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An Interpretative Phenomenological Analysis of Telehealth Champions

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by

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An Abstract of a Dissertation Submitted to Nova Southeastern University in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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The implementation of telehealth applications is resource intensive and fraught with challenges unique to the people and places involved. The use of telehealth to provide clinical care to patients, educate patients and providers, and conduct research studies to advance medical science has been shown to positively affect issues of access and the quality of care. Previous research has focused on the use of specific technologies, known barriers to adoption and diffusion, and the general efficacy of these applications. Few studies have researched the role champions play in the deployment and operation of telehealth networks. The researcher proposed conducting an interpretative phenomenological analysis (IPA) of clinicians, educators and technical professionals within a successful telehealth network to determine the lived experiences that identify them as champions in the field.

Three research questions were studied: 1) What do telehealth champions believe to be the human elements necessary to advance telehealth systems?; 2) How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?; and 3) How do these champions use shared processes and experiences to help spur engagement? Semi-structured interviews with 16 champions from the three disciplines were conducted to explore their lived experiences as part of a telehealth network. Seven champion themes – *modern pioneers; champion teams; agents of change; knowledge brokers; supported by management; advocates, not champions;* and *well-prepared visionaries* – emerged from the iterative review and analysis of data. Findings suggest that telehealth champions are not born but instead created. They are modern pioneers who function as part of innovative telehealth teams. Champions also serve as agents of change who utilize their knowledge of disruptive technologies to advocate for improvement in established healthcare systems. They are problem solvers who serve as resources for their colleagues, organizations and collaborative networks. Telehealth champions channel the universal goals of improving patient care and expanding healthcare access to overcome adoption barriers. Applying the ideals of what it means to be champions and how they overcome barriers to new telehealth applications could prove to be very beneficial for those tasked with developing new networks.

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Chapter 1

Introduction

Background

Telehealth, which is derived from telemedicine terminology, is the use of computer-mediated communication to facilitate the healthcare of patients, formative and continuing education of providers and medical research protocols across distance and/or time (Maheu, Whitten, & Allen, 2002). Present day telehealth applications have evolved because of robust technological and process innovations, but concerns remain about the pace of adoption for these applications.

According to Zanaboni and Wootton (2012), telehealth applications are reshaping healthcare services through processes and networks that increase access and distribution. The widespread adoption of telehealth applications (clinical, educational and research) is experiencing slow adoption due to several factors. The first factor relates to the personal attitudes of the healthcare providers. Once individuals become familiar with the technology, they have to determine if it is advantageous for them to adopt the technology. These determinations are influenced by individual preferences and motivations. Second, Zanaboni and Wooten equate the normally slow adoption rate seen in telehealth to other health technologies where perceived benefits (or lack thereof), high-costs and governmental regulations have a direct effect on individual and institution adoption. Last, there are issues related to the cost-effectiveness and a lack of personal incentives inherent in telehealth.

The following is a report based on the current state of research into the efficacy of telehealth, the creation and adoption of telehealth systems and the professionals who are

impacted by technological revolutions. For the purposes of terminology, *telehealth* encompasses individual professionals in the fields of healthcare, education and information technology. As shown, the collaborative processes that make telehealth systems possible are dependent on all three groups to achieve success.

Collaborations in Telehealth

Telehealth systems are generally comprised of multiple locations and networks that operate on a "hub-and-spoke" model of service delivery (Gantenbein, Robinson, Wolverton, & Earls, 2011). Through the utilization of high-bandwidth broadband lines and connections to wide-area networks (like Internet2), coupled with applications such as video and audio (videoconferencing and consultation), imaging (scans and photos) and direct patient monitoring (telemetry and home health technologies), telehealth services are defined as a collaborative, computer-mediated communication between multiple locations, or *end-points*. Using the example of a telemental health network, Gantenbein et al. (2011) describe three main areas of collaboration which include: "direct intervention with the patient by a distant mental health specialist; consultation between a mental health provider and a distant primary care provider; and education and training in diagnosis and care for mental health" (p. 369). These three levels of telehealth collaboration work in tandem to provide education and clinical care through partnerships supported by educational, clinical and information technology staff. These collaborations are replicated across other telehealth services in a variety of configurations.

Throughout the process of telehealth adoption, implementation and sustainability, studies have established these technologies and processes as being effective and, in most ways, equivalent to traditional, in-person care (Gonzalez-Espada et al., 2009; Hassija &

Gray, 2011; Schwamm et al., 2009). Applications that are successful have been shown to be dependent on specific "local telemedicine champions" who take personal responsibility for moving the technology and processes forward (Zanaboni & Wootton, 2012). This account by Zanaboni and Wootton is consistent with other research findings examining the sustainability of telehealth networks. Brooks, Manson, Bair, Dailey, and Shore (2011) and Singh, Mathiassen, Stachura, and Astapova (2010) mention the importance of telehealth champions to networks, but they simply devote one or two sentences to the concept. This is the first known study that fully investigates the roles, impacts and challenges associated with telehealth networks from the viewpoints of these influential champions.

Examination of Telehealth Champions

While identified as important components of telehealth networks in the literature, little is known about how these "champions" overcome barriers and drive adoption within these new environments. Subsequently, three studies are examined in detail that have touched on the significance of champions as well as the gaps in the knowledge regarding how champions contribute to telehealth networks.

Zanaboni and Wootton (2012) assert that the pace of adoption for telehealth applications has been slow and uneven. They question why telehealth applications have not been adopted at the scale possible across enterprise systems and in an ubiquitous manner. In investigating the factors involved in adoption, the authors note that both individuals and organizations have to make determinations about specific technologies in each of the stages including: acquaintance, persuasion, decision, initial adoption and diffusion. There are multiple points where adoption can be delayed or abandoned within

these stages. The authors conclude that unless healthcare professionals are persuaded through first-hand experience about the technology's uses and advantages, adoption will be delayed or abandoned. Moreover, personal incentives derived through their experiences, are seen as keys to motivating professionals and creating champions. These motivations can be different for each champion depending on his or her status, career path and possibility for recognition (Zanaboni & Wootton, 2012).

While telehealth is increasingly being utilized to provide patient access to quality medical care, numerous human factors impede its widespread adoption (Brooks et al., 2011). Although individual professionals are recognized as having considerable influence on the success of telehealth systems, studies, such as those conducted by Brooks et al. (2011) and Singh et al. (2010) state the importance of champions, but these studies do not adequately examine how champions are able to overcome significant barriers to adoption.

Brooks et al. (2011) used semi-structured interviews of critical stakeholders involved with three telemental health clinics in order to "to understand the factors affecting the diffusion of telehealth clinics that provided mental health care to rural, American Indian Veterans" (p. 60). In their interviews with 39 administrators, clinicians, staff and representatives from veterans' organizations, the researchers identified six main themes from the respondents as possible "predictors of successful telehealth diffusion" (p. 64). In addition to overcoming issues related to the perceived need for services, support for services, attitudes of providers, inter-organizational collaboration and cultural sensitivity for patients and communities, respondents cited the need for individual champions to help influence local and clinical staff. These *telehealth outreach workers* were identified

as playing key roles in providing patient outreach services and building community trust. Outreach workers were responsible for multiple levels of interaction between the tribes, clinics and patients, and they were also technical liaisons for the telehealth equipment. In this research study, these champions were seen as directly affecting the rate of diffusion within a telehealth network. The researchers do not describe how the champions affected the network beyond the services they provided.

Singh et al. (2010) examined issues affecting the sustainability of telehealth networks. Through semi-structured interviews with 25 key actors (administrators, managers, clinicians and information technology specialists) involved with the development of a telehealth initiative, the researchers were able to identify critical points in the adoption and diffusion of the network over a 20-year period. Researchers also employed direct observation by non-participants of the network's services, as well as a review of secondary data sources in the form of proposals, papers and reports to gather data. At the heart of the process, the researchers identified an instrumental relationship between two champions – one a physician and the other a community leader. Their visionary leadership translated to the adoption of tactics that cultivated participation and expanded capabilities within the network (Singh et al., 2010). In this instance, the champions served as integral agents of change and were able to communicate their visions to the relevant parties within each of their social networks. The conclusions of this study further illuminate the critical necessity of collaboration and leadership by key stakeholders for the implementation and sustainability of new telehealth systems.

When researchers clearly identify the need for telehealth champions as an integral part of a successful network, little to no mention is made about how to identify, cultivate

and retain champions (Meyer, Clarke, Troke, & Friedman, 2012). The authors state, "Clinical champions are typically clinical leaders with MD, DO, NP, or PA qualifications, but variations do occur" (p. 1040). Currently, there is no known research that examines the role of non-clinical personnel as champions in the deployment of telehealth systems.

Problem Statement and Goal

Telehealth is increasingly being utilized to provide patient access to quality medical care, but numerous factors impede its widespread adoption (Brooks et al., 2011). Although individual professionals are recognized as having considerable influence on the success of telehealth systems, Brooks et al. (2011) and Singh et al. (2010) only state the importance of champions and do not adequately examine how champions are able to overcome significant barriers to adoption. Also, due to a lack of published research, the extent to which education specifically affects the lived experiences of telehealth champions is unknown. Additional research is needed to determine themes common to telehealth collaborators as defined by Gantenbein et al. (2011). It is hoped that the themes identified in this study speak to the role of individuals' attitudes and acceptances, the importance of education and training, and the ability of professionals to capitalize on opportunities as part of a team.

Although considerable resources are required to develop, launch and sustain telehealth applications, not all applications are adopted and utilized to their fullest potential (Zanaboni & Wootton, 2012). Through a better understanding of the challenges and opportunities faced by champions in clinical practice, information technology and clinical education, telehealth applications can be implemented more widely and

efficiently. As a result, by providing improved access to healthcare, telehealth systems can directly impact the provision of high-quality, patient-centered medical care (Singh et al., 2010).

The goal of this research was to advance the understanding of individual telehealth champions as essential collaborators in clinical, educational and research delivery systems. This research involved three distinct disciplines: clinicians, educators and information technologists. As part of their participation in a statewide telehealth system, each champion was responsible for the deployment of services in his or her areas of expertise. These experiences were investigated from the individual and collaborative viewpoints.

Previous studies that have used qualitative methods to explore the experiences of healthcare professionals within telehealth networks served as a basis for this study. Vuononvirta et al. (2009), studying the development of telehealth applications within a network in northern Finland, examined the pre-implementation attitudes of healthcare professionals and how those attitudes affected the usage of the telehealth system. Using a mixed-methods approach that combined in-depth interviews of 30 healthcare providers with observational data, the researchers focused their study on individuals who were informed leaders within the network. Although this research only focused on the clinical members of the network, the authors were able to show a difference in the attitudes of the participants and an effect of those attitudes on their levels of adoption.

This research builds on the work by Vuononvirta et al. (2009) and others who have reviewed the organizational challenges associated with the deployment of technology and communication applications across healthcare systems. Related research by André et al.

(2008), examining the barriers to adoption for technology in healthcare, also determined that the attitudes of healthcare providers were a crucial factor in the adoption of new technologies. Similar to Vuononvirta et al., André et al. identified changing attitudes, through education and training, as an imperative component for success.

Research Questions

The researcher conducted an interpretative phenomenological analysis (IPA) (Smith, Flowers, & Larkin, 2009, p. 1) of clinicians, educators and technical professionals within a successful telehealth network to determine what are the lived experiences that identify them as champions in the field. Additional themes were explored to examine the role of education in support of telehealth. There were three main research questions used to understand champion experiences:

1. What do telehealth champions believe to be the human elements necessary to advance telehealth systems?
2. How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?
3. How do these champions use shared processes and experiences to help spur engagement?

