sample size, standard values used in social science research were applied for the necessary input variables: power, 0.8, effect, 0.2, and alpha, 0.05 (Trochim, Donnelly, & Arora, 2016). Using the standard values along with the input value of 7 predictor variables (representing the 7 identified factors assessed in the study) the required sample size was set at 42 indicating a minimum of 42 survey responses would be needed to complete the quantitative analysis.

Survey Sample Selection and Recruitment

The survey was distributed to the entire target population. The case institution provided an estimated response rate of 13% based on previous surveys distributed to the same or similar targets. However, only a total of 60 respondents, 11.88%, submitted a survey during the data collection period. Not all surveys submitted were complete. All 60 inputs collected were included in the qualitative assessment. However, to limit statistical miscalculations surveys that were not ≥ 50% completed were not considered in the quantitative analysis. A total of 47 survey responses were acceptable for quantitative analysis, equating to 9.3% of the target population. Despite the lower than anticipated response rate, the sample was adequate and sufficient for statistical analysis. Additionally, demographic data on age, gender, job role, and number of years worked in healthcare, was collected with the survey

The study sample did not restrict job role to a single clinician type. Participants were asked to identify their job role as a means to determine if any specific role is more inclined to

adopt social media over others. Once the 505 potential participants were known, sample recruitment began. The first decision was the survey delivery method. The electronic survey was created in Qualtrics, a survey design too, and could be accessed with an anonymous participation link. The researcher and case organization decided that it would be best if the participation request came from a known internal account, and not the researchers personal or work email. The researcher worked with the case team to create an electronic invite. The participation request email was sent to all 505 clinicians in the target population and came directly from the case organization's company communications account and was typed on company header. The message noted that the participation was voluntary, anonymous, and for academic research. A second request for participation was sent to the same group 4 weeks after the initial request. The second request generated 30 additional survey participants.

Expert Informant Interviews Sample Selection and Recruitment

The expert informants were also selected using Purposeful Selection methods. Six total participants were selected based on inclusion characteristics of: leadership, stakeholder, co-decision maker on policies implemented at the case institution, and relevancy of job role to subject. The case organization's President, who participated in the interviews herself, identified the members of the group. The five other identified were asked directly by the researcher to participate, all five accepted the request and interviews were scheduled.

Sample Validity

Findings from a non-random, single source sample (case study) has traditionally been considered non-generalizable by researchers. However, new paradigms in social science refute the notion that case studies do not provide common insight (Mahoney, 2007). Woolcock (2013), a researcher out of Harvard Kennedy School of Government, explains how case studies are a key methodology in social science. Woolcock states that case studies provide the ability to draw causal claims and generate testable hypotheses within social and qualitative research; and that the focus of case studies is to explore and explain social mechanisms. Identifying what works for whom, when, where and why, from the input of those who are directly impacted gives the researcher honest, insider knowledge that cannot be obtained with other research methods (Sanjari, Bahramnezhad, Fomani, Shoghi, & Cheraghi, 2014).

Instruments

The survey tool was created using validated measures of each factor identified within the HSMA. The measures used were previously validated by theory and prior studies. Full detail of the survey's measures, questions, and references are found in Appendix C. The survey was a total of 37 questions. Before the survey was distributed, the expert informants reviewed the content and flow to ensure participants were clear on what each question asked, and that the effort to complete the survey was reasonable.

Data Validity

It is important to acknowledge the survey responses are self-reported accounts, submitted anonymously. Therefore, the collected data is assumed true and reasonable by the accounts of professional healthcare workers. Additionally, coverage error, measurement error, and non-response error were all considered before the survey was distributed and the appropriate counter-measures were applied (Salant & Dillman, 1994). Coverage error was minimized since the case institution provided the email distribution list and ensured only associates with active accounts meeting the inclusion characteristic. However, some associates may not check their email regularly; therefore, the reminder email was sent during week four which enhance the chance the invite was seen. Measurement error was concern. Likert scales allow for quantifying of opinions but also leave room for personal interpretation. However, the survey questions were designed to be as unambiguous as possible so the response choices were less subjective. Last, nonresponse error was countered with elimination of any demographic group that was not representative in the sample, labeled as an outlier. The full survey can be found in Appendix B.

Informed Consent

All participants signed an electronic informed consent document before participating in the survey and interviews. The consent form acted as a qualifier for participation in the survey. After clicking the anonymous link, participants had to e-sign and agree to the terms of consent before they could access the survey questions. Interview participants acknowledged agreement to the terms of participation before the researcher began recording dialog. No personal health information or personally identifying information of participants, nor patients, was requested or

collected. All surveys were anonymous. A copy of the informed consent document is included

in Appendix C.

Quantitative Procedures

The qualitative procedures represent the first portion of the study and detail the data

collection and analysis of the quantified survey questions (questions presented with Likert scaled

responses).

Quantitative Data Collection

The electronic survey tool was created using Qualtrics survey builder. Qualtrics also

generated anonymous survey links that were sent in the request for participation emails allowing

contributors to access the created survey. Upon completion of the survey, the submitted data

was stored on the researchers Qualtrics account. The data continued to accumulate during the

open participation period, May – June of 2017. When the survey participation period ended, the

data was extracted via the Qualtrics export feature to a SPSS data file. The exported file was

uploaded into SPSS to begin data cleaning and analysis, discussed in the next sub-section.

Description of Quantitative Data and Measures

The quantitative variables were established by previous research recommendations,

healthcare and behavioral theories, and the relevancy to the research topic. The survey questions

captured multiple measures for each of the factors: privacy concerns, perceived ease of use,

perceived usefulness, relative advantage, trialability, organizational support, and interaction

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cultivation. Actual use of social media to engage and communicate with patients served as baseline data for the sample and was also collected with the survey. Table 4.1 outlines the variables and validated measures and can be found in Appendix

The survey responses were formatted with a 7-point Likert Scale, ranking each measure with a weighted response.   The weighted Likert Scale was coded 1-7 with 1 representing the "strongly opposing" opinion, and 7 representing the "strongly agreeing" opinion. Table 4.1 also includes the measures for the dependent variable, behavioral intent. The dependent variable is the outcome of adoption choice; expressed initially with the 7-point Likert Scale, but was transformed to a binary variable during data analysis. Details of the dependent variable transformation is presented in Chapter 5, Data Transformation subsection. Finally, the survey collected demographic data. Information on age, gender, job role, and number years worked in healthcare were collected and categorized to review sample representativeness. The demographic data and categories for each are explained in Table 4.2 also found in Appendix B.

Data Cleaning and Coding

The survey data was first scrubbed, then coded. Any submissions less than 50% complete were not included for analysis. Additionally, any outliers identified by SPSS exploration were also disqualified. The collected raw data was formatted with Likert Scale and Yes/No responses that auto-translated to numeric codes within. However, the auto-code was reverse of the positively stated survey questions (Sauro, 2011). Thus, the survey responses were re-coded to reflect the proper ordinal notation before analysis began. Additionally, the three

qualitative survey questions (1, 2, and 37) were extracted from SPSS and excluded from the quantitative analysis.

Quantitative Data Analysis

Before analysis, parameters for the statistical significance level were set. Going with general research standards, α value was set at .05. The analysis started with assessment of the sample, followed by transformation of the raw scored, constructs to mean value variables. The mean value variables, along with the dichotomized dependent variable, were assessed for reliability using Cronbach's Alpha. The variables all cleared the test and descriptive statistics were calculated. After reviewing the descriptive data to ensure the data scrubbing and coding was thorough and intact, initial regression assessments for logistic regression assumptions were completed. The assessment of the assumptions revealed the dependent variable was heavily skewed; therefore, to create more even groups for analysis a logistic regression model was chosen for the final computation. The binary logistic regression for the model was evaluated using the R^2 result. Each variable in the equation also produced a significance value with the models R^2 outcome. The following subsections detail the procedures for each of the qualitative analysis steps. The results of each procedure are detailed in Chapter 5, Qualitative Analysis.

Sample Analysis

The sample was assessed for size sufficiency using GPower software to calculate the power of analysis, see Sample Procedures for details. The settings selected were for F tests, multiple regression, a priori – calculate the required sample size given alpha, power,

and effect size. The inputs were set to: $\alpha = .05$, $\beta = .8$, $f^2 = .2$, with 7 predictor variables (later reduced to 5 but this did not change the required sample size, Chapter 4, Quantitative Analysis discuss the details of this change). Once the sample size was verified, demographic frequencies and generalizations were identified, including comparison to National statistics for prevalence of healthcare job roles.

Descriptive Statistics

Descriptive statistics for all survey questions were computed. Mean values and frequencies were especially examined to assess if any factors stood out as skewed and to get a sense of where the data analysis was heading.

Mean Value Variables

Before the analysis could advance to a more robust procedure, each measure for the overall constructs (privacy concerns, ease of use, usefulness, organizational support, interaction cultivation, relative advantage, and trialability) were averaged, per construct, to create a single representation for each respondents "mean-opinion" towards the factors as influencers on behavioral intent. The corresponding measures were averaged by adding the raw score for each measure, then dividing by the number of measures for the construct. These computations created new mean valued variables, a single reference, per construct, per respondent.

Cronbach Alpha

Cronbach's Alpha was computed for each construct ensuring the measures were consistent. The overall model was also assessed to gauge if the selected variables were all measuring the same dimension, behavioral intent. Values are expected to be $\alpha > .7$ to pass the reliability test.

Descriptive Statistics Part Two.

Descriptive statistics were ran a second time, for the mean value variables only. The descriptive statistics are presented in the Chapter 5 Findings, under Quantitative Analysis. The means values shown for these variables are the mean of the means, now representing a single numeric for each factor. Frequencies were also computed for response distribution analysis.

Logistic Regression Assumptions

Test for logistic regression assumptions were completed and cleared before the regression was imitated. These tests included power of analysis for sufficient sample size (already completed), correlation matrix and variance inflation factor analysis for multicollinearity, and residual assessments with plot analysis for identifying any remaining outliers. Details of the assumption test are in Chapter 5, Regression Assumptions. The results from assumption testing altered the original equation in two ways. First, the dependent variable, Behavioral Intent, was highly-skewed with most responses indicating no intent to adopt social media. To mitigate the skewness, the responses were divided into two groups attempting to make each more alike for analysis. Second, the factors identified as "attitudes towards use" were

combined into a single variable. The variance inflation factor analysis revealed the three variables loaded as one. Full details of these changes are presented in Chapter 5. Once all assumptions passed, the data was ready for the regression analysis.

Binary Logistic Regression Analysis

The binary logistic regression analysis included the dichotomous dependent variable (behavioral intent) and the five remaining scaled independent variables (privacy concerns, organizational support, ease of use, usefulness, and attitudes). The output includes R^2 results, were values closest to 1 are desired implicating the variables in the equation fully explain the variance found. The regression also includes an output for the significance of each independent variable in the equation. Significant values, $p < \alpha$, indicate the factor identified does have impact on the behavioral intent of clinicians to adopt social media for patient engagement and communication.

Qualitative Procedures

The qualitative procedures utilized data collected form the survey and expert informant interviews. The data was assessed using different techniques from the quantitative data, but applied like coding where it was appropriate to make triangulation easier during the final phase of analysis.

Qualitative Data Collection

Input from the interviews was collected first hand from the researcher. The experts had two tasks. The first was to evaluate the survey tool and provide feedback. The experts each received an electronic copy of the survey, in a word document, not linked to the electronic Qualtrics surveys that were distributed, for review. Feedback on the survey design, length, and clarity was all positive and only minimal changes to wording were made.

The second task was an open dialog response to two prompts. Via a conference call, the researcher prompted each participant with the following questions:

- What factors do you feel are most influential on a clinician's decision to adopt social media for patient engagement and communications?

- Why do you feel [factor participant stated from first prompt] is influential on clinicians' decision to adopt social media for patient engagement and communications?