Rationale and Need for the Study

Studies have examined numerous aspects of telehealth including the healthcare professionals' experiences with the implementation of technology in the practice environment (André et al., 2008; Vuononvirta et al., 2009), the perceived usefulness of information and communication technologies by organizations and individuals (Gagnon et al., 2012), and processes that are useful to gauge readiness prior to implementation

(Légaré et al., 2010). Studies like those performed by Gagnon et al. (2012) looking at the adoption of technologies by healthcare professionals, merely cite the significance of "project champions or other key staff" as essential to the implementation of successful strategies (p. 251). Additional research is needed to understand those human experiences and factors that are universally relevant to the process.

André et al. (2008) designed a study of the literature to identify the factors related to the implementation of computer technology within healthcare systems. Through a review of 17 articles, the authors found that barriers centered on the initial attitudes, knowledge, roles and habits of healthcare professionals. Especially relevant to conversations regarding telehealth champions was the statement: "The dual needs to both assess and change attitudes were identified as crucial factors in allowing for the successful implementation of these new technologies" (p. 753). André et al. (2008) also cite training (initial and ongoing) as one of the most common strategies for successful implementation.

The attitudes of healthcare professionals were also prominently featured in a case study conducted by Vuononvirta et al. (2009). Through qualitative observation and interviews conducted with 20 healthcare professionals within a telehealth network, the researchers sought to see how the attitudes of healthcare professionals were connected to telehealth usage. Their findings resulted in descriptors for telehealth adopters that ranged from enthusiastic users, to hesitant users, to critical participants, to positive non-participants. While the negative attitudes of providers were not seen as an insurmountable barrier for adoption, providers with enthusiastic attitudes were viewed as helpful in the process of adoption. Vuononvirta et al. (2009) cite the "gap between

human knowledge and human activity" as an area for future research and application (p. 296). Could the translation of knowledge into action be a tactic unique to telehealth champions?

Throughout each of the studies referenced so far, discussions about telehealth systems involved the need for additional, specialized and ongoing training for those involved with patient care. Additionally, education (formative and continuing) is essential for healthcare professionals practicing in evolving workplaces (Gray & Sim, 2011; Spallek et al., 2010).

Gray and Sim (2011) explored the experiences of healthcare professionals completing their formative education and transitioning into their professional practice in order to determine essential clinical informatics capabilities. Through a phenomenological study of four participants who had graduated from a professional degree program within the last five years, the researchers determined that the knowledge acquired during the formative studies of the participants was inadequate for real-world practice situations. Instead, most of the clinical information competencies the participants obtained was "through unstructured, just-in-time, just-enough learning" (Gray & Sim, 2011, p. 42). When looking at these types of educational interventions in the context of an entire workforce, the inefficiencies and gaps in training have profound consequences for the providers as well as the healthcare delivery systems.

Integrating new technologies into healthcare delivery results in a paradigm shift for providers (Spallek et al., 2010). While the field of healthcare is not likely to swing from being a laggard of adoption to a pioneer, the changes in tools and process will eventually change how professionals view technology and apply it within the clinical practice. As in

other areas where technology presents significant changes, new processes in healthcare are created through trial and error, but these are widely diffused through education. Spallek et al. (2010) refer to emerging platforms where practitioners and patients have increasing opportunities for collaboration and experiential education through online and virtual communities of learning and practice. Education is the key for successful adoption. "The need to practice medicine based on best evidence makes it imperative that information is accurate, timely, and easily accessible" (p. 109).

Stance of the Researcher

The researcher's personal experience in the development of telehealth networks has demonstrated the need for all three disciplines to work in unison towards common goals. Due to the nature of small, rural hospitals and clinics, they often do not have the information technology (IT) staff necessary to help with implementation and trouble-shooting (Cho, Mathiassen, & Gallivan, 2009). This lack of resources can impede the establishment of telehealth networks. At the same time, a network can be put in place, but it will not succeed without clear clinical champions (Cho et al., 2009; Joseph, West, Shickle, Keen, & Clamp, 2011). Finally, without proper training and educational support, the technology will be underutilized and evidence-based practice updates will be delayed in their delivery to front-line providers (Casebeer et al., 2010; Means, Toyama, Murphy, Bakia, & Jones, 2010; Schleyer, Thyvalikakath, Spallek, Dziabiak, & Johnson, 2012).

Whitten and Holtz (2008) point out that while no two clinics or networks operate in the same way, lessons learned from the clinical, education and technology leaders within a network should be applicable across other networks. Herein lay the opportunity for a

unique and robust study of the complex human environment that supports telehealth networks.

Relevance and Significance

Breen and Matusitz (2010) detail the evolution of telehealth from its beginning with closed-circuit television systems, to the first astronauts in space, now to the brink of wide-spread adoption. Given that many of the initial technical hurdles have been overcome, the authors investigated outstanding issues and personal perceptions. Their findings indicate that the following areas of hindrance still exist: not all states have legislation in place to legitimize telehealth practices; in some states, health insurance companies attempt to restrict reimbursement for services outside the traditional medical model; and most crucial in their findings, there is a lack of educated personnel in terms of the required equipment, technology and processes. By further identifying and addressing the impediments facing individuals tasked with telehealth activities, the authors envision a more educated population of healthcare providers and patients. Technology is playing an increasingly important role in improving patient care, reducing costs and expanding access for patients (Gattoni & Tenzek, 2010). While describing the transformative nature of technology in healthcare, the authors call for an increased use of technology to support the clinical and educational needs of healthcare providers. Greater access to information through computer-mediated communication potentially offers solutions to some of the challenges seen in the current systems of care.

The use of technology through telehealth (clinical, educational and research) systems can change the inherent relationships within healthcare where communication is essential. Gattoni and Tenzek (2010) specifically cite physician to patient

communication within telehealth systems as an area in need of improvement. The improved patient access afforded by telehealth technologies brings with it concerns related to the education, socialization and competency of providers. Provider competence helps to neutralize barriers and demonstrate worth for both the provider and patient. To this end, the authors state that communication education is an integral part of how physicians develop strategies for communicating within new environments.

Although numerous articles detail the important role clinical champions serve in telehealth activities (Brooks et al., 2011; Cho et al., 2009; Joseph et al., 2011), none mention the role education champions play in telehealth systems. Even though some studies mention education as one way to address adoption and implementation issues (Carter, Muir, & McLean, 2010), studies that describe the role of an IT staff as telehealth champions are scarce.

Because telehealth networks are collaborative, focusing only on the clinical staff does not fully explain the experiences of the telehealth team. Clinicians, educators and technical support personnel are intrinsically linked, but they are not currently represented as such in the literature. Technical staffs are responsible for the establishment, maintenance and coordination of networks. This includes everything from laying cables to turning on the microphones. In a similar way, educators are responsible for training staff regarding the adoption of the technology, the deployment of new clinical processes and the continuing education of providers based on the latest clinical knowledge. The final member of the team, the clinician, is responsible for managing the patient encounter, consulting with colleagues and performing clinical care. Each set of personnel has a defined role to play that is dependent on the other linkages.

Barriers and Issues

The evolving nature of telehealth networks inherently creates barriers to be overcome and issues to be addressed. The researcher took into account several considerations for examining telehealth networks. The rapidly changing nature of the technology, processes and services being utilized in telehealth systems means that most networks are unique and in a constant state of flux. As previously discussed regarding the implementation of innovative technologies, all the endpoints within a network are not necessarily in the same stage of deployment. Additionally, each endpoint might only have access to a select number of telehealth applications – some may lack educational programs while others may utilize only one clinical application. While not entirely different, there are no two endpoints operating with the exact configuration and, therefore, the experiences of the champions are somewhat unique.

From an individual standpoint, different professions bring different challenges to the study. While each profession within the proposed areas of focus (clinical, educational and technical) is extremely busy and short of free time to participate in an in-depth interview process, it is going to be particularly challenging to enlist the participation of physicians during their normal business hours. Also, the three disciplines inherently have challenges that are unique to their positions. Data reflected enough commonality in the experiences of champions that a broader examination of universal themes could be completed.

Capturing the thoughts of a divergent group of professionals in an attempt to find commonalities in their experiences was a momentous undertaking from a logistical standpoint. At least five professionals from each discipline were interviewed in order to

provide a comprehensive representation of their experiences. Given the dispersed nature of participants across rural areas of the state, the researcher conducted interviews utilizing high-definition videoconferencing systems already in place. Studies that apply this methodology for qualitative research via videoconferencing are limited, but one example is an ethnographic study of undergraduate nursing students and preceptors conducted by Sedgwick, Alberta, and Spiers (2009). The authors recommended utilizing high-speed broadband and high-definition videoconferencing equipment as essential components to facilitating these types of communication. Based on these recommendations, and the lack of significant drawbacks identified by authors, the researcher utilized existing videoconferencing infrastructure for this study.

Limitations, Delimitations and Assumptions

There are a number of limitations that could have affected the validity of this study. The purposive sample was limited to networks within South Carolina and the sample was derived from identified champions who may have competing agendas given the business nature of telehealth. The researcher attempted to recruit a demographically diverse sampling of champions who are reflective of the networks they serve. Still, the final sample was weighted so that the majority of educators were female and the majority of technologists were male. Also, qualitative interviews have been recognized for not being neutral tools (Bloomberg & Volpe, 2008, p. 82). The interactions between the interviewer and interviewee could have resulted in the reframing of perceptions and changes in understanding by both parties. To this point, the researcher made every effort to refrain from interjecting an opinion into the process. This was further aided by the non-verbal communication the researcher was able to provide through the

videoconferencing platform, which resulted in fewer interruptions and a more fluid exchange of dialogue by the participants. Even with these possible limitations, the researcher is confident that the findings are valid and generalizable to other telehealth systems.

Regarding delimitations associated with this study, the researcher identified three telehealth groups (clinical, educational and technical) to be included. Interviews were conducted only with experts in each of the telehealth groups in order to ensure that participants had significant experiences with the technology and relationships being explored. With a sample size of five (or more) for each group, the findings were generalizable, both within, and across disciplines.

Finally, there were several important assumptions that influenced this study. The researcher expected that the interviewees would embrace their roles as champions and collaborate as part of the study. The willingness of champions to fully share their lived experiences was a factor outside of the researcher's control. While all participants were willing and helpful collaborators, many did not initially embrace the term "champion." Still, the researcher assumes that participants openly shared their stories without a great amount of filtering and the findings show a sufficient breadth and depth of data resulting from the interviews.

Definition of Terms

Bracketing: As defined by Husserl, bracketing (also known as epoché) is the act of suspending personal judgment about events and environments in order to investigate with a fresh perspective (Creswell, 2007, p. 80).

CME: The term CME stands for continuing medical education, which is primarily aimed at physicians and advanced practitioners. In 1992, this definition was expanded to include educational offerings provided through computer-mediated communication (Mazmanian & Davis, 2002). For the purposes of this research, it is a general term that includes all post-graduate medical education.

Homogeneous Sampling: In phenomenological research, the term refers to the practice of selecting small samples of similarly oriented or impacted individuals (Smith et al., 2009, p. 49).

Patient-Centered Medical Home (PCMH): The PCMH model of patient care aims to create a continuum of care for patients within a primary care practice or among primary care and special practices in a local community. The care patients receive is better coordinated, more efficient and focused on disease prevention and management (Leventhal, Taliaferro, Wong, Hughes, & Mun, 2012).

Telehealth: Telehealth (derived from telemedicine terminology) is the use of computer-mediated communication to facilitate the healthcare of patients, formative and continuing education of providers and medical research protocols across distance and/or time (Maheu et al., 2002).

Telemetry: The remote collection of clinical and psychological data using a device that communicates between the patient and provider (Demiris et al., 2011).

Chapter Summary

In this chapter, the increasingly transformative nature of telehealth networks has been introduced. The essential role played by telehealth champions in the establishment, expansion and sustainability of these network has also been described. This chapter

outlined previous research looking at the challenges inherent in the adoption of telehealth technologies. The relevance and significance are based on the need to better understand how telehealth champions can positively affect issues around access to high-quality healthcare. The goal of this study was to understand the individual champions' lived experiences within telehealth networks. As presented, there are three main research areas that would identify the human elements necessary for successful telehealth networks, explore the way champions are empowered and understand how champions translate their experiences to overcome challenges. Also included is a brief examination of the literature from previous research, the stance of the researcher within this study, barriers and issues that are addressed, limitations and delimitations of the research methodology, and definitions of key terms.

Chapter 2

Review of the Literature

Introduction

The following chapter is a review of the current literature in a number of related content areas including: medicine, health professions, telemedicine/telehealth, computer-mediated communication, continuing medical education, online learning, information systems and qualitative research. These content areas are reviewed in order to ensure the advancement of a relevant research area supported by the literature. The resulting peer-reviewed findings served as a basis for the goals, research questions and methodology of the research study.

Given the complex nature of telehealth networks, trends and research from multiple perspectives are examined including journals that report clinical, educational and technological research findings. Given the pace of change associated with the implementation of telehealth networks, particular attention has been given to recently published studies that present the most current findings (in general, articles less than five years since publication are included). Beyond the journal's status as a peer-reviewed publication addressing one of the previously identified content areas, there are no other criteria for inclusion or exclusion.

Sub-sections explore the literature related to diffusion of innovation theory, how telehealth has evolved, the processes of change occurring, the particular elements that are facilitated by emerging technologies, the role of education in the deployment of networks, and the support required by information technology personnel. This chapter

concludes with a thorough examination of the use of interpretative phenomenological analysis to study healthcare and telehealth champions.

Diffusion of Innovation

The theory of the diffusion of innovation, as modeled by Rogers (2003), defines diffusion as the communication of special types of information through channels within social systems over a period of time. While the term "diffusion" denotes revolutionary change through the unplanned and spontaneous dissemination of new ideas, those ideas must be clearly advantageous for diffusion and adoption to take place. The author cites numerous examples from medical discoveries (e.g., citrus prevents scurvy on long ocean voyages) and technological innovations (e.g., the Dvorak keyboard which was designed based on observed patterns of user inputs instead of the need to reduce the sticking of typewriter keys) to illustrate that the diffusion and adoption of innovations are not simply instinctive. Instead, Rogers (2003) notes that individuals' perceive five characteristics of innovation that contribute to adoption: relative advantage, compatibility, complexity, trialability and observability.

Within studies focused on computer-mediated communication through telehealth applications, researchers have examined the characteristics identified by Rogers in order to hasten the diffusion of innovation and achieve greater adoption of technological advancements. Studies by Gammon, Johannessen, Sørensen, Wynn and Whitten (2008), Gattoni and Tenzek (2010), and Maarop and Win (2012) have used qualitative and mixed-methods approaches to examine the foundational theories used in telehealth research. In Gammon et al. (2008), the authors identified Rogers' theory as the predominate concept used by researchers publishing telehealth studies that were based on

theoretical concepts. To a greater extent within the 83 articles reviewed by the authors, the diffusion of innovation model helped to predict and explain the variety of ways that telehealth applications were being adopted through a better understanding of the complex issues that affect the deployment of healthcare-based technologies. The loose use of multiple types of theories and concepts based on health behavior, science and technology and economics led the authors to conclude that telehealth is "a field in search of an identity" (Gammon et al., 2008, p. 260).

Maarop and Win (2012) also researched the acceptance (diffusion and adoption) of telehealth applications through qualitative and quantitative studies. Through key informant interviews with telehealth champions (n=20) and surveys of medical staff members (n=72), the authors determined that the acceptance of the technology was statistically associated with the need being filled by the technology and not exclusively based on the attributes of the technology. In addition, their findings correspond with Rogers' model related to the identification of objective reasons for implementation. First, there has to be a *need for service* that results in better access to specialists, utilization of resources, reduction in mortality and morbidity and improvement in the management of the patient's care. Next, there has to be a *perception of usefulness* related to the technology – like faster access to patient information or easier coordination of communication. Last, *the ease of use of the technology* from the participants' standpoint must result in a system that is easy to use and learn, clear and understandable, free of complexity and without a delay in response. This study was unique in that the researchers specifically identified "champions" as a separate group of users and

approached the collection of data from them using a qualitative interview method that produced rich narratives.

Gattoni and Tenzek (2010) utilized Rogers' theoretical framework to "explain how providers adopt telemedicine" (p. 265) and to identify the barriers facing organizations and individuals. Their exploration of telehealth implementation through Rogers' framework yielded several barriers for adoption including: *lack of telecompetence* (addressable through training and process refinement); *provider resistance* (resistance, overtly and subtly, by both providers and patients); and *trust* (established though the use of the technology to support strategic interventions). To address each of the perceived barriers and prevent their emergence in the deployment of new telehealth applications, the authors recommended the use of education to build competence, knowledge and trust between patients and providers and aid in the diffusion of innovation.

Rogers (2003) concludes that an individual's adoption occurs based on a person's analysis of a critical mass of other individuals' experience with the technology. Only then does the participation of individuals affect the critical mass at the system-level increasing the pace of diffusion and adoption. Because individuals serve as change agents within and across organizations, it appears that the use of Rogers' theory to study telehealth networks and champions has proven to be a valuable theoretical framework. Going forward, research into the adoption and diffusion of telehealth applications could delve deeper into the individual champions' ability to push through issues surrounding the characteristics of innovation as identified by Rogers.

Evolution of Telehealth

Almost two decades after Dr. Michael DeBakey introduced the inaugural volume of the *Telemedicine Journal* (now known as *Telemedicine and e-Health*) with the assertion that "telemedicine has now come of age" (DeBakey, 1995), telemedicine remains in a steep climb towards its promise of adoption and diffusion. As reported by Moore (1999), what started in its earliest form as ship-to-shore communications in the 1920s, evolved with the advent of broadcast television in the 1940s and 1950s to later include satellite transmissions across the globe and to astronauts in outer space.

The origin of the terms telemedicine and telehealth can both be traced back to the 1970s and refer specifically to the use of technology to facilitate patient care (Bennett, Rappaport, Skinner, & National Center for Health Services Research & Mitre Corporation, 1978). Telehealth is considered to be an expansion on the term telemedicine to also include the provision of care by other healthcare providers (i.e. nurses and therapists), as well as the provision of educational and research activities (Maheu et al., 2002, p. 2). Today, the two terms are used interchangeably and reflect a shift to an overarching focus on improving population health.

The processes and technologies that support telehealth are complex, highly structured and dependent on the specific needs of the patient. Vuononvirta et al. (2011) raised similar questions about the concept of compatibility of telehealth within the established medical delivery system. A significant change in the way healthcare is provided or supported through technology inevitably creates organizational and individual strife. Is the technology compatible from the viewpoint of patients and providers and within the healthcare processes of a system? The authors stressed the

importance for telehealth applications to maintain fluent processes - like communication, record keeping and diagnostics - through implementations that were aligned with the organizational culture and healthcare in general. The integration must feel compatible and beneficial to all involved.

Zanaboni and Lettieri (2011) questioned the role of regulation and policy on the advancement of telehealth systems. They argued that decisions made by individual programs and centers would be implemented faster and with greater confidence if a large-scale mandate existed that provided direction and support. Mandates, or at the minimum, supporting legislation, were seen as essential to providing rewards and penalties that can rapidly affect organizational priorities. An example of a powerful mandate was the deployment of electronic health record systems and the corresponding financial incentives and penalties at the federal level that have sped the adoption of technological and clinical process changes by healthcare providers.

The Process of Change

Staff expectations regarding electronic applications have also been studied and show that complex relationships exist between people, technology and systems that are undergoing a change process (Marchesoni, Lindberg, & Axelsson, 2012). The authors constructed an ethnographic study of the pre-implementation expectations of healthcare professionals preparing for new health information technologies. Participants understood the reason for the changes and, in some instances, were enthusiastic about the technology, but most remained skeptical about the transformative nature of the new processes. Participating staff reported a lack of empowerment to learn the new technology as well as

a lack of empowerment to help patients embrace the technology. Each of these factors creates challenges and prevents smooth implementations of telehealth systems.

Vuononvirta et al. (2009) also established the need to account for users at varying stages of telehealth readiness. The authors took into consideration the viewpoints of multiple specialties and service lines participating in telehealth activities. After qualitatively observing and interviewing 30 healthcare professionals within a health system, they concluded that although professionals regarded the technology as a positive development in their practice, it was only though significant organization and communication (at all levels) that challenges could be addressed. Participant attitudes ranged from negative to hesitant to enthusiastic. Even starting from a positive mindset, healthcare professionals needed tangible support and leadership to make their efforts successful.

Standing, Volpe, Standing, and Gururajan (2011) concluded that frameworks that capitalize on the *virtual expertise* of team members were needed to facilitate knowledge sharing. By effectively managing the changes brought about by new technologies, humans and systems were more likely to be successful. Upon the completion of a literature review for studies that detailed successful implementations, the authors determined several main points of impact. Specifically, the quality of the interfaces, information, knowledge and exchanges determined how decisions were made and implemented within existing networks. Developing new frameworks to help healthcare teams achieve their goals while affecting organizational change is a possible area of improvement for future networks.

Technological Elements

As Meyer, Clarke, Troke, and Friedman (2012) examined, there are numerous elements or *"tele-ments"* to consider in the development of telehealth networks that extend past academic health centers (AHC). These included defining the vision of an organization, putting in place an infrastructure that can facilitate telehealth, developing policies and procedures that uniquely address the nature of telehealth, cultivating relationships within and through the AHC and partner institutions, addressing broader issues such as licensure and privileging, and implementing educational programs to support and train providers. Most importantly, the *human element* plays a vitally significant role in the success of any network.

Meyer et al. (2012) also framed the use of telehealth as an integrated system of care not outside the current service delivery lines of AHCs. In their analysis of the steps required for successful implementation, they spoke directly to the need to involve both IT and clinical staff in the establishment of services through a comprehensive needs assessment. Also, they proposed that training occur at both the hub and spoke locations and within each staff or provider level. Unfortunately, the authors cited the need for individual telehealth champions at the spoke and hub location, but they did not identify how telehealth champions were selected or cultivated.

Based on the concept of collaboration between AHC clinical hubs and community spoke partners, this study sought to understand the lived experiences of telehealth champions within both environments and across the three champion areas as presented in Figure 2.1. Clinicians, educators and technical support staffs at the hub and spoke locations were studied to better understand how they were able to overcome changes in

their practice and support new systems of clinical and education delivery. Although patients and vendors serve as important catalysts within telehealth networks, their bearing on the adoption and diffusion of applications was not examined as part of this study.