While each participant responded, the researcher took notes on the dialog. At no time did the researcher add additional commentary or prompts during the interviews. The collected data was categorized in excel and coded for analysis. Additionally, the three qualitative survey questions (1, 2, and 37) that were extracted from SPSS were entered in to Excel, to prepare for analysis.

Qualitative Data Cleaning and Coding

Responses from each participant were recorded in an excel spreadsheet (same workbook as the extracted survey questions), delineated by each participants ID. The response to the first prompt, what factors do you feel are most influential on a clinician's decision to adopt social

media for patient engagement and communications, was analyzed for key terms, and coded with

a numeric representation for "most influential factor". Any secondary factors mentioned in the

response was also coded. The coded responses and interview notes were saved for later

comparison with the quantitative findings. The final coding for identified influencing factors are

represented in Table 4.3.

Table 4.3: Influencing Factors Coding

Identified Influencing Factor
Privacy Concerns
Policy
Integration/Workflow
Organizational Support
Data Validity
Security/Cybersecurity
No Knowledge/Unaware of Benefits
Unprofessional

The coded data was inspected for any errors of accidental elimination or inclusion,

miscoding, missed data, and scale before continuing to analysis.

Qualitative Data Analysis

By using the numeric coding assigned to the identified primary influencer, frequencies

were tallied for the 7 categories. Further investigation using theme mapping was completed to

identify 4 main data themes from the 7 categories. Chapter 5, Qualitative Data Themes, presents

the theme mapping evolution for the qualitative data analysis.

Data Aggregation for Triangulation and Final Analysis

To complete the analysis, the quantitative and qualitative findings were compared, contrasted, and summarized. First, the data was compared to find likenesses and differences in the sample. Then, the identified primary influencers were compared with the significance of the variables in the equation. After, the qualitative inputs were tied to like quantitative measures to broaden the understanding of the measured factor. The results were then tied back to the HSMA to conclude the analysis. These findings are presented in Chapter 5, Quantitative and Qualitative Data Comparison and Summary of Findings.

CHAPTER 5: FINDINGS

The data exploration exhibited in this chapter represent the results from the case subjects' expert informant interviews and survey responses. A brief dialogue on the researcher and case institution affiliation opens the chapter before diving into presentation of the findings. The analysis starts with an evaluation of the sample population for both the survey participants and the experts, followed by individual analysis of the quantitative and qualitative findings. The chapter closes with a comparison between the quantitative and qualitative outcomes, and finally a summary of all findings.

The Study and the Researcher

The primary researcher is a current employee at the case organization in the Information Systems department. The topic of social media use in healthcare has been an interest of the researcher throughout her doctoral studies. Her personal opinion supports the use of social media to engage and communicate with patients, given users follow common sense and HIPAA regulations. Additionally, the researcher is in favor of national guidelines for the appropriate use of social media by clinicians and standards for cyber-security.

Despite the researcher's personal views, the interest in the study was mutual between the researcher and the organization's leadership. The experts assisted and aided in the coordination of the group, instrument validation, and survey distribution. Though the primary researcher is a doctoral student and does not have extensive experience in conducting studies, the guidance of her dissertation committee and the organization's leadership team provided well-structured

guidelines for data collection methods and analysis. The researcher participated in the interviews by providing a prompt for discussion. While each expert informant spoke, the researcher acted only as an observer, taking notes on the conversation. Anonymity of the researcher was preserved outside of the six experts. The case institutions internal communication team electronically distributed the survey to the targeted sample. The electronic invite to participate in the survey did not disclose the identity of the researcher; therefore, there is no indication that the researcher had any significant effects on the participant input.

<div align="center">Description of the Sample</div>

The sample populations had unique characteristics that were considered as a part of the research analysis.

<div align="center">Survey Sample Demographics</div>

The sample demographic variables include age, gender, job role, and the total number of years worked in healthcare. The demographic data revealed that female nurses, with over 10 years of experience provided the highest response rate. The job role category "other" begs for further investigation with a sizable representation within the sample; though, this study did not have the means to drill down on specific job roles reported as "other" during the course of the study. However, based on the qualifying attributes for sample inclusion we know the roles reported as "other" are clinical jobs, worked at the main hospital campus, not specified by the other job categories. Age was well represented across the working age groups. It is not surprising that the younger age groups, those in the prime of working years, have higher

response rates than those over the age of 55. Table 5.1, Survey Sample Demographics

Summary, summarizes the demographic data. Note: some response categories from the survey

are combined in Table 5.1 to present the data more succinctly.

Table 5.1: Survey Sample Demographics Summary

Measure	Response	% of Sample
Age	25 – 34	32
	35 – 44	26
	45 – 54	23
	>55	19
Gender	Female	77
Job Role	Nurse, ARNP, & PA	30
	Medical Clerks and Technicians	12
	Therapist	21
	Physician	13
	Other (including Pharmacist)	23
Years in Healthcare	2-5 years	23
	6-10 years	21
	Over 10 years	55

Survey Sample Considerations

Often healthcare organizations survey their associates to gauge various business and

clinical indicators such as job satisfaction, employee engagement, and safety. The case

organization was amid a series of mandatory surveys during the same period the study's survey

was distributed. The initial distribution occurred on May 10, 2017, only 1 week after three

company mandated surveys were distributed to all associates in the organization. Following

Dillman's best practice (2006), an electronic reminder was sent on June 5, 2017 to remaining

potential participants – those who had received but yet to respond to the initial request sent on

May 10. Nonetheless, the final count of responses remained meager. A total of 89 surveys were

started, 60 completed and utilized for qualitative analysis, and only 47 responses conclusive

enough for quantitative investigation. The researcher proposes that survey fatigue and volunteer

participation (compared to the mandated surveys sent) likely contributed to the low response

rate. It is unknown if more respondents would produce a different outcome; however, a larger

sample may have shifted demographic stats, job role prevalence, and both quantitative and

qualitative inputs.

Expert Informants Demographics

The second sample for the qualitative analysis were the experts' interviews. The group

consisted topic stakeholders within the case institution. All participants were also full-time

associates within the organization, but not all participants worked a clinical job role. The

President of the case hospital selected the expert contributors. The participants were key

decision makers and stakeholders for the case institution and held a variety of job roles. The

Social Media Manager, Communications Manager, a RN Leader, a Patient Care Services Leader,

and a Clinical Data Security Specialist each had a different and valuable perspective to offer the

inquiry. The experts work as co-decision makers on policy implementations at the hospital and

would need to collaborate for any new policy that resulted from the study's findings. Table 5.2

presents a summary of the experts' demographics and includes the data coding for later

assessment.

Table 5.2: Expert Informants Sample Demographics Summary

Participant ID	Gender	Job Role	Experience
1	Female	President	>10 years
2	Female	Social Media Manager	2-5 years
3	Female	Communications Manager	6-10 years
4	Female	RN Leader	>10 years
5	Male	Patient Care Services Leader	>10 years
6	Male	Clinical Data Security Specialist	>10 years

Sample Generalizations for External Validity

To aid in the generalizability of the findings, an analysis of the sample population compared to the reported national population of clinicians was compared. As 2014, the United States Department of Labor (US DOL) reported that RNs had the highest employment rate of all healthcare occupations, representing 23% of the total healthcare labor force and nearly 36% of clinical occupations (Bureau of Labor Statistics, 2015). The US DOL data is not pediatric specific (no known data source for pediatric specific parallel), but it does provide a comparison for generalizability. The National Council of State Boards of Nursing published in their National Nursing Workforce Study that only 14% of working RNs are male, and that the population of RNs over the age of 50 is diminishing as the younger generation ramps up (NCSBN, 2015).

The general distribution of job roles also aligned with national population statistics. The US DOL published a report, the 2016 Occupational Outlook Handbook, that provided the prevalence of clinical job roles among all clinical health care jobs (https://www.bls.gov/ooh/),. The US DOL data was compared with the sample statistics to assess generalizability of the sample population to the national population.   Medical clerks and technicians, and therapist job

roles within the sample vary greatly from the national population. However, both categories are

actually comprised of many job roles in both the sample and the national population reports.

When narrowing down the medical clerk and technician category to only medical and surgical

technicians, both the sample and national population report a 6% prevalence. Therefore,

assuming the complete combination of included job roles for the skewed categories are not 100%

equivalent, the variation in contributing job roles creates the misalignment. Table 5.3 outlines

the job role prevalence for the sample and national population.

Table 5.3: Job Role Prevalence

Job Role	Prevalence in Sample (%)	Prevalence in National Population (%)
Nurse, ARNP, PA	30	27
Medical Clerks and Technicians	12	34
Therapist[1]	21	7
Physicians[3]	13	6
Other [3] (including pharmacist)	23	26

1. US DOL data included Physical, Occupational, Respiratory, Speech, and Behavioral Therapists

2. US DOL data included all physicians and surgeons

3. For US DOL comparison "Other" is the remaining percentage (of 100% representation) of clinical occupations

Quantitative Findings

The research question provides the framework for the investigation and a basis for the

application of the findings. The research question is:

RQ. Which factors influence pediatric clinicians' behavioral intent to adopt Social Media

for engaging and communicating with patients?

In response, all 47 usable survey responses were utilized in the quantitative analysis. For

each identified factor, an assessment of the corresponding, aggregated measures provided

determination for the research hypothesis, shown in Table 5.4. The quantitative evidence

reflected only one significant factor in the equation, privacy concerns. This result indicates none

of the other factors considered in the equation create a great enough concern among the

participants to impact their behavioral intent.

Table 5.4: Summary of Hypothesis and Results

	Hypothesis	Results
H_0	None of the factors impact Behavioral Intent of pediatric clinicians' to adopt Social Media to engage and communicate with patients	Reject
H_1	Perceived Usefulness will significantly and positively impact Behavioral Intent	Reject
H_2	Perceived Ease of Use will significantly and positively impact Behavioral Intent	Reject
H_3	Interaction Cultivation will significantly and positively impact Behavioral Intent	Reject
H_4	Relative Advantage will significantly and positively impact Behavioral Intent	Reject
H_5	Trialbility will significantly and positively impact Behavioral Intent	Reject
H_6	Organizational Support will significantly and positively impact Behavioral Intent	Reject
H_7	**Privacy Concerns will significantly and negatively impact Behavioral Intent**	**Accept**

Data Transformations

After the initial assessment of the quantitative data, additional data transformations were

deemed necessary for further investigation.

Dependent Variable Transformation

Initial exploration of frequencies for the quantitative data set exposed issues with

distributions for the dependent variable, Behavioral Intent. The mean frequencies, expressed as a

percentage of the sample population, for each response category measuring Behavioral Intent

revealed over 58% of the respondents indicated no intent to use social media for patient engagement and communication (Likert Response of Extremely Unlikely). Only 10% of respondents indicating at least some intent interest (Likert Responses of Somewhat Likely, Moderately Likely, and Extremely Likely). Researchers have argued that parametric test should not be used with Likert Scaled data sets due to the complications created when ordinal data is transformed to numbers and must be treated as interval data. These transformed data sets often violate the parametric test assumptions, such as normalcy. Best practice for Ordinal and Multinomial regressions assume relatively even frequencies between the dependent variable categories to produce a viable equation. However, robust statistical testing using transformed Likert data sets has been successfully applied in many studies within medical and social science research despite displaying extreme violations of normal distribution (Sullivan & Artino, 2013).

A robust, parametric test with a skewed dependent variable may have proved accurate, but the small sample size increases concern for bogus results. Reducing the number of categories, meaning consolidation of groups, is a solution that mitigates the change of erroneous outcomes for smaller data sets. Researchers have thoroughly investigated and tested this type of transformation and highly recommended this procedure for ordinal data sets small sample sizes (Winship & Mare, 1984).