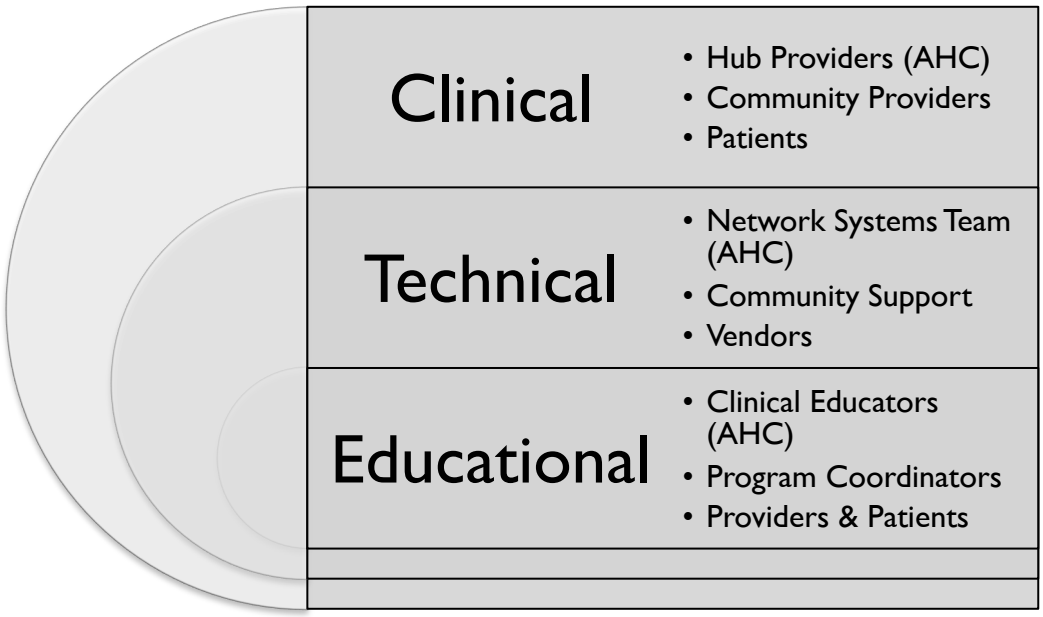


Figure 2.1. Highly Dependent, Collaborative and Interrelated Human Elements within Telehealth Networks

Tele-Education

The art and practice of healthcare necessitates the continued exploration and acquisition of medical knowledge. Although healthcare professionals complete years of formal training, healthcare is an evolving field with continuous advances and quality refinements that must be incorporated into healthcare processes (Bachmann, Cantoni, Coyne, Mazzola, & McLaughlin, 2010).

Important considerations pertaining to the provision of healthcare include the use of technology to improve patient care, reduce costs and expand service access for patients (Gattoni & Tenzek, 2010). While describing the transformative nature of technology in healthcare, the authors call for an increased use of technology to support the educational

needs of healthcare providers. Greater access to information through technology potentially offers solutions to the challenges seen in the current systems of care. The use of technology through telehealth (clinical, educational and research) systems can change the inherent relationships within healthcare where communication is essential and geography is a significant factor.

Geography is a consideration that cannot be overemphasized in the practice of medicine. The continuing medical education (CME) needs of rural physicians are different from those practicing in more resource rich areas (Curran, Fleet, & Kirby, 2006; Curran, Rourke, & Snow, 2010). Due to the professional isolation many practitioners experience in rural areas, the authors in both studies reflect on the professionals' needs to have a wider depth of knowledge to care for their communities. The changes being brought forward by the expansion of telehealth networks across geographic barriers is a mixed blessing. With increased access to primary and specialty care, comes the need for a more technologically savvy healthcare workforce. The authors conclude that implementing e-learning environments and new models of education are essential to recruiting and retaining rural physicians.

Concerns exist about the use of technologies and the best methods for incorporating new technical tools into the learning environment. As Bachmann et al. (2010) indicate, creating new e-learning opportunities does not guarantee successful adoption by healthcare professionals. Given the powerful nature of technology, it is also important to support educators and learners as they address technological trends and changes in expectations. Trends identified by Robin, McNeil, Cook, Agarwal, and Singhal (2011) include the rapid growth in the amount of knowledge available to practitioners and

patients, the access to that information through digital means, and a new generation of learners who have been immersed in technology throughout their lifetimes. Technologies will also be capable of providing new methods of delivery (some of which are unimagined at this moment) and will undergo changes at a faster rate.

Good examples of these trends are evident within the medical community. Healthcare professionals are expected to maintain professional credentials through the regular completion of continuing education courses. These courses are seen as an essential strategy to help providers maintain their skill sets while being kept informed about new knowledge (Moore & Kearsley, 2011, p. 62). The importance of CME for physicians is codified as a mandatory requirement for their re-licensure in 61 U.S. states and territories. Moore and Kearsley (2011) point to a shift from in-person courses to those offered online as a way to address the limited time many health professionals have for training, provide the benefits of integrating new knowledge about patient care immediately into daily practice and individualize the training to meet the specific needs of providers. Schleyer et al. (2012) advocate for the use of technology to equal the balance of power between faculty and students, and the use of technology to provide evidence-based teaching.

Effective tele-education serves as the gateway for other telehealth initiatives. As telehealth efforts gain traction and are integrated throughout various healthcare settings, the need for quality, tailored educational interventions are essential to supporting clinical activities and healthcare professionals undergoing practice changes (Gattoni & Tenzek, 2010). To implement a sustainable telehealth system, education and training have to occur at all personnel levels and multiple content areas. Administrators, clinicians,

educators and patients need instruction not only to use the equipment properly, but also to successfully conduct sessions and incorporate proper video etiquette.

Information Technology Support

Often working behind the scenes, specially trained IT personnel who can navigate layers of complex technical systems are needed to support telehealth networks. Surprisingly, little research exists to describe the role of IT personnel in telehealth, their perceptions of the challenges and successes, or how to effectively utilize their skills in the development and support of telehealth networks.

However, a broader base of research exists in the area of models for the adoption of technology. Moore (2004) presents the concept of the innovation gap and details the obstacles *IT-based innovations* face at each stage of adoption and implementation. According to Moore, there are numerous types of innovation including: disruptive, application, product, process, experiential, marketing, business model and structural. Within the context of a product lifecycle, the combined examination of these distinct types of innovation can be seen in something the author refers to as the *technology adoption life cycle.* At any time during the development of an innovation, adoption can be delayed or denied based on the perceived needs of the customers and external influences like competing products and services. Often towards the beginning of the cycle, there is a chasm that must be overcome to achieve widespread adoption. The author also emphasizes that simultaneous processes of creation and destruction occur as the life cycle progresses. Managing these processes takes the focus of the *right leader* for the right point in the cycle. While Moore (2004) does not specifically examine the

adoption cycle of telehealth systems, his points about aligning personnel to phases and recognizing a path of innovation are applicable to telehealth systems.

As a case in point, Cho et al. (2009) detail a longitudinal study of a telestroke program and present a model of innovation from the perspective of the inventor. "The authors offer a process model of this telehealth innovation consisting of four phases: invention, pilot test, commercialization, and penetration – with each phase demarcated by specific actors and activities" (Cho et al., 2009, p. 351). Within the invention phase, the authors detail the creation of a telestroke program, REACH (which stands for remote evaluation of acute ischemic stroke), from concept to actual telehealth consultation. At this point, the neurologists served as "project champions, end-users and also managers of the software development process" (Cho et al., 2009, p. 356). This is one of few studies that actually focus on champions in the context of how health professionals immerse themselves in the technology. By immersing themselves in the development and deployment of the telestroke network, the neurologists received first hand knowledge about the user experience, hospital processes and path forward. They also helped to address technical issues and extended their professional relationships through the education of medical staffs at rural hospitals.

These experiences helped REACH move through the chasm (Moore, 2004) described and enter the pilot stage. Within this stage, "the limited IT resources at rural hospitals surfaced as a serious problem" (Cho et al., 2009, p. 358). This issue cannot be underestimated for this specific telehealth application or any others. Without adequate personnel resources within the entire network, issues have to be addressed from a distance, which adds time, frustration and complexity into the process. External factors

also surfaced within this phase, like reimbursement for clinical consults by private and federal insurance plans and the cost of broadband connectivity for participating hospitals. While each issue required a solution that allowed REACH to move forward, the technical personnel issue was not easily solved with new legislation or a better-defined business model.

By the time REACH arrived at the stage of penetration, the firm was focused mainly on technical and systems development that would allow it to grow and marketing efforts that would help promote the innovation (Cho et al., 2009). Technical personnel gained in importance over the life of the process while clinical personnel slowly stepped out of the daily operations. At every step in the process, the inventors were forced to continue innovating in order to build and expand telehealth services.

Cho et al. (2009) recommend accommodating the specific technology infrastructure needs that evolve at rural spoke locations. "Recognizing rural hospital constraints, both in terms of technology and expertise, will facilitate adoption during the pilot test phase and pave the way for successful diffusion within the broader marketplace" (Cho et al., 2009, p. 363). Regardless, the role of IT personnel within the creation and deployment of telehealth applications is an area of great importance but sparse research.

Previous Areas of Telehealth Research

In the past, telehealth researchers have focused on areas of clinician and patient satisfaction (Demiris et al., 2011) or what has been identified as "the key challenges associated with telehealth projects" (Joseph et al., 2011, p. 71). Demiris et al. (2011) found through a review of the literature on human factors that there has been little focus on evidence-based recommendations that can help to inform telehealth networks.

Gammon et al. (2008) reported the study of telehealth has been largely conducted without a dominant methodological theory. In their review of published studies from 1990-2005, the authors found that only 5% of the articles indicated a theoretical concept. Of those with an identified theory, mostly grounded theory procedures were used to conceptualize theories, with descriptive statistics providing supplemental information. They question the uniqueness of telehealth as a field and are troubled because it is not being examined through the lens of the academically established theories grounded in the physical, social and computer sciences.

Rigorous qualitative studies about the impact of telehealth activities on patients, providers and communities (Marchesoni et al., 2012; Thapa, 2011; Vuononvirta et al., 2009) have become more prevalent in the literature. Studies, like Vuononvirta et al. (2009) and Maarop and Win (2012), focused on the experiences specific clinical disciplines (physicians, nurses, therapists) have in the deployment of telehealth networks (see Table 2.1). Others, like Zanaboni and Wootton (2012) focused primarily on the organizational factors and processes that affect adoption. Absent from the literature are qualitative studies, especially phenomenological inquires, about the champions (clinical, educational and technical) who make these systems possible.

Table 2.1. Related Qualitative Studies of Telehealth

Study Title	Authors	Date	Samples Studied	Study Method	Number of Samples
An overview and analysis of theories employed in telemedicine studies	Gammon, D. Johannessen, L. K. Sørensen, T. Wynn, R. Whitten, P.	2008	Peer-Reviewed Articles	Grounded Theory	83
The attitudes of multiprofessional teams to telehealth adoption in northern Finland health centres	Vuononvirta, Tiina Timonen, Markku Keinänen-Kiukaanniemi, Sirkka Timonen, Olavi Ylitalo, Kirsti Kanste, Outi Taanila, Anja	2009	Physicians Nurses Psychiatric nurses Physiotherapists	Case-Study	30
Crossing the diffusion chasm: From invention to penetration of a telehealth innovation	Cho, Sunyoung Mathiassen, Lars Gallivan, Michael	2009	Nurses Physicians Administrative Staff IT Staff Radiology Technician	Case-Study	26
Telemedicine: A practice-based approach to technology	Gherardi, Silvia	2010	Cardiologists	Ethnographic	70
Key challenges in the development and implementation of telehealth projects	Joseph, Victor West, Robert M Shickle, Darren Keen, Justin Clamp, Susan	2011	Undefined Key Informants at Health or Local Authority Organizations	Grounded Theory	13
The compatibility of telehealth with health-care delivery	Vuononvirta, Tiina Timonen, Markku Keinänen-Kiukaanniemi, Sirkka Timonen, Olavi Ylitalo, Kirsti Kanste, Outi Taanila, Anja	2011	General Practitioners Specialist Physicians Nurses (Outpatient Unit) Public Health Nurses Psychiatric Nurses Physiotherapists	Case-Study	55
Understanding the need of health care providers for teleconsultation and technological attributes in relation to the acceptance of teleconsultation in Malaysia: A mixed methods study	Maarop, Nurazean Win, Khin Than	2012	Healthcare Providers	Mixed Methods: Qualitative/ Quantitative	20 / 72

Within phenomenological research, there are applicable methodologies for the study of medicine. As Carel (2011) asserted, phenomenological research is beneficial for examining environments (e.g., clinical practices) and the experiences of patients

confronting illness (e.g., mental health). In addition to describing phenomenological methodology as being underutilized in the philosophy, training and practice of medicine, Carel (2011) cites the benefits of these methodologies to help establish efficacy and improve patient care. Smith, Larkin, and Flowers (2009, p. 160) also mentioned its usefulness in examining the perspectives of healthcare professionals - especially related to determining variations in clinical decision-making.

Introduction to Interpretative Phenomenological Analysis

For this study, the researcher utilized an interpretative phenomenological analysis (IPA) methodology as outlined by Smith et al. (2009). IPA is a relatively new theoretical approach to qualitative research based on the founding principles set forth by Husserl and refined by Heidegger, Merleau-Ponty and Sartre (Smith et al., 2009, p. 21). Based on the principles of physiological research, IPA is unique because it includes three key elements: phenomenology, hermeneutics and ideography.

The first element, phenomenology, is based on the theory that experiences should be examined within the contexts, processes and terms in which they occur (Smith et al., 2009, p. 12). The act of examining the human experience involves exploring events as they were experienced, remembered and reflected upon by the individual. As proposed by Husserl, the findings describe the essence of the event as reduced or derived from the individual's larger experience. Figure 2.2 provides an overview of this iterative process.

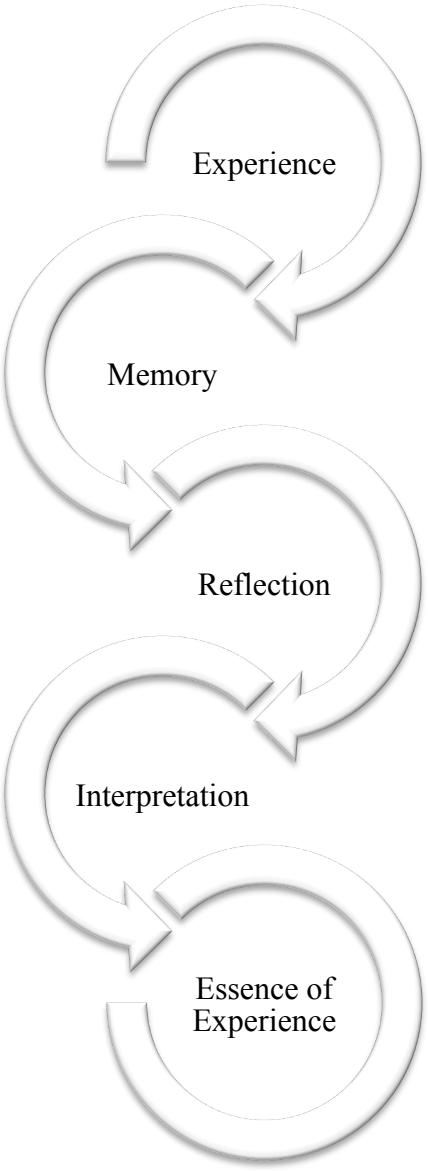


Figure 2.2. The Lived Experiences of Participants as Extracted Through IPA: An Iterative Approach

Smith et al. (2009, p. 21) named hermeneutics as "the second major theoretical underpinning of IPA." Creswell (2007) described the hermeneutical approach, attributed to Max van Manen, as reflecting on the essential themes of a lived experience. This perspective was provided through the interpretation of the documentation of life (journals, accounts, verbal stories, and photographs) as analyzed by the researcher. The

interpretations were mainly the result of the researcher's conscious actions to engage in a process of understanding. For Heidegger, phenomenology was a way to bring hidden things into the light through interpretative work that sufficiently brackets out the researcher's previous experience.

Idiography is the final major influence within IPA. Smith et al. (2009, p. 29) described the use of "small, purposively-selected and carefully-situated samples" to discern details specific to particular people in particular situations. These perspectives are not focused primarily at the individual level, but they instead seek to capture the uniqueness of the phenomenon from a collective or relational standpoint. The influence of idiography can be seen in the complex examination of phenomena from the worldly or relational perspective as it was singularly experienced.

Rationale for Choosing IPA

Currently, there are a limited number of IPA published studies within the field of medicine. Although one study by Bulley, Shiels, Wilkie, and Salisbury (2010) used IPA to explore the experiences of stroke patient caregivers, and another study by Murtuza and Bakshi (2012) explored the use of information technology by medical staffs, the researcher was unable to locate a specific study about the use of IPA with telehealth champions. By applying IPA to a study about three distinct groups of champions, seven themes have emerged that show how these champions were successful in overcoming barriers to the adoption of telehealth systems and what it means to be a telehealth champion.

Smith et al. (2009, p. 32) define IPA as, "concerned with the detailed examination of human lived experience." The authors presented the major procedural steps used in IPA

research as a way to answer questions about the personal meaning of shared experiences, which have a particular focus. The first step involved planning an IPA study based on a topic area of interest, an alignment with the IPA approach that makes the best sense of the experience (Can we answer the research questions utilizing this method?), and research questions that can be grounded in an epistemological position. At issue is what the individuals' understanding of their experiences reveals about their lived experiences.

In this instance, the researcher conducted a study on the experiences of telehealth champions who have successfully adopted, utilized and supported telehealth networks. Although several studies appear in the literature about the experiences of clinical professionals taking part in the creation of telehealth networks (Vuononvirta et al., 2009; Whitten & Holtz, 2008; Zanaboni & Lettieri, 2011), these studies do not examine the role of telehealth champions in the process and they do not adequately include the perspectives of non-clinical personnel.

A considerable body of work exists supporting the need for continued development in the technical and organizational structures associated with telehealth (Légaré et al., 2010; Standing et al., 2011; Vuononvirta et al., 2011; Zanaboni & Wootton, 2012). While researchers, notably Joseph et al. (2011) and Meyer et al. (2012), tout champions as essential to telehealth applications, none explore how the experiences of those champions affected the deployment of new services. Most importantly, these studies lacked recommendations on how to translate the experiences and motivations of telehealth champions to the adoption and diffusion of new applications.

Based on these findings within the literature, the experiences of telehealth champions were of interest and importance to study since it is hoped that the research provides

useful findings that can be used to advance telehealth adoption and diffusion. Empirical data does not explain the differences in outcomes between similar telehealth applications or explain the distinctly human elements that help applications become successful. Moreover, these explanations appear to be beyond the purely observational capacity of a researcher and require first person reports.

Background of IPA

While phenomenological research can be traced to the writings of Socrates (Vivilaki & Johnson, 2008) the modern day founder of the discipline and the "father of the influential Twentieth-Century movement of phenomenological philosophy and psychology" is recognized as Edmund Husserl who lived from 1859-1938 (Smith & McIntyre, 1982, p. xiii). According to Smith and McIntyre (1982), Husserl was a Czech-German philosopher who was the first to construct a theory that was grounded in studies of the first-person perspective. By analyzing the described experiences of those involved in an event or process, Husserl thought it was possible to extract common streams of consciousness and explore the intentionality of the human mind towards perceived meaning.

The more recent development of interpretative phenomenological analysis (IPA) is the result of a paper published by Jonathan Smith in 1996 in *Psychology and Health* (Smith et al., 2009). This paper "argued for an approach to psychology which was able to capture the experiential and qualitative, and which could still dialogue with mainstream psychology" (p. 4). Smith argued that qualitative research could be "both experimental and experiential" (p. 4) while reflecting on essential themes. Although IPA started in psychology, it has diversified to include many aspects of clinical, social and

educational psychology. The focus remains on the human predicament and how people engage in the world.

Smith et al. (2009) welcome the expansion of IPA into the more human and social sciences in order to speak to the psychological aspects of other disciplines. The expansion of IPA stems from early work that originated in the United Kingdom and now includes many areas of the world with non-English speaking populations. For Smith et al. (2009), IPA is not the only qualitative research method based on the principles of phenomenology and is viewed as an un-fixed area of applied research.

Although research studies have examined telehealth through the lens of phenomenological studies (Dolezal, 2009; Haans & IJsselsteijn, 2012; Marchesoni et al., 2012), most have focused on the types of technologies and institutional processes that affect implementation and sustainability. Current research has not widely utilized IPA as a qualitative method in telehealth studies.

In the study by Dolezal (2009), the author explores the use of *telepresence* as an immerse videoconferencing experience. Dolezal states:

> "…I will focus on the phenomenological questions that arise when considering telepresence, in particular questions regarding agency and ownership of action, the limits of the corporeal schema, situatedness, the possibility of re-embodiment and intercorporeality. The case of telesurgery, where invasive surgical procedures are performed remotely, will be examined in order to demonstrate the quality and characteristics of these phenomenological issues" (pp. 210-211).

Additional telepresence research by Haans and IJsselsteijn (2012) describes the phenomenon of telepresence through a proposed theoretical framework developed by the authors. They conclude:

> "Our framework makes a distinction between two types of incorporations: Functional extensions of the body (through incorporation in the body

> schema) and phenomenological extensions of the self (through incorporation in the body image)" (p. 216)….and…"Tools and technologies are but additional mediators, which when appropriately integrated in our embodiment yield the same transparency that we experience when using our own natural sensors and actuators or, in a word, our bodies" (p.217).

Phenomenological research by Marchesoni et al. (2012) sought "to obtain knowledge about staff expectations of ICT [information and communication technology] before implementation"…while "also considering ongoing organizational changes" (p. 209). Interviews with 23 staff members across two municipalities resulted in rich data that helped to capture the experiences of the individuals with the following results:

> "Staff in this study emphasized the changes that affected them at a revolutionary level—new legislation and competition—while the electronic applications affected staff on the evolutionary level. The results of this study also provide broad insight into how staff members depend on previous experiences when changes are taking place. Looking back on past experiences in relation to the overall situation in the workplace can help motivate staff and better explain their present perspective" (Marchesoni et al., p. 217).

IPA Concepts and Terms

There are several important definitions of terms and concepts within IPA. The first, epoché or bracketing, as defined by Creswell (2007, p. 80) is when "investigators set aside their experiences, as much as possible, to take a fresh perspective towards the phenomenon under investigation." Bracketing is an ongoing process for researchers during each stage of the study.

Within the analysis of IPA data, there are several levels of notation that are used to capture descriptive, linguistic and conceptual comments (Smith et al., 2009, pp. 84–90). Descriptive comments are defined as the identification of key words and phrases along with explanations provided by the respondent. From there, linguistic comments, or those

pertaining to the language used by the respondent are identified. Finally, the more interpretative level of analysis that examines the data at a conceptual level, is conducted to provide meaning through a shift toward the "participant's overarching understanding of the matters that they are discussing" (p. 88).

Smith et al., 2009 (pp. 96–99) provide several processes that might be useful in the analysis of data. They include: *abstraction*, which involves identifying patterns between themes by grouping similar themes; *subsumption*, which uses an emerging theme to "bring together a series of related themes"; *polarization*, which examines opposite relationships in order to determine themes; *contextualization*, which uses narrative elements such as events to shape the understanding of a theme; *numeration*, which uses frequency counts (often quantitative) to account for the relevance of the theme; and finally *function*, which examines the relationship of the intertwined meaning and thoughts of a participant in order to gain a context of the experience. Various combinations of these processes can be employed when analyzing IPA data.