After comparing the options, the research team felt it would be best to transform Behavioral Intent from the 7-point numeric representation of the Likert scale to a dichotomous variable. The transformation divided mean Behavioral Intent response values (1-7) into two groups. The first group represents "No Intent" (values 0-3.5), the second represents "Has Intent" (values 3.6-7). Table 5.5 displays the transformation evolution for the study's dependent

variable. The dichotomous dependent variable is referred to as Behavioral Intent 2 for the

remainder of the study.

Table 5.5: Transformation Evolution of Behavioral Intent (DV)

(DV) Behavioral Intent		(DV) Behavioral Intent 2	
Survey Response (Likert Scale)	Initial Numeric Value Assigned	Dichotomous Value Assigned	Group Description
Extremely Unlikely	1	0	No Intent
Moderately Unlikely	2		
Slightly Unlikely	3 – 3.5		
	3.6 – 3.9	1	Has Intent
Neither Likely or Unlikely	4		
Slightly Likely	5		
Moderately Likely	6		
Extremely Likely	7		

Mean Value Independent Variables

Each survey question represented a validated measure for one of the factors identified in

the equation. Each factor, independent variable, correlated with multiple measures to create the

study's constructs. To create the mean value variables, the data was transformed twice. First, all

measures for each variable were aggregated to create a raw score (sum) value. Then, the raw

scores were transformed to mean values (raw score/number of measures within construct). The

remainder of the quantitative analysis refers to the mean values for all independent variables.

<center>Descriptive Statistics</center>

Among the independent variables, privacy concerns stands out as the strongest contender

for influencing behavioral intent with a mean value of 6.3245. Only Interaction Cultivation

resulted in range of a neutral response. The remained of the variables averaged low. Table 5.6

summarizes the basic descriptive statistics for the variables in the equation.

Table 5.6: Summary of Descriptive Statistics

Variable	Number of Measures	Mean	Standard Deviation	Variance
Behavioral Intent *(Before Dichotomizing)*	2	2.2500	1.81449	3.292
Usefulness	4	2.6404	1.61951	2.623
Ease of Use	4	3.6431	1.75255	3.071
Interaction Cultivation	3	4.1154	1.72118	2.962
Relative Advantage	6	3.3333	1.64716	2.713
Trialability	4	3.7396	1.86368	3.473
Organizational Support	3	3.9167	1.65385	2.735
Privacy Concerns	4	6.3245	1.01204	1.024

Current Use

The quantitative analysis included exploratory and statistical investigations of the thirty-

two scaled survey questions. Two questions aimed to measure current use of social media and

were analyzed separately from the remaining thirty. The results of the current use measures

created a baseline for current use behaviors among the sample population. Measurements for

current use accounted for both personal use and professional use to engage and communicate

with patients. The current use assessment revealed that the large majority of responding

clinicians use social media for personal use, 85%; however, only 6.7% currently use social media

to engage and communicate with patients.

Frequencies for Behavioral Intent 2 and the baseline frequencies for current are compared

in Table 5.7. Current use data illustrates the great majority of responding clinicians, 93.3%, do

not use social media to engage and/or communicate with their patients. However, only 75% of

respondents group into the "No Intent" designation. This evaluation infers some providers may

be interested in adopting social media to communicate and engage with patients. Chapter 6

provides a more detailed discussion on this inference.

Table 5.7: Frequencies of Behavioral Intent 2 vs. Current Use

Measure	Value	Percentage (%)
Behavioral Intent 2	No (0)	75
	Yes (1)	25
Current Use	No	93.3
	Yes	6.7

Cronbach Alpha Test for Reliability

Evaluation of internal consistency was preformed using the Cronbach Alpha reliability

test. Acceptable Cronbach Alpha values, $\alpha > .7$, indicate the measures appropriately measure

what they intend to – this applies to the individual measures within each variable construct and

the independent variables together applied to the outcome variable. The Cronbach Alpha results,

displayed in Table 5.8, indicate adequate internal consistency of the overall model and each

constructs measure.

Table 5.8: Cronbach Alpha Results

Variable	Cronbach Alpha
Behavioral Intent	.969
Usefulness	.958
Ease of Use	.940
Interaction Cultivation	.948
Relative Advantage	.955
Trialability	.921
Organizational Support	.898
Privacy Concerns	.974

Regression Assumptions

After confirming the model and constructs were appropriate, the next data assessment tested for assumptions associated with dichotomous logistic regression analysis followed by the execution of the regression model. The assumptions for logistic regression are no outliers, no multicollinearity, and a significant sample size.

Outliers

No outliers were detected in the variances of the variables or constructs (detailed in the descriptive analysis section above).

Multicollinearity

Based on the correlation matrix, the construct variables for the measure of attitudes (Trialability, Relative Advantage, and Interaction Cultivation) are moderately correlated ($r \geq .7$) among themselves and with the Technology Acceptance measures, Ease of Use and Usefulness. The general rule in research suggest correlation values $r \geq .9$ should be discarded from a single

analysis (Pallant, 2010). None of the correlation values in the equation breach the cut-off value for removal; however, since the elevated correlation values are greater than .7 further examination of the correlations was completed via Variance Inflation Factor analysis. Table 5.9 reports the correlation values for variables in the model.

Tolerance and the Variance Inflation Factor (VIF) expand upon the found correlations. Tolerance values should be greater than .1 and VIF values should be less than 10 when no multicollineraity exists (Pallant, 2010). The data is not displayed in this text; however, the results of the VIF confirmed multicollineraity and identified Relative Advantage as the primary culprit with a VIF value of 10.792 and tolerance of .093. All other VIF and tolerance values were well within acceptable ranges.

To resolve the violations, Relative Advantage was amassed Trialability and Interaction Cultivation to create a compound variable representing all attitude measures (HSMA). The compound variable, named Att_RA_Tri_IC, is represented by the mean value of all measures for each of the attitude variables (Relative Advantage, Interaction Cultivation, Trialability). Factor analysis verified all thirteen measures within attitude appropriately loaded into a single component with a cumulative variance (Eigenvalue) of 73.315%. Therefore, the compound variable was created instead of dropping Relative Advantage, allowing the study to maintain as much of the data as possible while reducing the correlation created by Relative Advantage (Song, Lin, Ward, Fine, 2013).

To ensure the internal consistency was not compromised by the creation of the compound variable, Cronbach Alpha was evaluated for Att_RA_Tri_IC. The reliability of the compound variable confirmed with an acceptable Cronbach Alpha value (.968).

The correlation analysis was repeated using the compound attitudes variable in place of Relative Advantage, Interaction Cultivation, and Trialability. Table 5.10 displays the updated correlation values when Att_RA_Tri_IC is used. All values fell within the acceptable range and the violation of multicollinearity was cleared.

Table 5.9: Initial Correlation Values

Correlation	Usefulness	Ease of Use	Interaction Cultivation	Relative Advantage	Trialability	Organizational Support	Privacy Concerns	Behavioral Intent 2
Usefulness	1.000	.697	.666	.842*	.709	.415	-.331	.680
Ease of Use	.697	1.000	.763	.826*	.714	.551	-.239	.507
Interaction Cultivation	.666	.763	1.000	.867*	.748	.545	-.050	.443
Relative Advantage	.842*	.826*	.867*	1.000	.808*	.446	-.180	.579
Triability	.709	.714	.748	.808*	1.000	.352	-.217	.490
Organizational Support	.415	.551	.545	.446	.352	1.000	-.127	.379
Privacy Concerns	-.331	-.239	-.050	-.180	-.217	-.127	1.000	-.418
Behavioral Intent 2	.680	.507	.443	.579	.490	.379	-.418	1.000

Table 5.10: Correlation Values with Compound Attitude Variable

Correlation	Usefulness	Ease of Use	Organizational Support	Privacy Concerns	Att_RA_Tri_IC	Behavioral Intent 2
Usefulness	1.000	.697	.415	-.331	.789	.680
Ease of Use	.697	1.000	.551	-.239	.820	.507
Organizational Support	.415	.551	1.000	-.127	.478	.379
Privacy Concerns	-.331	-.239	-.127	1.000	-.161	-.418
Att_RA_Tri_IC	.789	.820	.478	-.161	1.000	.538
Behavioral Intent 2	.680	.507	.379	-.418	.538	1.000

Sample Size

The initial sample size analysis confirmed adequacy; however, since the compound variable for attitudes aggregated three variables into one, the number of predictor variables decreased to five. The power of analysis was recalculated using five predictor variables (down from 7) and the same standard values for effect size, alpha, and power. The drop in predictor variables did not change the required sample size (42). Therefore, the assumption for sufficient sample size remains intact.

Binary Logistic Regression Analysis

Subsequent to the satisfactory regression assumption tests, the binary logistic regression was executed using SPSS statistical software. The first outputs, the Hosmer Lemeshow and

Omnibus Tests, explain the goodness of fit. Both tests, shown in Table 5.11, indicate the model

has a good fit with values much greater than alpha ($\alpha = .05$).

Table 5.11: Goodness of Fit Test

Hosmer and Lemeshow Test			
Step	Chi-square	Df	Sig.
1	2.593	7	.920

Next, a review of the models sensitivity and specificity disclosed 94.4% of the outcome

variable was correctly predicted as true; meaning the participating clinician has no behavioral

intent to use social media to engage and/or communicate with patients. The specificity of the

model, 72.7%, indicates the correctness of the predictions for participants with intent to use

social media to engage and/or communicate with patients. Overall, the model correctly predicted

89.4% of behavioral intent correctly. Table 5.12 displays a summary of the sensitivity and

specificity.

Table 5.12: Sensitivity and Specificity of the Model

			Predicted		
			Behavioral Intent 2		Percentage Correct
Observed			No	Yes	
Step 1	Behavioral Intent 2	No	34	2	94.4
		Yes	3	8	72.7
	Overall Percentage				89.4
a. The cut value is .500					

Significance Results

The overall significance values, R^2, are shown in Table 5.13. The Cox and Snell value is based on the log likelihood for the model compared to the log likelihood for a baseline model. However, with categorical outcomes, it has a theoretical maximum value of less than one, even for a "perfect" model. Therefore, the Nagelkerke value is more appropriate for the dichotomous dependent variable used in the study. Nagelkerke R^2 is an adjusted version of the Cox & Snell R-square that adjusts the scale of the statistic to cover the full range from 0 to 1 (Nagelkerke, 1991). The .718 value indicates 71.8% of the variance is explained by the predictors in the model.

Table 5.13: Logistic Regression R2 Values

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	20.734[a]	.476	.718

Last, the independent variables present individual contributions to the model. The results conclude that privacy concerns is the only statically significant contributor to the behavioral intent of clinicians to use social media to engage and/or communicate with patients. Results of the individual variables significance are summarized in Table 5.14. Further discussion on the predictor variable contributions are elaborated further in Chapter 5.

Table 5.14: Variables in the Equation

Variable	B	S.E.	Wald	Sig.
Usefulness	1.027	.674	2.319	.128
Ease of Use	.257	.774	.111	.740
Organizational Support	.499	.402	1.543	.214
Privacy Concerns	-1.110	.531	4.370	.037*
Attitudes	.423	1.148	.136	.712
Constant	-3.409	3.105	1.206	.272

Summary of Hypothesis Testing

The final quantitative results applied to each hypothesis accepts only H_7, with $\alpha < .05$.