IPA Over Other Qualitative Methods

Even though telehealth is an outgrowth of the theories and technologies categorized as computer-mediated communication, its adoption and diffusion has been slow and uneven (Zanaboni & Wootton, 2012). The literature explicitly identifies the need for telehealth champions to be agents of change within complex health organizations and systems, but it provides little explanation for how best to accomplish these tasks (Gagnon et al., 2012; Joseph et al., 2011; Singh et al., 2010). Unlike other qualitative research methodologies that have been examined as part of this review, IPA allows for the micro examination of the unique lived experiences of telehealth champions as a result of their

participation in the phenomenon known as telehealth. Specifically, IPA provides an opportunity for participants (in this study *champions*) to reflect upon their personal experiences, engage in the interpretation of their experiences, and focus on a specific instance within their experiences (Smith et al., 2009, pp. 32–37).

Smith et al. (2009) draw clear distinctions between studies conducted using IPA and those based on grounded theory (p. 201). Unlike in grounded theory studies, this study did not utilize fieldwork for data collection, apply systemized frameworks for analysis or seek to develop a "theoretical-level account" around a broad topic (p. 201). Given the proposed purposive sample of participants in this study, the relatively limited sampling pool from which participants were drawn and the focus on the analysis of champions within telehealth applications, the guidelines provided by the authors indicated that IPA was considered an appropriate method for this research study.

Computer-Mediated Interviewing

Previous qualitative studies examining computer-mediated communication have been performed utilizing a variety of communications methods for interviews including the telephone (Jennett et al., 2005; Joseph et al., 2011) and videoconferencing systems (Glassmeyer & Dibbs, 2012; Sedgwick et al., 2009). While each of the authors have deployed unique communication methods within their research studies, findings indicate that with proper planning and implementation, computer-mediated communication provided satisfactory collection of data for their research purposes.

An example of common technologies used to conduct interviews can be found in the study conducted by Jennett et al. (2005). In investigating the telehealth readiness of rural communities, the authors conducted semi-structured telephone interviews with four key

informants across rural Canada. While the authors successfully met their research objectives in determining "four types of telehealth readiness for organizations within rural communities" (Jennett et al., 2005, p. 138), the data collection method used in the study, the telephone, was not found to be a significant element in the process.

Joseph et al. (2011) also utilized semi-structured telephone interviews with telehealth organizations across England to identify challenges in their development and implementation of telehealth projects. Again, the telephone was successfully used to collect data from leaders within 13 healthcare organizations. As part of their research, Joseph et al. (2011) identified the proper use of telephone technology as one of the important components of modern telehealth applications – both in terms of the provision of clinical care and the support and maintenance associated with the project.

With the rise of video-based communications that more closely resemble face-to-face interactions, research studies are also being conducted to determine the effectiveness of the medium for qualitative data collection. Sedgwick et al. (2009) conducted a focused ethnographic study with preceptors and undergraduate nursing students who had participated in rural clinical experiences. Over the course of 26 semi-structured interviews with nursing students (12) and preceptors (6), the authors explored the experiences of these participants while working in rural hospitals across Canada. The authors admitted to defaulting to videoconferencing as an interviewing method because of time, weather and economic reasons. Their study findings were based on the rich data they derived form the verbal and nonverbal communication, the natural use of language by the participants and the immediate feedback of that communication provided by the videoconferencing system. The disadvantages identified included the challenges

associated with conveying compassion and establishing trust. The authors concluded that videoconferencing is "an excellent medium to conduct face-to-face interviews with participants who were geographically dispersed" (Sedgwick et al., 2009, p. 8) and collecting data through videoconferencing is reflective of the larger changes in communication occurring through the development of technology.

Subsequent research by Glassmeyer and Dibbs (2012) examined the use of technology already in place as part of online education for university students in order to collect data related to the course. Although the original intent of the study was to examine learners' experiences within the course, the use of videoconferencing to facilitate the data collection was an outgrowth of the established method of communication for the course. The authors clearly identified several ethical concerns that had to be addressed in conducting interviews through videoconferencing: recorded data privacy in online environments; interviewee privacy based on disruptions from others entering the environment; and the identified presence of a note taker for each session. In the end, they recommended the use of the technology after careful planning and consideration of how the processes translate from the real world to a virtual environment.

Immersing oneself in the technology that is being researched has allowed for the study of other virtual environments like Second Life ("Secondlife.com," 2012). Webber (2013) specifically utilized this type of immersion to study how people sought and used information within Second Life. The findings of this study were derived from inductive analysis that had been made possible by the constructs of the environment in which the data were collected. Similar immersions within telehealth networks would be in line with

the current usage of the technology to facilitate high-levels of communication already occurring on a daily basis.

The use of virtual communication tools to conduct research and provide clinical services is growing in its acceptance. Entire psychotherapeutic interventions, synonymous with complicated interpersonal communication, are now taking place online through videoconferencing applications (Tosone, 2013). Videoconferences are being used specifically to promote active learning by bridging the transactional distance within online learning environments (Rodrigo et al., 2010). That same distance reduces when two parties are engaged in trust-based communication through modern videoconferencing systems.

The natural inclination is for humans to communicate utilizing the methods at their disposal. The videoconferencing system utilized in this study exceeded the capabilities described by studies in the literature and is described in detail within the "Instrumentation" section of Chapter 3.

Chapter Summary

Given the multiple disciplines and topics areas involved in successful telehealth networks, a significant breadth and depth of literature were reviewed within this chapter. The theoretical underpinnings of the diffusion of innovation theory was explored along with the evolution of telehealth, the processes of change occurring, relevant technological elements, the integration of educational foundations, and support provided by the information technology community. A thorough examination of the research methodology known as interpretative phenomenological analysis (IPA) was presented along with examples of its use to research health related questions. In conclusion, the use

of computer-mediated communication was explored as a viable method for data collection for qualitative studies.

In the case of telehealth champions, they may or may not have had access to the resources and training needed to positively affect their perceptions of telehealth (Vuononvirta et al., 2009) or support their roles within telehealth networks. Based on the review of literature, determining how champions utilized their skills to advance their networks proved to be a worthy research question.

Chapter 3

Methodology

Introduction

The previous review of the literature highlighted a significant gap in the research examining the lived experiences of telehealth champions. In this chapter, the framework for achieving the study aims is established through the exploration of research methodologies, study processes and instrumentation, and resource requirements. The processes for collecting, validating, analyzing and presenting data are also presented. At the conclusion of this chapter, the researcher summarizes the methodology utilized to conduct an interpretative phenomenological analysis of telehealth champions.

Research Method

Qualitative research is being viewed as an essential component in medical science inquiry and disease process management. Phenomenological research helps to provide context for a variety of inputs including measurements and observations, while accounting for the participants' backgrounds and experiences that have a direct bearing on the decision-making process (Carel, 2011). Within the science of medicine, the processes of physical and mental healing are classic instances of individual experiences that coalesce around central themes of loss, grieving, hope and triumph.

Since the researcher sought to explore in detail the lived experiences of telehealth champions, interpretative phenomenological analysis (IPA) was employed to examine the processes of adoption, diffusion and sustainability for clinicians, educators and technical staff within a telehealth network. Specifically, the researcher sought to understand the perspectives of a small sample of telehealth champions within their particular context of

everyday experiences. Participant reflections related to their experiences are important for garnering a holistic picture of how telehealth networks become successful and remain sustainable.

IPA is a methodological framework for examining major life experiences from the individuals' perspective (Smith et al., 2009, p. 1). The theory of IPA provides an understanding of how to examine and comprehend the initial memories and subsequent reflections constructed as part of a lived experience. As an approach for conducting research, IPA is a partial map that encourages researchers to construct studies that follow paths less traveled and are not constrained by prescribed methodologies (p.41).

According to research conducted by Smith (2011, p. 24) examining 293 IPA studies published between 1996 and 2008, good IPA studies result in papers that have several attributes, including: focused with detail of a particular group or technology; based on strong data derived from good interviewing; rigorous with appropriate sample sizes that are represented throughout the extracts and narratives; and presented in enough space and with elaboration in order to provide thematic depth along with breadth. Strong studies also must account for the participants and their themes through interpretative, not just descriptive analysis; have analysis that points to "both convergence and divergence" within the experiences of multiple participants; and should be carefully written to lead the reviewer through a well-developed narrative. The use of IPA to conduct this study followed research processes constructed to engage champions as partners in creating a dynamic, bold and interpretative narrative of their lived experiences.

Research Processes

A combination of inquiry methods was utilized including the outline for proposals in qualitative research by Munhall and Chenail (2008, chap. 4), procedural steps for phenomenological research outlined by Creswell (2007, p. 81) and the collection, analysis and writing-up of data from the IPA tradition as proposed by Smith et al. (2009, chap. 4–6). Taken together, these sources provided a framework for investigation while maintaining flexibility for methodological adjustments as the research progressed (see Appendix A).

Creswell (2007, p. 81) provided a collection of general procedures for conducting phenomenological research based on writings by leading phenomenological researchers. According to Creswell (2007), the general processes are:

1. Determining if a phenomenological approach is appropriate for the research problem.
2. Investigating a phenomenon that is of interest to the researcher and others in the field of study or discipline.
3. Applying the "broad philosophical assumptions of phenomenology" (p.81) while conducting the research without the previous experiences of the researcher (known as epoché or bracketing out the researcher's experiences).
4. Collecting data from an appropriate sample of individuals and utilizing multiple in-depth data sources.

5. Gathering data derived from open-ended questions that seek to determine the lived experience related to the phenomenon, and the contexts or situations that influenced those experiences.

Participant Selection

Regarding the sample that formed the basis of this study, Smith et al. (2009, p. 49) recommend concentrating on a purposefully chosen sample of participants who can "grant us access to a particular perspective on the phenomena under study." The researcher recruited participants from a sample of accessible champions within an existing telehealth network in the state of South Carolina. The study sample was comprised of key informants known as champions (located at spokes) who were identified by their peers (located at hubs) as essential collaborators.

Following the research proposal's approval by the Institutional Review Board (see Appendices F and G), the researcher recruited study participants, obtained informed consent and conducted semi-structured interviews. The researcher attempted to recruit a demographically diverse sampling of champions who were reflective of the networks they serve. In alignment with the recommendation from Smith et al. (2009) to include three to six participants in an IPA study, at least five homogenous participants from each of the three champion groups (clinical, educational and technical) were interviewed as part of this study.

An initial survey of 11 telehealth leaders based at multiple telehealth hubs across South Carolina produced 35 names of telehealth champions who were recommended for their passionate and successful provision of services. Telehealth leaders were defined as those having significant responsibility and experience leading telehealth initiatives and

coordinating services with communities away from major academic health centers. Leaders were contacted via email and phone by the researcher and asked to provide the names and contact information for only those partners who had made significant contributions to telehealth activities based on demonstrated successes (e.g. overcoming barriers, expanding to additional locations, initializing new services).

Nominated champions were then invited to take part in the study through a formal, written email invitation (see Appendix B). A total of 16 telehealth champions participated in semi-structured interviews from August-October, 2013. Participants were emailed the informed consent form for participating in the research study (see Appendix C) prior to their interview date. Almost all signed and returned the form via email before the start of the interviews. Three participants had questions about the study that were addressed at the beginning of the interviews (confidentiality/publication of results). All participants signed the informed consent form and received a final, signed copy for their records via a scanned email.