- H_0: None of the factors impact Behavioral Intent of pediatric clinicians to adopt Social Media to engage and communicate with patients

    o H_0: Reject

- H_1: Perceived Usefulness will significantly and positively impact Behavioral Intent

    o H_1: Reject

- H_2: Perceived Ease of Use will significantly and positively impact Behavioral Intent

    o H_2: Reject

- H_3: Interaction Cultivation will significantly and positively impact Behavioral Intent

    o H_3: Reject

- H_4: Relative Advantage will significantly and positively impact Behavioral Intent

    o H_4: Reject

- H_5: Trialbility will significantly and positively impact Behavioral Intent

    o H_5: Reject

- H_6: Organizational Support will significantly and positively impact Behavioral Intent

    - H_6: Reject

- <u>H_7: Privacy Concerns will significantly and negativly impact Behavioral Intent</u>

    - <u>H_7: Accept</u>

<u>Qualitative Findings</u>

The qualitative analysis encompassed two sources of data, the open-ended survey questions and the individual interviews with the experts. The responses collected from the survey were assessed separately from the interviews before the data was aggregated to identify commonalities, themes, and connections. Overall, the tone from the qualitative input suggested most clinicians are not yet ready to adopt social media as a means of engaging and communicating with their patients; though, not all respondents were averse to learning more about the benefits of social media as a healthcare tool. The following sections will outline the data collected, the coding, and the analysis of the case qualitative inputs.

Expert Informants

The experts provided two feedbacks. First, they reviewed the survey tool verifying the ease of understanding and acceptable length. The group agreed that the measures in the survey aligned with the study's aims to measure factors that my influence clinicians' behavioral intent, and with "real world" concerns around the topic of using social media to engage and communicate with patients. The group affirmed that electronic delivery to the target sample would be the best method to request participants. Sending an electronic link would allow

potential respondents to reply at a time most convenient to them, and would not interrupt their

workflow during on-shift hours. The group did suggest and extension of the open period for

participation beyond the original four-week plan. The suggestion was based on their knowledge

of three organizational, mandatory surveys also planned for distribution, to the same group of

participants, during May of 2017. The participation period was extended, though the low

response rate suggests the concern that potential participants would have survey fatigue and

choose to not participate in this study was not fully mitigated by the extended participation

period. Second, the group provided their opinions on the topic of social media use for patient

engagement and communication. Key thoughts from the two prompts were collected and coded.

The two prompts given were:

- What factors do you feel are most influential on a clinician's decision to adopt

  social media for patient engagement and communications?

- Why do you feel [factor participant stated from first prompt] is influential on

  clinicians' decision to adopt social media for patient engagement and

  communications?

The participant IDs were assigned in the order the conversations took place and do not have

any ranked values. The number of years worked in healthcare and job role types were assigned

for comparison with the survey data that collected demographic information on job role. The

greatest influencer was coded based on the participant's response to prompt one, and any

secondary factors mentioned were also noted and recorded to maintain as much data given as

possible. The second prompt asking why a particular factor was founded to be most influential

was recorded as quotes and not coded for comparison; rather, kept as qualitative detail

information. Results of the expert informants coding are outlined in Table 5.15.

Table 5.15: Expert Informants Coding

Participant ID		1- President 2- Social Media Manager 3- Communications Manager 4- RN Leader 5- Patient Care Services Leader 6- Clinical Data Security Specialist	
Data Requested	Data Collected	Participant ID	Code Given
Years in Healthcare	2-5 years	2	Less Experienced
	6-10 years	3	Experienced
	Over 10 years	1, 4, 5, 6	Most Experienced
Job Role Category	Nurse, ARNP, PA	4, 5	RN
	Other	1, 2, 3, 6	Other
Primary Influencer	Policy	1, 2, 5	Policy
	Integration/Workflow	3	Integration
	Data Validity	4	Validity
	Security/Cybersecurity	6	Security
Secondary Influencer	Policy	6	Policy
	Integration\Workflow	4	Integration
	Security	2	Security

The key thoughts from each participant along with the assigned code(s) for primary and

secondary influencers are listed in Table 5.16. The assignment of the influencer codes was based

on the key thought statements. The key thoughts displayed are from direct quotes the participants

stated during the data collection process, but was paraphrased where appropriate.

Table 5.16: Experts Key Thoughts and Influencer Codes

ID	Key Thought	Code
1	Social Media has a place at [in healthcare] though it may not be at the provider level…rather, as an organization, it is important to have a social media presence. I am interested to see how pervasive the desire is to use social media to engage and communicate with patient..	Policy
2	Social media is a great tool to engage and communicate with patients… [however] the health care industry at large does not have enough policy or support in place to safely allow clinicians to discuss personal health matters via social media… I would support the use if we had the appropriate resources to guide the way. I also think clinicians should have professional pages/profiles that are completely separate from personal pages/profiles and that governing bodies could access the pages if needed.	Policy/ Security
3	We [Case Study Hospital] use social media all the time to engage and communicate with the community as an organization! It works great to get the information out there. I am not sure if clinicians will be receptive to new methods of engagement or communication, but the idea has potential; especially if there is a way to integrate use with our current engagement and communication methods.	Integration
4	The idea makes me uneasy. I do not think that all clinicians should be communicating with patients, regardless of the medium. There needs to be a source of truth for the information patients receive, especially for adolescent patients and their guardians. If a patient has multiple providers, communicating multiple ways, it may create confusion.	Validity/ Integration
5	Having a social media presence is good for the organization and patients; it's necessary. Many people use social media to obtain information about locations, provider specialties, assistance, and events… I recognize the potential benefits, especially for our older [teen] patients. Teens are glued to phones, tablets, or TV screen… social media could be a good way to reach them. How would we…start a program like this though? Where do we begin?	Policy
6	Major security concerns! Social media is vulnerable to data breaches that could compromise patients and providers. Beyond policy, physical and digital cybersecurity measures would be essential if the intent is to exchange any patient health or financial information. I would not want clinicians to use personal social media accounts…or access of site.	Security/ Policy

Survey Responses

Qualitative responses collected from survey questions one, two, and thirty-seven

collected direct input data from the survey participants. To obtain and conserve qualitative data

input, 60 responses that contained qualitative responses were used in the qualitative analysis.

Half of the survey respondents reported privacy concerns as the most influential reason for not

choosing to use social media to engage with patients. Many responses specifically mention

HIPAA (the Health Insurance Portability and Accountability Act) within their privacy

statements. However, half of those who identified privacy concerns as the most influential factor

on their intent, indicated apprehensions about their own privacy preservation, a new detail for

privacy concerns. The first analysis of the qualitative survey data was individual contemplation

of each response for the three qualitative questions. Looking at inputs as independent thoughts

helped to create parameters for variety and anticipated response trends within the data set, and

prepped the data for accumulation with the interview inputs.

Qualitative Survey Coding

The data collected from survey questions 1, 2, and 37 was coded per question to identify

redundancy in the responses. Tables 5.17, 5.18, and 5.19 provide question details, coding, and

frequencies for the survey questions 1, 2, and 37, respectively. Question 1 reveals that very few

clinicians are currently using social media to for patient communication and engagement.

Question 2 inquires about the most influential reason why a participant does not use

social media to engage or communicate with patients. Responses to question 2 were coded using

the same categories as the key inputs from the experts (with additional categories added where

appropriate). Sample responses for each category is included in Table 5.18. These responses

were used to guide the coding categories for primary influencers. Nearly 32% of respondents

reported privacy concerns as their most influential reason for not using social media

professionally. Unprofessionalism also ranked high at 26%, followed by policy at 16%.

Question 37 requested input on final thoughts, presented at the end of the survey. Table

5.19 presents a selection of comments that provided extra insight to the data discovery. The

responses from Question 37 initiated the evaluation of all codes collaboratively, discussed in the

next section.

Table 5.17: Qualitative Survey Question 1

Which Social Media websites do you currently use to engage with or communicate with patients?	
Response Category	Frequency
None	56
Facebook	4

Table 5.18: Qualitative Survey Question 2

What is the most influential reason as to why you don't choose use Social Media to engage with or communicate with patients?		
Response Code	Sample Response	Frequency
Privacy Concerns	Accidental privacy violation or potential for patient to encroach on my personal life via social media	18
Unprofessional	I do not feel social media is appropriate for use by a professional. Personal communication is always the best method to deal with patients	15
Policy	Legal and HIPPA concerns	9
Organizational Support	I have not been instructed or been permitted to how and why to use social media	6
Security/Cybersecurity	PHI security. Social media is not secure (data encryption)	3
Integration/Workflow	It would be one more thing on my plate to add to my already busy work schedule	2
Data Validity	Concerns for taking things out of context or not knowing the entire medical issue at hand	2
No Knowledge/ Unaware of Benefits	Never has been my practice. It is not that I would not choose Social Media but no one has ever shared the benefits of this form of patient communication	2

Table 5.19: Qualitative Survey Question 37

	Do you have any final thoughts regarding social media use for engaging or communicating with patients that you would like to share?
Code	Sample Response
Privacy, Unprofessional	"I worry about confidentiality issues, saying something that should be kept confidential. Also the word "social" implies a personal relationship, and in most cases that is considered "crossing the line" of the provider-patient relationship."
Privacy, Policy	"Slippery slope. Starts to invade personal life quickly. Requires a lot of upkeep and can be at odds with HIPAA and hospital legal counsel."
Security/Cyber-Security, Privacy	"I am hesitant to use social media to communicate with patients. I am very concerned that information could be misdirected accidentally or outright stolen and then [Case Study Hospital] as well as me would be liable. Also, when I am not at work, I do not discuss my job with the community. I do not believe I would appreciate the intrusion of my work life into my personal life."
No Knowledge/ Unaware of Benefits, Unprofessional	"I think the name explains the idea, "social media"; but in healthcare the human touch is important, the human interaction is what makes our roles so vital and important to our patients, and there is no social media application that will replaced that. We are not in the business of shoes, clothes or telecommunication in which social media will be an essential tool."
Organizational Support	"I have not been instructed or been permitted to how and why to use social media"
Policy, Organizational Support	"I am fearful of HIPPA and my organizations lack of support for social media communication"

Pediatric Concerns

The results of the qualitative analysis frame a clear understanding of how privacy concerns influence clinicians' intent to use social media to engage and communicate with patients. Few inputs touched on pediatric specific ideas; one in particular was an account of a personal experience where social media was inappropriately used to by a patient's mother:

"…Social media can enhance access to health care workers, but it can also invade and interrupt their work and private lives. I had a mother whose child was removed from her custody due to concerns of child abuse. She used social media in a campaign against me,

and I could do nothing about it due to HIPAA. She blamed me for her child being taken

away. This resulted in me receiving death threats as well as other members of the

treatment team for this child. These people from across the country targeted me in

various ways on social media. The effects of this have lasted more than 3 years."

This account may be unique to pediatric care, though the idea that patients' loved ones

can access clinicians through social media brings new concerns to light such as identity

validation, the protection of personal accounts, and cyberbullying. Overall, the foundation for

each influencing reason mentioned is privacy. Privacy for data, people, and safety.

Qualitative Data Themes

In total there were 8 identified categories (Privacy Concerns, Policy,

Integration/Workflow, Organizational Support, Data Validity, Security/Cybersecurity, No

Knowledge on Benefits, and Unprofessional to Use) found in the qualitative survey responses.