Semi-Structured Interviews

Prior to the beginning of the interview portion of the videoconference session, the researcher conducted the following steps: welcomed the participant; reviewed the study procedures; discussed the informed consent and answered all participant questions; and emphasized that the participant could discontinue participation at any time. Once the participant was comfortable with the proposed sequence and procedures, the researcher provided a chance for any additional questions and reviewed the transcript review procedure.

Interviews were conducted using a statewide videoconferencing network with telehealth champions meeting with the researcher in a designated video bridge recording room. Only three interviews had to be rescheduled due to: a loss of electricity at one facility and equipment issues at two other facilities that were not resolved prior to the scheduled interview times. Audio issues only affected one participant and resulted in changes to the local site's equipment that should improve their call quality for future communications. Edits were made to the transcript by the interviewee that addressed almost all of the audio lapses.

An approved interview schedule was used to guide the researcher and help frame the conversation (see Appendix D). Over the course of the first five interviews, the researcher added questions to the interview schedule that had informally developed during the first sets of interviews in order to make sure the data would be collected for all participants. Based on initial analysis of the first sets of transcript data, the researcher also paid special attention to questions later in the interview schedule that elicited personal impressions of telehealth champions' roles and feelings about their involvement in telehealth activities.

During the course of each interview, the researcher inquired about the lived experiences of each of the telehealth champions in order to address the primary research questions:

1. What do telehealth champions believe to be the human elements necessary to advance telehealth systems?
2. How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?

3. How do these champions use shared processes and experiences to help spur engagement?

Based on these research questions, non-linear, secondary questions were utilized within the in-depth interviews. Munhall and Chenail (2008) reported that this stage is often characterized as "a conversation with a purpose" (p. 57). As Smith et al. (2009, p. 47) advised, a variety of open-ended questions were included in these interviews to facilitate a dialogue with champions about their specific experiences, observations and interpretations. These questions formed the basis of a loosely defined *interview schedule* that served as a guide for the conversation (see Appendix D). Examples included:

1. Please describe your lived experiences as a telehealth champion.
2. How did you come to work with a telehealth application?
3. What were the barriers that you had to overcome to make your telehealth application successful?

Smith et al. (2009, p. 68) recommended injecting prompting questions to illicit additional conversation. They include: "Why?; How?; Can you tell me more about that?; Tell me what you are thinking?; and How did you feel?." The researcher integrated similar questions into the interview schedule to clarify and expound on a participant statement.

While each champion group is a part of the larger telehealth community, they represent divergent experiences within that community and, as such, were examined with their cohorts as well as across the larger telehealth community. Champions were asked to share their lived experiences as members of their professions and in reflection of their overall experiences as telehealth champions.

Transcription and Review of Data

At the conclusion of the interview process, the data were transcribed, organized and reviewed. Kvale and Brinkmann (2009, p. 192) describe the interviews not as transcripts but as living conversations. The authors also view the data as "co-authored" instead of "collected" and recommend reviewing the transcripts as holding both written meaning and the socially constructed meaning that was formed as part of the interaction between interviewer and interviewee.

In order to ensure the reliability and validity of the data, a third-party transcriber, serving in a contractual capacity, transcribed each interview prior to its import into a qualitative data analysis tool (e.g. NVivo, "NVivo 10 research software for analysis and insight," n.d.). Before the initiation of transcription services, the researcher and third-party transcriptionist entered into a standard non-disclosure agreement to protect the identity of participants and the confidentiality of the data. Interviewee files were de-identified prior to being transferred to the transcription service and any identifying information (i.e., names, organizations, locations) were de-identified from the transcripts by the researcher prior to inclusion in this report.

The third-party transcriptionist transcribed all audio recordings extracted from the videoconferencing recording device within 48 hours. The researcher then compared the interview transcript to the audio file for accuracy. Once reviewed, the transcribed interview for each participant was emailed for his or her review, edit, elaboration and approval (see Appendix E). Up to two prompts were made to solicit feedback from the interview participants. Twelve of the interview participants made changes or simply gave their approval of the transcript as provided. Several gave the researcher permission

to make grammatical changes as needed if text was going to be included in the final report.

Transcription and analysis of interviews were conducted utilizing basic word processing and spreadsheet software. NVivo software, which is specifically designed to help identify and code thematic phrases, was procured and used in the data analysis and reporting phases.

Data Coding, Organization and Analysis

Upon the complete review of the transcribed interview data, the researcher further engaged in the iterative process of coding and analyzing the data for themes. Smith et al. (2009, p. 79) characterize the process of coding and analysis as "moving from the particular to the shared, and from the descriptive to the interpretative." Strategies employed for this research included: a line-by-line analysis of the data for each participant; the identification of emerging patterns; the development of a structure for the illustration of relationships between themes and the creation of a *full narrative* which leads the reader through the identification and interpretation of themes.

Interview transcripts were organized, coded and analyzed using NVivo software ("NVivo 10 research software for analysis and insight," n.d.). NVivo provides researchers with the ability to code transcripts for themes unique to individuals and for themes that emerge from the connections found across individuals. Initial codes were established using NVivo after the interview transcripts were completed based on common phrases and shared elements. As transcripts were organized, read and re-read within NVivo, additional codes were created to incorporate emerging themes. A total of 35 codes (nodes) were developed based on this process (see Appendix H). Upon the

completion of coding and the organizing of data, the researcher analyzed and interpreted the themes that emerged based on the following recommended structure of IPA.

Smith et al. (2009, pp. 82-101) recommend these specific steps for coding and analysis:

1. *Reading and re-reading* – This is a process of immersion for the researcher. In this phase, the participant becomes the focus of the analysis. Also, structures for the analysis of data begin to emerge. In this phase, the researcher read the initial transcripts and the final transcripts after the individual participants approved them. The final transcripts were entered into NVivo during this stage.
2. *Initial noting* – In this stage, the researcher begins to make exploratory comments about the meaning of the data. These notes focus on the participant's relationships, the processes they describe, the environments they are facing and anything of interest. The authors note that this stage is detailed and time consuming. The researcher annotated the transcript within the NVivo software as a way of capturing her thoughts through exploratory comments. This review allowed for the examination of the data from the descriptive, linguistic and conceptual standpoints.
3. *Developing emergent themes* – Based on the notes detailed in the previous stage, the researcher now moves to exploring emerging themes based on the wealth of data collected and generated. This process yields insight into important comments and begins the process of interpreting some of the themes from a participant perspective but guided by the interpretation

of the researcher. During this stage of data organization and analysis, the researcher utilized NVivo software to construct nodes that were used to structure emergent themes. These nodes were structured around the following terms: barriers, championess, clinical care, education initiative, future, organization and process issues and technology.

4. *Searching for connections across emergent themes* – Smith et al. (2009) describe the process of looking for connections. This involves *charting, or mapping,* themes to see how they fit together. Methods include a number of techniques from counting to contextualizing to graphing data. During this stage, the researcher used a combination of NVivo software and hardcopy analysis of emergent themes to flesh out the thematic structure as it began to take shape. An example can be illustrated in the examination of nodes clustered by word similarity. Here, the researcher queried a list of emergent themes to find connections in words, phrases and ideas that emerged.
5. *Moving to the next case* – When moving to the next case, it is important to start the process over and look at the next participant's data from a uniquely individual standpoint. By allowing themes to emerge from individual cases, the integrity of IPA research can be maintained. The researcher bracketed her thoughts through the use of journaling prior to repeating the previous steps for subsequent interview transcripts.
6. *Looking for patterns across cases* – Through the process of examining themes across cases, there is the potential to see a shift in the connections.

Some cases can shed light on others, some can create a new level of categorization and some may even show larger connections for the group as a whole. During this stage, the researcher specifically utilized the functionality of NVivo to help expose patterns and reveal themes and super-ordinate themes. Examples include the relationship between the use of technology to meet patient care needs and support staff members as a positive aspect of telehealth (see Figure 3.1).

Figure 3.1. Example of Node Relationships

Reflexive Bracketing and Journaling

Considerable attention is played to the role of bracketing in phenomenological research. Bracketing is a term used to the describe the "attempt to place the common sense and scientific foreknowledge about the phenomena within parentheses in order to arrive at an unprejudiced description of the essence of the phenomena" (Kvale & Brinkmann, 2009, p. 27). The authors define an *interview craftsman* as someone who can "conduct an informed conversation" through a structured interview that utilizes clear, gentle, sensitive and open language (p.166). The craftsman can also help to steer the

conversation to make sure the appropriate knowledge is acquired while not taking everything at face value. Building on statements shared during the course of the interview, the craftsman can "clarify and extend the meaning of the interviewee's statements" (p. 167).

Although the researcher has had personal and professional experiences with telehealth activities, these experiences can be seen as beneficial or at least manageable when conducting an IPA study (Smith et al., 2009, p. 25). Given the complex nature of telehealth, the large baseline vocabulary needed when speaking with three distinct professional populations, and the credibility needed to facilitate a frank conversation, this researcher felt better prepared to be an active listener in this process because of her prior experiences. The status of being an insider in this arena was important to transcend possible barriers to the research study.

The researcher's orientations to and beliefs about the role of champions within evolving telehealth networks stem from experience as both a participant and an observer. As an educator within a statewide telehealth network that is based at an AHC, the researcher has first-hand knowledge of the challenges and opportunities afforded by telehealth networks. Given this prior experience, the researcher's role helped to facilitate the discussion about the complex decisions being made by clinicians, educators and technical staff at the hub and spoke locations.

While it was not possible for the researcher to be completely objective in the study of telehealth champions, she made every attempt to set aside her experiences and allow those of the study participants to tell the story. Although the researcher had experience in the area of telehealth, she was able to use the vocabulary of terms and concepts that she

acquired through her experience mainly as a basis for asking appropriate questions and understanding the general environment and processes being described. Beyond utilizing that vocabulary for communication and understanding, the researcher refrained from injecting her personal experiences into the research processes and actively engaged in bracketing.

Reporting

The final stage of IPA involves writing up the analysis or results. This stage includes a detailed description of the findings related to the research conducted on telehealth champions. The findings section is based largely on extracts from transcripts, narrative overview of the emerging themes, visual graphics that help move the reader through the logical structure, and interspersed analysis of the findings. Themes are presented in narrative form and are analyzed for the reader as both individual responses and as part of the whole study.

Due to the larger proposed sample size for this study (at least five of each group), the researcher followed the recommendations by Smith et al., 2009 in conducting a group-level analysis that results in "summarizing, condensing and illustrating what you consider the main themes to be" (p. 114). Short extracts of transcribed text are presented and cross-referenced with other extracts in order to support the interpretations being made within the discussion section. Participant quotes are presented with a pseudonym and a group code (i.e. C02, T01 or E04) to further distinguish the data and provide context based on the champions' role. An audit trail including the node classification chart (see Appendix H), a coded and annotated data sample (see Appendix J), and an example of a node count (see Appendix I) are published as part of this report.

Resources and Instrumentation

The researcher had adequate access to the resources needed to complete this study. Due to the nature of the researcher's work, she had access to clinical, educational and technical champions located across the state as well as to experts in each field who helped to identify champions for inclusions in the study. The pool of potential champions was sufficient to provide an appropriate research sample size.

Research was conducted with practitioners, educators and technical support personnel who connect to telehealth applications utilizing the Palmetto State Providers Network (PSPN). The PSPN was formed out of a collaboration with the state's healthcare delivery system and academic medical schools (known as Health Sciences South Carolina) and FRC, LLC, which is owned by the SCANA Corporation and PalmettoNet ("Palmetto State Providers Network Frequently Asked Questions," n.d.).