An analysis of overlapping thoughts and inputs uncovered four data themes. The process of

consolidating from coded data categories to data themes are visualized in Figure 5.1, which

shows connections between the categories and how they interrelate. The categories Privacy,

Security, and Data Validity all had similar concerns were consolidated as a single theme,

Privacy/Cybersecurity. While there is a difference between data breaches (cybersecurity), a

nosey patient (clinician privacy), and messages taken out of context or the ability to confirm

identity (data validity), all 3 categories related to the preservation of the patient, clinician, and

sensitive information for both. Policy is the next theme. Policy from governing bodies and from

individual organizations to provide directions and parameters for proper use cases and to protect

personal space and information. Support is a theme tied to policy, but also encompasses support

workflow integrations, proper marketing, and knowledge transfers on benefits of use. Last,

Professional Perception was created as its own theme. Perception is subjective, but from

analysis of the responses, could be swayed if firmer parameters for use and support were

established. Without guidelines for proper use, executing use of social media is left to individual

opinions on professionalism. Assuming privacy and security issues could be resolved with

policy and support, perhaps clinicians would no longer view social media as an unprofessional

means for engagement and communication. Additional thoughts on the data themes follows in

Chapter 6.
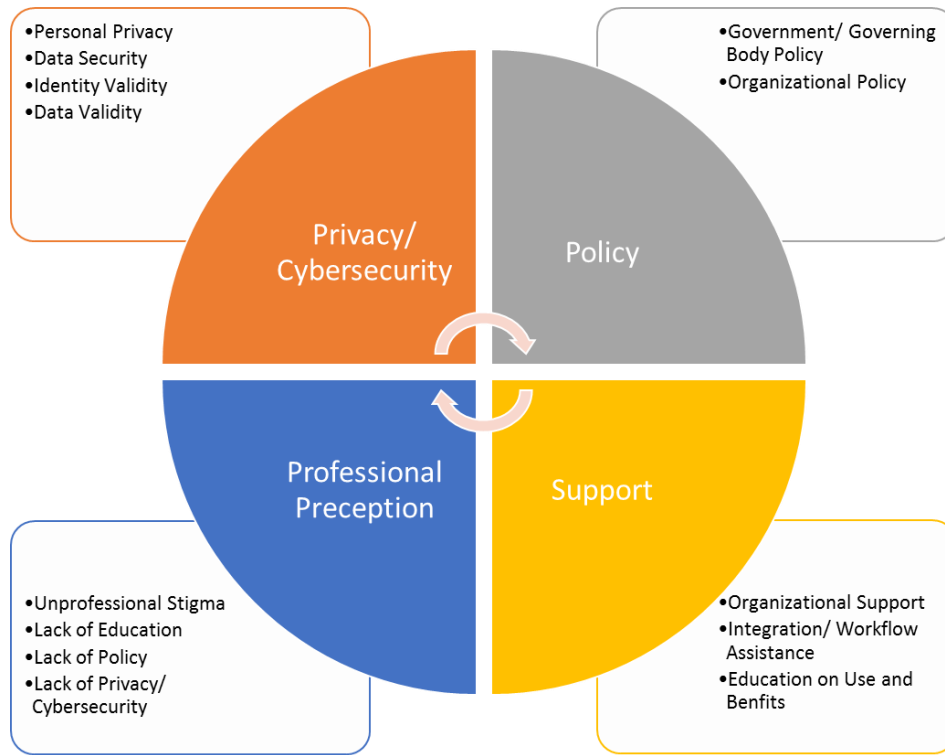
Figure 5.1: Qualitative Data Themes

Quantitative and Qualitative Data Triangulation

The qualitative findings align with and bolster the quantitative results. The quantitative analysis ultimately measured 5 variables as potential influencers: usefulness, ease of use, organizational support, attitudes, and privacy. The qualitative data generated a total of 8 categories: privacy, policy, integration/workflow, validity, security/cybersecurity, lack of knowledge, organizational support, and unprofessionalism. The variables and categories related well from a high-level analysis. Figure 5.2 compares the quantitative variables with the

qualitative categories by creating a crosswalk analysis to the overarching data themes. The

crosswalk between the variables and the categories provides a complete view of all data collected

during this study.

Quantitative Factors
- Privacy

Qualitative Categories
- Privacy
- Organizational Support
- Policy
- Integration/Workflow
- Data Validity
- Security/Cybersecurity
- Lack of Knowledge on Benefits
- Professionalism

DATA THEME: PRIVACY/SECURITY
Factors relating to the preservation of the patient, clinician, and sensitive information
- Privacy
- Data Validity
- Security

DATA THEME: POLICY
Factors relating to use: who, what, where, when, and why
- Policy
- Usefulness

DATA THEME: SUPPORT
Factors relating to education and resources
Organizational Support
Integration/Workflow
Lack of Knowledge on Benefits

DATA THEME: PROFESSIONAL PRECEPTION
Factors relating to individual perception
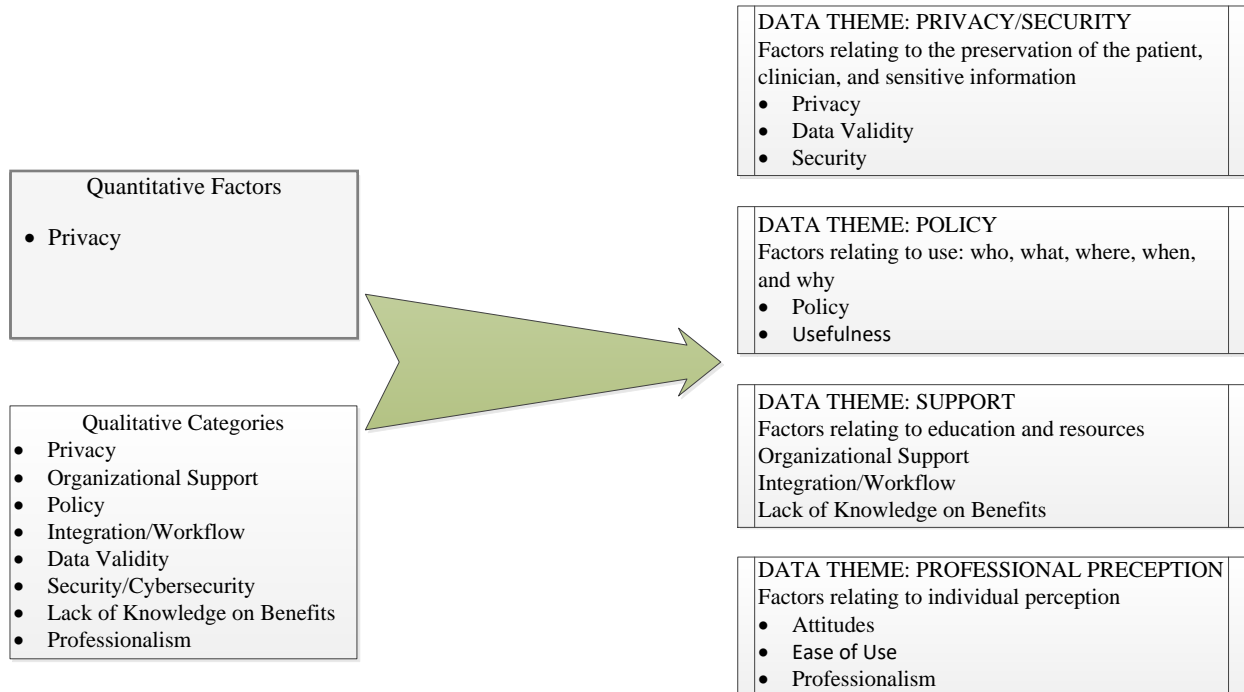- Attitudes
- Ease of Use
- Professionalism

Figure 5.2: Quantitative Variables and Qualitative Categories Crosswalk to Data Themes

Privacy, policy, and security stand out in both data sets. The qualitative data from the

survey confirmed that privacy concerns is the primary influencer on clinicians' intent to use

social media for patient communication and engagement. The survey participants expanded the

understanding and definition of privacy with their qualitative responses, stating the ability to

maintain their own privacy from patients, not just patient privacy and HIPAA regulations, is a

privacy apprehension. Policy was also prevalent in both analyses. Based on qualitative survey

input, Organizational Support are tied to policies and regulations, though the quantitative analysis did not show correlation between the variables. Organizational support did not prove to be statistically significant in the quantitative examination; though, practical significance is recognized from both the quantitative R^2 value and the qualitative feedback. Perceived professionalism and the belief that social media is not a professional tool for patient communication surfaced from the qualitative testimony. Perception may be hard to quantify; however, the feedback suggest opinions of professionalism are based on personal use experiences and current workflow standards, not ethical opposition.

Summary of Findings

Though the response rate was low there was sufficient input to complete the analysis and provide exploratory acumen to the study's inquiry. In summary, the outcome of the quantitative and qualitative analysis concurs, and confirm privacy concerns are the most significant factor impacting clinicians' intent to use social media for patient engagement and communications. With these findings, the null hypothesis was rejected along with hypothesis predicting significant and positive impact from usefulness, ease of use, organizational support, relative advantage, trialability, and interaction cultivation. The qualitative response enhanced the quantitative findings by defining privacy as both patient and provider centric. Attitudes and professionalism proved to be an unexpected find, and may be hard to quantify; however, the need for policy may resolve lingering negative opinions on social media use in healthcare. Last, concerns specific to the case setting (pediatric health care) provoke further investigation for appropriate use cases, trying into cybersecurity issues, online identity validation, and authoritative actions if the platform is misused. Chapter 6 will review the findings in detail with discussion on the strengths

and weaknesses of the study, followed by future study recommendations that emerge from the

findings presented.

CHAPTER 6: DISCUSSION

Findings from this study cannot confirm nor reject the potential benefits of using social media for patient engagement and communication, but it can conclude that the behavioral intent of the sample to adopt is very low. Since validated measures were used and the Cronbach Alpha values were acceptable, further analysis using step-wise regressions may be done in the future.

Findings Applied to the HSMA

The findings from the study are applied within the HSMA for interpretation and implications. Figure 6.1 shows a revised HSMA using only factors from the original model that remained significant after analysis (privacy and usefulness). Figure 6.2 expands the revision to include factors identified in the qualitative analysis data themes (security, policy, support, and perceived professionalism).
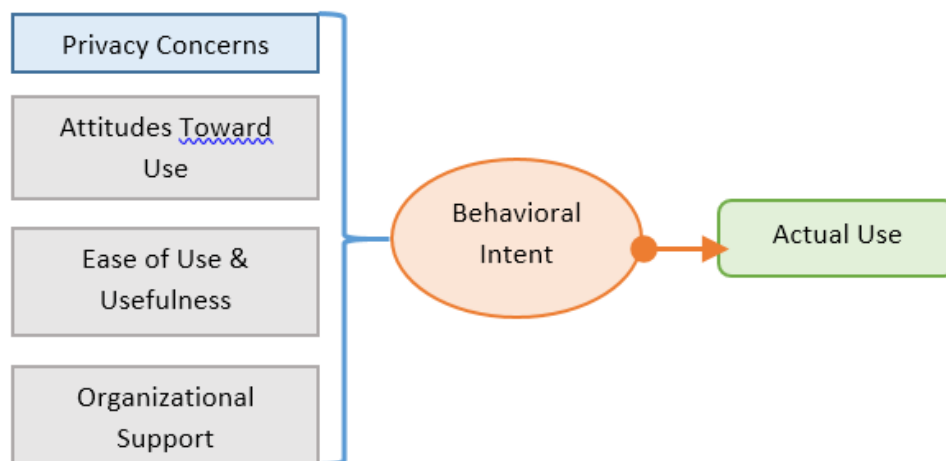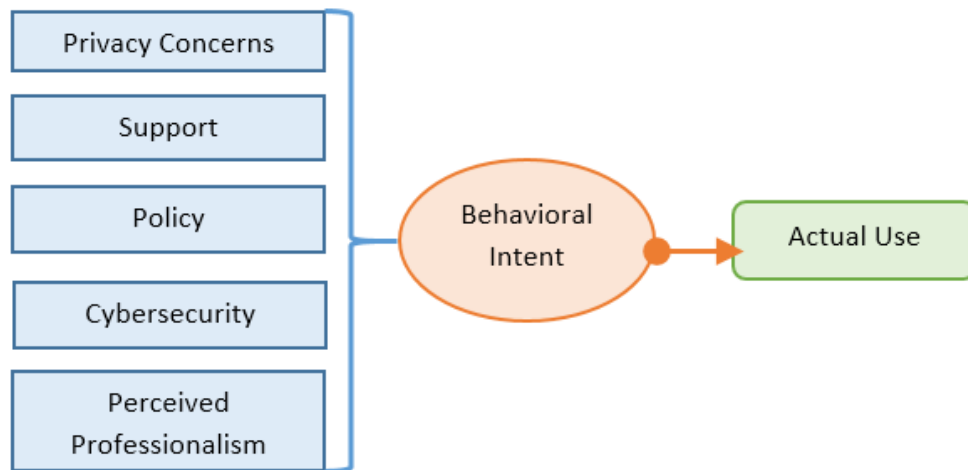

Figure 6.1 Revised Original HSMA

Figure 6.2 Fully Revised HSMA

The fully revised HSMA, Figure 6.2, represents the summary of findings for this study and provides the framework for future research directions and policy priorities. Overall, the model confirmed the need for formal policies addressing parameters of use, and privacy and security concerns as factors that influence adoption intent, but rejects the suggestion that social media is useful (perceived useful) to clinicians for patient engagement and communication at this time. Ease of use, relative advantage, and trialability were fully rejected by the findings; however the results do partially confirm organizational support as an influencer; though, the support structure clinicians are looking for may not be at the organizational level; rather, a professional-peer level, indicated by the new factor identified - perceived professionalism.

Last, the social factor identified in both literature (Hanzel, Richards, Schwitters, Smith, Wendland, Martin, & Keltgen, 2017) and theory (Putnam, 1993), interaction cultivation, remains partially debatable. This study can conclude that pediatric clinicians do not feel using social

media for patient communication and engagement will cultivate more frequent and meaningful interactions. However, three thoughts regarding the interaction cultivation findings: interaction cultivation may be a better post adoption measure and/or benchmark, interaction cultivation may be a better measure for peer-to-peer social media adoption, and "social" measures may need to be redefined for provider-patient relationships.

<div align="center">Pediatric Considerations</div>

Pediatric specific concerns centralized on one data theme - validity. The ability to virtually validate identities and information on social media. Validity may be considered a sub-area of cybersecurity and privacy, but should be addressed on its own when considering the vulnerable population in pediatric health. A recent study observed that patients who actively use social media to connect with their healthcare provider are also more likely to switch providers more often than patients who do not use social media to connect with providers. This phenomenon was attributed to poor interpretation of communications and the inability to immediately address information that is not understood or sensed as incorrect (Smailhodzic, Hooijsma, Boonstra, & Langley, 2016). Validity issues around interpretation of information exchanges may be difficult to resolve as the nature of communication is subjective regardless of delivery method (Lopez, Hanson, Yorke, Johnson, Mill, Brown, & Barach, 2017). Worried and concerned parents may not construe messages as intended. Additionally, parent and young patients often do not have the knowledgebase to reference and process more complicated, serious, or detailed health information. This knowledge gap between the clinician sending the message and the patient receiving it can cause serious miscommunications and potential harm. Last, although minor patients have the right to be informed, parental censoring may be difficult if

adolescent patients can directly communicate with their providers (Bush, Connelly, Fuller, & Perez, 2016).

Limitations

Limitations of this study were found in the design, scope, and instrument. Design limitations include the case sample population (small, localized sample), the single observation, and a low response rate. The small, localized, convenience sample from a single hospital yields data that may not be applicable to a larger population. Further, the sample population consisted only of pediatric clinicians, thought the applicability of using social media for patient communications and engagement may be applied to all patients; therefore, a study using a variety of clinicians would offer additional understanding. The research timeline limited the data collection period to a cross-sectional examination. Findings observed from this study may evolve over time, even within the same sample, given any changes and advancements with the identified influencing factors. However, cross-sectional observations are often used in establishing a basis for advancing research (Greene, Caracelli, & Graham, 1989), and implications of the findings provide context for new research. Last, the low response rate may have skewed the results. The case institution anticipated a higher rate of return based on previous surveys. During the survey participation period, three mandated surveys were also distributed to the sample population. This inquiry was not mandatory for associates to participate. Therefore, it is likely that survey fatigue contributed to the low response rate.

Scope limitations include parameters for social media and factors included in the model. The defined scope for social media excluded Peer-to-Peer sites which literature indicated as the most widely used social media platform. However, provider-centric social media are not used

for patient communications or engagement, excluding these platforms from consideration in this study. Additionally, some factors that may influence adoption were beyond the scope of this study such as provider insurance and liability.

The survey tool also proved to be a limitation. Though the tool used only validated measures, scales for directional impacts were not accounted for in advance. All survey questions were posed with positive inflection, requiring the Likert Scale to align the same for every question asked. However, after examination of the survey responses and the quantitative analysis an improved survey design that accounted for negatively influencing factors versus positively influencing factors may have generated more factors as statistically significant.

Implications and Recommendations for Further Study

The conditional implication from the research outcomes signify pediatric clinicians have low or little intent to adopt social media for patient communication and engagement. Providers are too concerned with privacy and security issues to entertain the potential utility social media contributes. A lack of support and use-promotion from healthcare employers, regulating bodies, and peers leaves clinicians feeling uncertain about how, when, and why social media adoption should be considered for professional use. A better understanding of the negative impacts identified through this examination generates blueprints for future studies and policy.

Assuming social media will not be excluded as a healthcare tool (due to high reservations and lack of recognized utility), future studies should explore the expanded dimensions for privacy concerns that includes both patient and provider threats. Cybersecurity should also be researched, with focus specifically on use of social media in healthcare that would address identity validation issues. Last, exploration and understanding for the role healthcare

organizations play in influencing adoption, including support and guidance for changes to expected workflow and compensation. Last, future studies may consider behavioral expectations as a dependent variable in addition to behavioral intent as recent information technology studies suggest behavioral expectations may be a better measure for adoption research (Guarav, Ramesh, Akhtar, & Dash, 2017).

Policy for social media use in healthcare should prioritize their efforts by first addressing privacy and data security concerns, including identity validation measures. Since the intent to adopt is so low, addressing the most egregious adoption deterrents first may mitigate concerns and revitalize diffusion. Next, policies around use parameters that address workflow integrations and compensation changes pertaining to additional time spent learning the new workflows should be established at the regulatory level. Last, advocates of social media use in healthcare should encourage a new image of social media, a new reputation for social media platforms not limited to personal use, and legitimate for professional applications.

Conclusion

Clinicians are responsible for both the physical care of their patients and the administrative care of their information. To be professional in health care, the confidentiality between a provider and patient cannot be breached; else, the trust is lost (Smailhodzic, Hooijsma, Boonstra, & Langley, 2016). If healthcare institutions recognize the benefits of social media use, then more effort to create and establish policies and implementation plans. Healthcare is not the only industry to involve sensitive information online, and the assurance of data security often depends on the practice of the participants (Mamlin & Tierney, 2017). Literature suggest professional interest to include social media into standard practice for patient communication and engagement is evident and the benefits are discernable; but the findings from this study cannot

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fully support those claims. However, potential benefits cannot be measured if they are not realized. Therefore, researchers and healthcare professionals should continue to collaborate on solutions for adoption apprehensions and improve the general opinion of social media use in healthcare. This case study merely scratches the surface for social media adoption topics in healthcare research. The HSMA created and revised for this study provided a new framework for assessing the adoption of social media by healthcare professionals, and can be applied to various applications of social media adoption in future studies. Though, if findings continue to echo the results presented in this study, researchers may want to redirect their efforts to identify more appropriate communication tools for healthcare professionals. The quality of delivered care can only improve if providers are willing to adopt technical innovations, especially for communication (Ried, Compton, Grossman, & Fanjiang, 2005); however, whether social media is the next advancement in healthcare communication methods is uncertain.

APPENDIX A DEFINITION OF TERMS

1. Clinician: a healthcare professional providing primary care and responsibility for patients, rather than one involved with theoretical or laboratory studies.

2. Ethical Concerns: Inappropriate use of Social Media that could lead to unethical practice of medicine

3. Healthcare: Although referred to as a health-care system, the United States actually delivers health care through a vast patchwork of public, for-profit and not-for-profit clinics; small community hospitals; large teaching and research institutions; health maintenance organizations; and thousands of doctors in private practice whose medical services are built around entrepreneurial enterprises.

4. Healthcare Tool: The Institute of Medicine (IOM) defines 6 aims healthcare (see IOM 6 Aims for further detail). Tool can be defined as anything used as a means of accomplishing a task or purpose; further, tools can be repurposed in new ways or expanded upon which is known as innovation. Therefore, a healthcare tool is anything used as a means of accomplishing, or improving, any of the 6 healthcare aims.

5. Institution of Medicine (IOM) 6 Aims of Healthcare:

    a. Safe: Avoiding harm to patients from the care that is intended to help them.

    b. Effective: Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively).

    c. Patient-centered: Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

d. Timely: Reducing waits and sometimes harmful delays for both those who receive and those who give care.

e. Efficient: Avoiding waste, including waste of equipment, supplies, ideas, and energy.

f. Equitable: Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

6. Interaction Cultivation: people brought together through the nature of their work or relationship, or discovering each other and beginning to interact on a sustained basis.

7. Legal Concerns: Inappropriate use of Social Media that could lead to legal reproductions

8. Organizational Support: Institutional support takes multiple forms:

a. Establishing an administrative home for the Social Media program

b. Ongoing professional development for Social Media teaching teams, including opportunities for associates to discuss development and well-being

c. An assessment plan that attends to both the associate and the program level, and helps those involved with the Social Media program engage in regular reflection and program improvements

d. Recognizing and celebrating those participating in the Social Media program

9. Pediatric Medicine: Branch of medicine that deals with the medical care of infants, children, and adolescents, and the age limit usually ranges from birth up to 18 years of age

10. Peer Support: Occurrence of colleagues providing knowledge, experience, and emotional, social or practical help to each other, Peer-to-Peer.

11. Perceived Ease of Use: The degree to which a person believes that using a particular system would be free of effort

12. Perceived Value to Patients: Achieving high value for patients must become the overarching goal of health care delivery, with value defined as the health outcomes achieved

13. Perceived Usefulness: The degree to which a person believes that using a particular system would enhance his or her job performance

14. Privacy: the state or condition of being free from being observed or disturbed by other people; the state of being free from public attention.

15. Relative Advantage: A product's degree of superiority and attractiveness to customers over similar existing products. A competitive advantage is commonly achieved by offering consumers greater value, either by lowering prices or by supplying improved benefits and service that quantifies higher prices.

16. Social Media: The collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are among the different types of Social Media. Some examples of popular Social Media are Facebook, Twitter, and Reddit.

17. Technology Adoption: the adoption or acceptance of a new product or innovation, according to the demographic and psychological characteristics of defined adopter groups.

18. Trialability: How effortless it is for the target audience to interact with the new concepts or experiment with the product? How easily can they try it out? The more potential users or patrons can test the product or view the work, the more likely individuals will adopt it.

19. Use (of social media): Engaging and/or Communicating with Patients: Includes all provider/patient messages and communications that are currently satisfied by phone calls, emails, and letters. The subject of correspondence to be considered includes all topics that do not currently require face to face communication.

APPENDIX B FULL TEXT TABLES

Table 4.1 HSMA Constructs by Theory				
Technology Acceptance Model				
Construct	Description	Detailed Measure	Scale	Source
Actual Use	Actual Use of Social Media to engage and/or communicate with patients	Do you currently use Social Media to engage and/or communicate with patients?	1. No 2. Yes	
Behavioral Intent	Intent to start using Social Media as a means to engage and/or communicate with patients	Assuming I have access to use Social Media, I intend to use it to engage and/or communicate with patients, Given that I have access to Social Media, I predict that I would use it to engage and/or communicate with patients	1. Very Unlikely 2. Unlikely 3. Somewhat Unlikely 4. Undecided 5. Somewhat Likely 6. Likely 7. Very Likely	Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, (2). 186.
Usefulness	Perceived Usefulness of Social Media as a tool for engagement and/or communication with patients	Using Social Media to engage and/or communicate with patients improves my performance in my job Using Social Media to engage and/or communicate with patients increases my productivity Using Social Media to engage and/or communicate with patients enhances my effectiveness in my job I find using Social Media to engage and/or communicate with patients to be useful in my job	1. Strongly Disagree 2. Disagree 3. Somewhat Disagree 4. Undecided 5. Somewhat Agree 6. Agree 7. Strongly Agree	Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, (2). 186.
Ease of Use	Perceived Ease of Use of Social Media as a tool for engagement and/or communication with patients	My interaction with Social Media is clear and understandable when used to engage and/or communicate with patients Interacting with Social Media to engage and/or communicate with patients does not require a lot of my mental effort I find Social Media easy to use for engaging and/or communicating with patients I find it easy to get Social Media to do what I want it to do in order to engage and/or communicate with patients	1. Strongly Disagree 2. Disagree 3. Somewhat Disagree 4. Undecided 5. Somewhat Agree 6. Agree 7. Strongly Agree	Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, (2). 186.

Social Capital				
Interaction Cultivation	A structural dimension which refers to the frequency of interaction, the frequency of contact, and number of contacts	Together with your patients, Social Media promotes the frequency of engagement and/or communication interactions between both parties Together with your patients, Social Media promotes the frequency of contact for engagement and/or communication between both parties Together with your patients, Social Media promotes the number of engagement and/or communication contacts between both parties	1. Strongly Disagree 2. Disagree 3. Somewhat Disagree 4. Undecided 5. Somewhat Agree 6. Agree 7. Strongly Agree	Gelderman, C. J., Semeijn, J., & Mertschuweit, P. P. (2016). The impact of social capital and technological uncertainty on strategic performance: The supplier perspective. Journal Of Purchasing And Supply Management, 22(Special Issue of best papers of the
Diffusion of Innovation				
Relative Advantage	The degree to which using Social Media to engage and/or communicate with patients is perceived as better than the idea it supersedes	Social Media is better than using other methods for engaging and/or communicating with patients Social Media is more interesting than other methods I have used to engage and/or communicate with patients Using Social Media made engaging and/or communicating with patients a better experience than I would have otherwise I feel engaging and/or communicating with patients occurs more quickly and easily because of using Social Media I had more fun engaging and/or communicating with patients because of using Social Media Social Media offered me real advantages over the way I usually engage and/or communicate with patients	1. Strongly Disagree 2. Disagree 3. Somewhat Disagree 4. Undecided 5. Somewhat Agree 6. Agree 7. Strongly Agree	Atkinson, N. (2007). Developing a questionnaire to measure perceived attributes of eHealth innovations. American Journal Of Health Behavior, 31(6), 612-621.

| Trialability | The degree to which Social Media used to engage and/or communicate with patients may be experimented with on a limited basis | Being able to try out Social Media to engage and/or communicate with patients is important in my deciding whether or not to use it

I am more likely to want to use Social Media to engage and/or communicate with patients if I could be part of a pilot test

I really won't lose much by trying Social Media to engage and/or communicate with patients even if I don't like it

I like being able to try out Social Media to engage and/or communicate with patients before deciding whether I like it or not | 1. Strongly Disagree
2. Disagree
3. Somewhat Disagree
4. Undecided
5. Somewhat Agree
6. Agree
7. Strongly Agree | Atkinson, N. (2007). Developing a questionnaire to measure perceived attributes of eHealth innovations. American Journal Of Health Behavior, 31(6), 612-621. |
|---|---|---|---|---|
| **Other** | | | | |
| Organizational Support | From the employees' perspective, the perception that support for innovation is available | The way of remuneration in our organization motivates employees to suggest new things and procedures such as using Social Media to engage and/or communicate with patients

Our organization has set aside sufficient resources to support the implementation of new ideas such as using Social Media to engage and/or communicate with patients

Our organization provides employees time for putting ideas and innovations into practice such as using Social Media to engage and/or communicate with patients | 1. Strongly Disagree
2. Disagree
3. Somewhat Disagree
4. Undecided
5. Somewhat Agree
6. Agree
7. Strongly Agree | Lukes, M., Stephan, U. (2017) "Measuring employee innovation: A review of existing scales and the development of the innovative behavior and innovation support inventories across cultures", International Journal of Entrepreneurial Behavior & Research, Vol |

Privacy Concerns	Situation-specific context, clinicians' concerns about possible loss of privacy as a result of information disclosure on Social Media when used to engage and/or communicate with patients	I am concerned that the information I submit on Social Media to engage and/or communicate with patients could be misused I am concerned that others can find private information about patients on Social Media if I use it to engage and/or communicate with patients I am concerned about transmitting engagement and/or communication information to patients through Social Media, because of what others might do with it I am concerned about engaging and/or communicating with patients using Social Media, because information could be used in a way I did not foresee	1. Strongly Disagree 2. Disagree 3. Somewhat Disagree 4. Undecided 5. Somewhat Agree 6. Agree 7. Strongly Agree	Heng Xu, h., Dinev, T. t., Smith, J. j., & Hart, P. h. (2011). Information Privacy Concerns: Linking Individual Perceptions with Institutional Privacy Assurances. Journal Of The Association For Information Systems, 12(12), 798-824.
Demographics	General sample attributes	Age	1. 18-24 2. 25-40 3. 40-60 4. Over 60	-
		Gender	1. Male 2. Female	
		Current Job Role	1. Nurse 2. Medical Assistant 3. Outpatient Therapist 4. Inpatient Therapist 5. Medical/Surgical Technician 6. Advanced Practice (ARNP, PA, CRNA) 7. Physician 8. Other	
		Total Years in Practice	1. Less than 1 2. 2-5 3. 6-10 4. Over 10	
		Current Social Media User	1. Yes 2. No	

Table 4.2: Demographic Data and Categories

Demographic Variable	Category
Age	1. 18-24 2. 25-40 3. 40-60 4. Over 60
Gender	1. Male 2. Female
Job Role	1. Nurse 2. Medical Assistant 3. Outpatient Therapist 4. Inpatient Therapist 5. Medical/Surgical Technician 6. Advanced Practice (ARNP, PA, CRNA) 7. Physician 8. Other
Years in Practice	1. Less than 1 2. 2-5 3. 6-10 4. Over 10

APPENDIX C IRB, INFORMED CONSENT, & SURVEY

Nemours

Full Accreditation

Nemours Office of Human Subjects Protection
Nemours/Alfred I. duPont Hospital for Children
1600 Rockland Road
Wilmington, DE 19803
Fax: 302-651-4683
Office: 302-298-7613
MEMORANDUM

DATE: December 16, 2016
TO: Rachel Mustonen, PhD in progress, MSHI, BSCE
FROM: Nemours IRB 1
STUDY TITLE: [919493-2] Social media as a healthcare tool: case study identifying factors
                   that influence Florida pediatric clinicians' adoption choice
IRB #:   919493
SUBMISSION TYPE: RESEARCH DETERMINATION
ACTION: NOT HUMAN SUBJECTS RESEARCH
DECISION DATE: December 14, 2016

Thank you for your submission of Response/Follow-Up materials for this research study. Nemours IRB 1 has determined this project does not meet the definition of human subject research under the purview of the IRB according to federal regulations.

The IRB recommends that Investigator familiarize themselves with the SQUIRES guidelines.

Please Note that any changes that may impact on the status of this project need to be submitted to the IRB for review.

Reviewed/approved documents in this submission:

- Application Form - Application - REQUEST for Research Determination_Revised.docx (UPDATED: 12/6/2016)
- Cover Sheet - Cover Letter_Conditional Approval Response.docx (UPDATED: 12/6/2016)
- Proposal - Proposal Detail_Revised for QI_Mustonen.docx (UPDATED: 12/6/2016)

If you have any questions, please contact Camille Varacchi at AI duPont Hospital for Children 1600 Rockland Road, ARB Room 160-A, Wilmington, Delaware 19803 at (302) 651-6807 or Camille.Varacchi@nemours.org. Please include your study title and reference number in all correspondence with this office.

Request for Participation

You have been asked to participate in a research study!

The study is called, Social Media as a Healthcare tool: A case study identifying factors that influence Florida pediatric clinicians' intent to adopt Social Media to engage and communicate with patients.

The survey is being conducted by a fellow NCH associate who will use the results for doctoral research at the University of Central Florida. The purpose of the survey is to collect data on the factors that influence pediatric clinicians' decision to use, or not use, Social Media to communicate and/or engage with patients.

All current NCH clinical associates are encouraged to participate, though participation is 100% voluntary!

The study will be available for 30 days, but the survey can only be taken once. The survey should take approximately 10 minutes to complete.

The final survey results will be shared with NCH and your contribution is greatly appreciated! Thank you in advance for your time and effort!

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Nemours

Informed Consent for Participation in an

Observational / Non-Interventional Research Study

You have been asked to be in a research study. This form explains the research and your rights as a research participant. You should understand the research study before you agree to be in it.

WHAT IS THE TITLE OF THE STUDY?
Social Media as a healthcare tool: A case study identifying factors that influence Florida pediatric clinicians' intent to adopt Social Media to engage and communicate with patients

WHO IS IN CHARGE OF THE STUDY AT NEMOURS?
If you have a question, complaint, or problem related to the study, you can call the investigator anytime at the numbers listed below.

Principle Investigator	Rachel Mustonen
Study Supervisor (UCF)	Su-I Hou, PhD
Email	rmustone@nemours.org
Phone Number	407-223-5805

WHO SHOULD RESEARCH PARTICIPANTS CONTACT ABOUT THEIR RIGHTS?
If you have questions about your rights as a research participant, what to do if you are injured, if you would like to offer input or obtain information, or if you cannot reach the investigator or want to talk to someone else who is not involved with this research, you may contact the persons listed below.

Chairperson, Nemours IRB 1 at 302-651-5970
Director, Nemours Office of Human Subjects Protection at 302-298-7613
Email address: NOHSP@nemours.org

WHAT IS THE PURPOSE OF THE STUDY?
The purpose of the survey is to collect data on the factors that influence pediatric clinicians' decision to use, or not use, Social Media to communicate and/or engage with patients. The survey data will contribute to doctoral dissertation research for the Principle Investigator (under the

supervision of Dr. Su-I Hou) at the University of Central Florida, College of Health and Public Affairs.

WHO CAN BE IN THE STUDY?
All current NCH clinical associates

HOW LONG WILL PARTICIPATION IN THE STUDY LAST?
The study will be available for 30 days, but the survey can only be taken once.

IS BEING IN THE STUDY VOLUNTARY?
Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. If at any time you discontinue the survey, your results will be discarded. The results of the research study may be published, but your name will not be used. The following questionnaire is anonymous. The results of the study may be published but your name will not be known.

WILL I BE PAID FOR BEING IN THIS STUDY?
There is no compensation for participation. No arrangement exists that would allow participants to share in any profit generated from this study or future research.

SIGNATURES:
I am making a decision whether or not to participate in this study. I have read this form, or have had it read to me in a language I understand. I have been given enough time to make this decision. I have asked questions and received answers about things I did not understand. I willingly consent to participate in this study. By signing this form, I am not giving up any rights to which I am entitled under law.

.

Signature of Participant   Date

Survey with e-Informed Consent

Survey Title: Social Media as a Healthcare Tool

Consent Nemours - Informed Consent for Participation in an Observational / Non-Interventional Research Study

You have been asked to be in a research study. This form explains the research and your rights as a research participant. You should understand the research study before you agree to be in it.

1. WHAT IS THE TITLE OF THE STUDY?
   Social Media as a healthcare tool: A case study identifying factors that influence Florida pediatric clinicians' intent to adopt Social Media to engage and communicate with patients

2. WHO IS IN CHARGE OF THE STUDY AT NEMOURS?
   If you have a question, complaint, or problem related to the study, you can call the investigator anytime at the numbers listed below.

   Principal Investigator   Rachel Mustonen
   Email   rmustone@nemours.org

3. WHO SHOULD RESEARCH PARTICIPANTS CONTACT ABOUT THEIR RIGHTS?
   If you have questions about your rights as a research participant, what to do if you are injured, if you would like to offer input or obtain information, or if you cannot reach the investigator or want to talk to someone else who is not involved with this research, you may contact the persons listed below.

   Chairperson, Nemours IRB 1 at 302-651-5970
   Director, Nemours Office of Human Subjects Protection at 302-298-7613
   Email address: NOHSP@nemours.org

4. WHAT IS THE PURPOSE OF THE STUDY?
   The purpose of the survey is to collect data on the factors that influence pediatric clinicians' decision to use, or not use, Social Media to communicate and/or engage with patients. The survey data will contribute to doctoral research at the University of Central Florida, Department of Health and Public Affairs.

5. WHO CAN BE IN THE STUDY?

All current NCH clinical associates

6. HOW LONG WILL PARTICIPATION IN THE STUDY LAST?
   The study will be available for 30 days, but the survey can only be taken once. The survey should take approximately 10 minutes to complete.

7. IS BEING IN THE STUDY VOLUNTARY?
   Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. If at any time you discontinue the survey, your results will be discarded. The results of the research study may be published, but your name will not be used. The following questionnaire is anonymous. The results of the study may be published but your name will not be known.

8. WILL I BE PAID FOR BEING IN THIS STUDY?
   There is no compensation for participation. No arrangement exists that would allow participants to share in any profit generated from this study or future research.

9. SIGNATURE
   I am making a decision whether or not to participate in this study. I have read this form, or have had it read to me in a language I understand. I willingly consent to participate in this study. By selecting I Agree below, I am signing this form. I understand signing that by signing the form I am not giving up any rights to which I am entitled under law.

❍ I agree
❍ I do not agree

Condition: I do not agree Is Selected. Skip To: End of Survey.

Instructions: There are no right or wrong answers. Please select the answer that best reflects your truth. The survey should take approximately 10 minutes to complete.

Definition of Survey Terms: Survey questions reference the terms 'Social Media' and 'engaging and/or communicating with patients' which should be understood by the following definitions for the duration of the survey

Social Media: The collective of on-line communication channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are

among the different types of social media. Some examples of popular social media are Facebook, Twitter, Linked-In, and Google+1.

Engaging and/or Communicating with Patients: Includes all provider/patient messages and communications that are currently satisfied by phone calls, emails, and letters. The subject of correspondence to be considered includes all topics that do not currently require face to face communication.

Q1 Do you currently use Social Media to engage and/or communicate with patients?

❍ Yes
❍ No

Condition: Yes Is Selected. Skip To: Which Social Media websites do you cu....Condition: No Is Selected. Skip To: What is the most influential reason a....

Q1Y Which Social Media websites do you currently use to engage with or communicate with patients?

Condition: Which Social Media websites... Is Displayed. Skip To: Do you use any Social Media websites ....

Q1N What is the most influential reason as to why you don't choose use Social Media to engage with or communicate with patients?

Condition: What is the most influential reason...Is Displayed. Skip To: Do you use any Social Media websites ....

Q2 Do you use any Social Media websites for personal use?

❍ Yes
❍ No

Condition: Yes Is Selected. Skip To: Which Social Media websites do you us....Condition: No Is Selected. Skip To: End of Block.

Q2Y Which Social Media websites do you use for personal use?

QI For the following Questions, please select the response that best represents your Likelihood to use or start using Social Media to engage and/or communicate with patients

Q3 Assuming I have access to use Social Media, I intend to use it to engage and/or communicate with patients

- ○ Extremely likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Neither likely nor unlikely
- ○ Slightly unlikely
- ○ Moderately unlikely
- ○ Extremely unlikely

Q4 Given that I have access to Social Media, I predict that I would use it to engage and/or communicate with patients

- ○ Extremely likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Neither likely nor unlikely
- ○ Slightly unlikely
- ○ Moderately unlikely
- ○ Extremely unlikely

QI2 For the following Questions, please select the response that best represents your Agreement with each of the questions as they pertain to the use of Social Media to engage and/or communicate with patients

Q5 I think using Social Media to engage and/or communicate with patients will improve my performance in my job

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q6 I think using Social Media to engage and/or communicate with patients will increase my productivity

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q7 I think using Social Media to engage and/or communicate with patients will enhance my effectiveness in my job

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q8 I think I will find using Social Media to engage and/or communicate with patients to be useful in my job

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q9 I think my interaction with Social Media will be clear and understandable when used to engage and/or communicate with patients

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q10 I think interacting with Social Media to engage and/or communicate with patients will not require a lot of my mental effort

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q11 I will find Social Media easy to use for engaging and/or communicating with patients

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q12 I will find it easy to get Social Media to do what I want it to do in order to engage and/or communicate with patients

❍ Strongly agree
❍ Agree
❍ Somewhat agree
❍ Neither agree nor disagree
❍ Somewhat disagree
❍ Disagree
❍ Strongly disagree

Q13 Together with your patients, Social Media will promote the frequency of engagement and/or communication interactions between both parties

❍ Strongly agree
❍ Agree
❍ Somewhat agree
❍ Neither agree nor disagree
❍ Somewhat disagree
❍ Disagree
❍ Strongly disagree

Q14 Together with your patients, Social Media will promote the frequency of contact for engagement and/or communication between both parties

❍ Strongly agree
❍ Agree
❍ Somewhat agree
❍ Neither agree nor disagree
❍ Somewhat disagree
❍ Disagree
❍ Strongly disagree

Q15 Together with your patients, Social Media will promote the number of engagement and/or communication contacts between both parties

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q16 I think using Social Media will be better than using other methods for engaging and/or communicating with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q17 I think Social Media is more interesting than other methods I have used to engage and/or communicate with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q18 Using Social Media will make engaging and/or communicating with patients a better experience than I would have otherwise

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q19 I feel engaging and/or communicating with patients will occur more quickly and easily because of using Social Media

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q20 I will have more enjoyment engaging and/or communicating with patients because of using Social Media

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q21 Social Media offers me real advantages over the way I usually engage and/or communicate with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q22 Being able to try out Social Media to engage and/or communicate with patients is important in my deciding whether or not to use it

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q23 I am more likely to want to use Social Media to engage and/or communicate with patients if I could be part of a pilot test

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q24 I really won't lose much by trying Social Media to engage and/or communicate with patients even if I don't like it

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q25 I like being able to try out Social Media to engage and/or communicate with patients before deciding whether I like it or not

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q26 The way of compensation in our organization motivates employees to suggest new things and procedures such as using Social Media to engage and/or communicate with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q27 Our organization has set aside sufficient resources to support the implementation of new ideas such as using Social Media to engage and/or communicate with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q28 Our organization provides employees time for putting ideas and innovations into practice such as using Social Media to engage and/or communicate with patients

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q29 I am concerned that the information I submit on Social Media to engage and/or communicate with patients could be misused

○ Strongly agree
○ Agree
○ Somewhat agree
○ Neither agree nor disagree
○ Somewhat disagree
○ Disagree
○ Strongly disagree

Q30 I am concerned that others can find private information about patients on Social Media if I use it to engage and/or communicate with patients

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q31 I am concerned about transmitting engagement and/or communication information to patients through Social Media, because of what others might do with the information

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

Q32 I am concerned about engaging and/or communicating with patients using Social Media, because information could be used in a way I did not foresee

- ○ Strongly agree
- ○ Agree
- ○ Somewhat agree
- ○ Neither agree nor disagree
- ○ Somewhat disagree
- ○ Disagree
- ○ Strongly disagree

QI3 For the following Questions, please select the response that best represents your current demographics

Q33 What age group do you currently fall in?

○ Under 18
○ 18 - 24
○ 25 - 34
○ 35 - 44
○ 45 - 54
○ 55 - 64
○ 65 - 74
○ 75 - 84
○ 85 or older

Q34 Gender

○ Male
○ Female

Q35 What is your current job role?

○ Physician
○ Advanced Practice (ARNP, PA, CRNA)
○ Nurse
○ Pharmacist
○ Therapist
○ Medical Assistant/Unit Clerk
○ Medical/Surgical Tech
○ Other

Q36 How many years have you worked in healthcare? (all roles including your current role)

○ Less than 1
○ 2-5 years
○ 6-10 years
○ Over 10 years

Q37 Do you have any final thoughts regarding social media use for engaging or communicating with patients that you would like to share?

APPENDIX D UCF IRB

IRB Email Confirmation

RE: IRB Questions- Rely upon process

Patria Davis <Patria.Davis@ucf.edu> on behalf of Institutional Review Board <irb@ucf.edu>

Tue 12/13/2016 4:14 PM

To: Rachel Mustonen <rmustonen@knights.ucf.edu>;

Cc: Sophia Dziegielewski <Sophia.Dziegielewski@ucf.edu>; Gillian Morien <Gillian.Morien@ucf.edu>; Kamille Chaparro <Kamille.Chaparro@ucf.edu>; Renea Carver <Renea.Carver@ucf.edu>;

Importance: High

To: Rachel Mustonen

Since you have obtained IRB approval from Nemours, per UCF requirements, you will not need UCF IRB review. **However, you will need to submit your study in iRIS for record keeping purposes immediately.** I see that you do not have an active iRIS account.

Please click the link below for instructions on obtaining an iRIS account. Once you have activated your iRIS account, select "Add New Study" and complete the application. Please remember to also add yourself to section 3.3 as "study contact" and add your Faculty advisor in section 3.4. All researchers should then be added to section 4.2, including the Hospital PI and other external researchers. Be certain to add the Hospital PI to section 4.4 for external collaborators. When completing the submission, remember to upload any supporting documents you have related to this study (i.e. Nemours IRB approval letter, protocol, consent form, etc.) and then submit and route to your faculty advisor and Department dean/chair or director for signature. This will complete the submission process.

Once we have received your submission, you will receive a formal notice from the UCF IRB for this study and you will notice that the study status for this submission in iRIS will be "Rely Upon Other IRB."

iRIS Accounts

http://www.research.ucf.edu/compliance/IRB/Submissions/login_info.html

Let me know if you have any questions. Good luck with your Research!
Thanks,
Patria Davis M.S.P., CIP
IRB Manager
UCF IRB Office
407-882-2012, 407-823-2901, 407-882-0889
Patria.Davis@ucf.edu

Full Accreditation

UCF Stands for Opportunity

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Notice that UCF will Rely Upon Other IRB for Review and Approval

From : **UCF Institutional Review Board**
FWA00000351, IRB00001138

To   : **Rachel Marie Mustonen**

Date : **May 12, 2017**

IRB Number: SBE-17-13027

Study Title: **Social media as a healthcare tool: case study identifying factors that influence Florida pediatric clinicians' adoption choice**

Dear Researcher:

The research protocol noted above was reviewed by the University of Central Florida IRB Designated Reviewer on 5/12/2017. The UCF IRB accepts the Nemours Institutional Review Board review and approval of this study for the protection of human subjects in research. **The expiration date will be the date assigned by the Nemours Institutional Review Board and the consent process will be the process approved by that IRB.**

This project may move forward as described in the protocol. It is understood that the Nemours IRB is the IRB of Record for this study, but local issues involving the UCF population should be brought to the attention of the UCF IRB as well for local oversight, if needed.

All data, including signed consent forms if applicable, must be retained and secured per protocol for a minimum of five years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained and secured per protocol. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

Failure to provide a continuing review report for renewal of the study to the Nemours IRB could lead to study suspension, a loss of funding and/or publication possibilities, or a report of noncompliance to sponsors or funding agencies. If this study is funded by any branch of the Department of Health and Human Services (DHHS), an Office for Human Research Protections (OHRP) IRB Authorization form must be signed by the signatory officials of both institutions and a copy of the form must be kept on file at the IRB office of both institutions.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Patria Davis on 05/12/2017 09:10:12 AM EDT

IRB Coordinator

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