The PSPN was launched in 2009 and "provides broadband networking, Internet and Internet2 services throughout all 46 counties of South Carolina with an emphasis on the rural areas of the state" (Poston, III, n.d.). The PSPN is utilized to advance the delivery of healthcare, research, and education by providing a secure, dedicated high-bandwidth Healthcare IT network that uses a carrier Ethernet circuit to transport vital health information ("About Palmetto State Providers Network," n.d.).

All of this is possible because of the PSPN's architecture. The PSPN supports both layer 2 and layer 3 network services. Each member location is connected to a 10 Mb Ethernet WAN connection on the PSPN ("About Palmetto State Providers Network," n.d.). Individual connections feature a minimum of 5 Mb of commodity Internet, access to Internet2, use of a multi-gigabit optical fiber backbone network, free VLAN

connections to other participants, centralized audio/video bridging for conferences, access to the Nationwide Health Information Network (NHIN) for electronic health records and an Ethernet switch at the terminating location ("About Palmetto State Providers Network," n.d.).

Because the PSPN is first and foremost a Health IT network, network and data security is essential. "PSPN traffic is isolated over the network by the use of tags, much in the same way ATMs are" ("Palmetto State Providers Network - IT Frequently Asked Questions," n.d.). Traffic is made secure through encryption by using protocols such as IPSec or SSL. Stringent guidelines and protocols are in place to ensure compliance at all levels of the network with the federal *Health Insurance Portability and Accountability Act* (HIPPA) of 1996 even though no patient information was discussed as part of this study.

Multiple e-learning and e-health applications have been deployed utilizing the PSPN. Telehealth applications provide specialty care in the areas of mental health trauma, stroke, OB/GYN, radiology, dermatology, oncology, surgery and pathology. Research is facilitated though the Hollings Cancer Center Clinical Trial Network (based at the Medical University of South Carolina), and smaller grant specific initiatives. E-learning applications are provided through the South Carolina Area Health Education Consortium (South Carolina AHEC) system of videoconferencing and online education to support the advancement of quality patient care across the state.

The South Carolina AHEC system of videoconferencing equipment is known as the South Carolina Health Occupations Outreach Learning System, or SCHOOLS ("South Carolina Area Health Education Consortium - SCHOOLS," 2012). This system provided

the ability to record all aspects of a high-definition videoconferencing session including the audio, video and content (slide presentations and movies) through codec (Polycom) or desktop (Jabber) applications. Recordings were transferable to universal file formats (.mp4 and .wmv) so they could be reviewed and shared by multiple parties. The audio files were downloaded separately from the video files that contained a combined video and audio recording. Recordings could only be accessed on the device through a password-encrypted login that was established by the researcher. As part of this study, recorded interviews were helpful in interpreting interpersonal communication signals as part of the analysis.

The researcher employed best practices in the area of human computer interaction (e.g., camera placement, audio levels, lighting) to ensure the highest level of quality in the facilitation of interviews. Also important, but unexpected, was the researcher's ability to use more non-verbal communication to indicate understanding while on the video call. This resulted in fewer interruptions by the interviewer, transcripts that flowed more completely and good interpersonal communication between both parties.

Ethical Considerations and Compliance

The researcher developed informed consent materials and applied for Institutional Review Board (IRB) approval through both the host academic institution (Nova Southeastern University) and through the study site institution (Medical University of South Carolina). Since participants shared personal accounts of their experiences as telehealth champions, each of the participants was assured confidentiality. All interview data was de-identified and pseudonyms were used in place of participant names. Interview data was entered, stored and backed up on private and secured network

resources available to the researcher through her role with the Medical University of South Carolina and in compliance with all IRB regulations. Data will only be kept as long as required by IRB protocols at both institutions. All recordings are to be kept for 36 months from the end of the study and the recordings destroyed after that time by erasing the electronic files.

As recommended by Smith et al. 2009 (p. 183), the researcher has strengthened the validity of the research by demonstrating a clear audit trail from the initial proposal to final report (see Appendixes H-J). This trail allows for other researchers to speak to "the truth" of the findings (p. 183) and serves as a blueprint for others interested in conducting similar research.

Chapter Summary

In this chapter, a detailed plan for the implementation of this IPA study was outlined. The researcher details: the identification champions who participated in semi-structured interviews; the data transcription and review procedures; the coding and annotation of data for emerging themes; the analysis of themes within and across disciplines; and the development of a final report.

Throughout every stage in the process, the researcher was cognizant of biases and personal experiences that might affect the study. The researcher engaged in a system of reflexive journaling in order to bracket any potential bias while conducting the study with the highest levels of ethical intent and participant consideration.

The results of this interpretative phenomenological analysis, as framed by Smith et al. (2009), are presented in the next chapter. Charts, figures and thematic descriptions accompany narrative presentations of the findings.

Chapter 4

Results

Introduction

The purpose of this interpretative phenomenological analysis (IPA) was to explore the lived experiences of telehealth champions. By examining their experiences, the researcher anticipated achieving a better understanding how champions helped to advance telehealth networks. Through a better understanding of how existing networks have been developed and supported, this researcher anticipates that future telehealth activities can benefit from the purposeful utilization of telehealth champions, or "human tele-ments", as described by Meyer et al. (2012).

There were three main research questions used to guide this study and understand telehealth champion experiences:

1. What do telehealth champions believe to be the human elements necessary to advance telehealth systems?
2. How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?
3. How do these champions use shared processes and experiences to help spur engagement?

Chapter 4 presents the lived experiences of telehealth champions through their own words. A narrative review is presented in order of the general flow of the participant responses from general/organizational to specific/personal. Specifically, this chapter provides a thorough analysis of the data collection methods, thematic review and coding and summary of findings.

Data Analysis

This data analysis was based on a methodological framework as outlined by Smith et al. (2009). The IPA included: reading and re-reading; initial noting; developing emergent themes; searching for connections across emergent themes; moving to the next case; and looking for patterns across cases. This iterative process involved developing codes based on the interview data, coding the data by nodes (single/multiple), annotating the data as well as the coding, visualizing the data, and organizing the data nodes by overarching themes. The continuous refinement of themes and concepts culminates in an exploratory narrative detailing the experiences of telehealth champions.

Demographic Data

The participants interviewed for this study are representative of the main roles of telehealth champions: clinicians, educators and technologists. Telehealth leaders at hub academic medical centers nominated individuals whom they considered to be telehealth champions based on their success in starting and maintaining telehealth networks. A total of 35 telehealth champions were identified from across the state and 16 were interviewed for this study. Three potential participants were not reachable due to incorrect contact information or changes in employment status. An additional three potential participants declined to participate due to work obligations or deferred to others whom they deemed to be more representative of a "telehealth champion" (see Table 4.1).

Table 4.1. Participant Recruitment

	Number of Invitations Sent	Invitations Returned	Invitations Declined	Invitations Accepted	Interviews Conducted
Clinical	17	2	1	7	6
Educational	7	1	1	5	5
Technological	11	0	1	6	5

As evidenced by the participant demographic breakdown (see Table 4.2) and the demographic counts (see Table 4.3), the researcher was able to use targeted recruitment to: 1) achieve an equitable representation of champion practice settings, roles and genders across the state; and 2) a representative sample of the age range of champions involved in telehealth activities. Although this study was originally conceived to examine the lived experiences of telehealth champions from more remote and resource constrained areas (suburban and rural spokes), several urban participants (n=5) were included because of their abundance of experiences as champions in hub or emerging hub locations.

Table 4.2. Demographics Data Content

Person	Age Group	Practice Setting	Role	Gender
Ethan C01	30-40	Rural	Clinical	Male
Tonya C02	41-50	Urban	Clinical	Female
Beth C03	61-70	Urban	Clinical	Female
Ann C04	41-50	Rural	Clinical	Female
Clara C05	41-50	Suburban	Clinical	Female
George C06	71-80	Urban	Clinical	Male
Loretta E01	41-50	Suburban	Educational	Female
Margaret E02	51-60	Suburban	Educational	Female
John E03	71-80	Urban	Educational	Male
Kim E04	30-40	Rural	Educational	Female
Sarah E05	51-60	Rural	Educational	Female
Robert T01	30-40	Suburban	Technical	Male
Henry T02	51-60	Rural	Technical	Male
William T03	30-40	Suburban	Technical	Male
Davis T04	41-50	Rural	Technical	Male
Nathan T05	41-50	Urban	Technical	Male

Because telehealth champions are not *born* as much as *grown*, most champions were in their upper 30's or above in terms of age. The clinical participants averaged an older age mainly because, in addition to being trained as healthcare professionals (nurses, counselors, administrators), their involvement in telehealth was part of evolving

responsibilities or was a distinctly second-phase of their careers. Educators also were more likely to cite their telehealth involvement as an additional or emerging role that stemmed from their work in clinical settings. The all male cohort of technologists averaged a younger age than the other two champion roles, but they had garnered extensive experience within healthcare environments prior to and as part of their involvement with telehealth.

Table 4.3. Demographic Counts

Telehealth Champions (n=16)	
Urban	5
Suburban	5
Rural	6
30-40	4
41-50	6
51-60	3
61-70	1
71-80	2
Male	8
Female	8
Clinical	6
Education	5
Technology	5

Clinical Participants

The clinical telehealth champions included healthcare providers who were also tasked with administration and coordination functions related to telehealth networks. These champions were majority female (females = 4 and males = 2) with an even distribution of age (30-40 = 1; 41-50 = 3; 61-70 = 1; and 71-80 = 1) and practice settings (rural = 2; suburban = 1; and urban = 3). Not all clinical telehealth champions are still engaged in direct patient care, but they all had responsibility for making sure clinical processes related to telehealth were successful. In addition to clinical responsibilities, almost all participants had at least informal education responsibilities related to the deployment of telehealth applications.

Educational Participants

The education telehealth champions also had extensive clinical backgrounds. In their previous roles, they were nurses and basic science educators. All, but one of the

educational champions, were female (females = 4 and males = 1) and their ages were across the full range (30-40 = 1; 41-50 = 1; 51-60 = 2; and 71-80 = 1). They were distributed in the more rural and suburban areas (rural = 2; suburban = 2; and urban = 1). Several educators were at least partially responsible for supporting telehealth activities through education about clinical equipment and processes. Almost all were responsible for both educating the next generation of providers using technology, as well as, on the use of telehealth technology in a clinical context for patient care. One recent retiree was included because of his decades of work building the infrastructure for education that is now utilized across the state and his nomination by multiple telehealth leaders as a *must* interview participant.

Technological Participants

As previously stated, the technology champion cohort was the youngest (30-40 = 2; 41-50 = 2; and 51-60 = 1) and was comprised only of males. The researcher specifically requested that telehealth leaders who helped to identify champions across the state provide female nominations, if appropriate. Unfortunately, none was received. The technologists' mirrored the educationalists' practice setting distribution (rural = 2; suburban = 2; and urban = 1). Their backgrounds with clinical technology enabled them to assist with the development of new telehealth networks and serve as advisors to administrators trying to navigate a sea of new technologies. Technology champions had given a great deal of thought to questions about where the telehealth applications were headed as evidenced by findings detailed in this chapter.

Interviews

Semi-structured interviews were conducted with 16 participants using videoconferencing technology that facilitated two-way audio and video communication. Interviews spanned a length of time from 26-86 minutes (see Table 4.4). Analyses of the interview lengths indicated shorter interview times for educational champions – possibly due to the narrower scope of education programs offered through and in support of telehealth networks. Although clinician times varied, the average was higher due to the overview of a larger scope of clinical activities that often included discussions about education, technology, policy and personal philosophy.

Table 4.4. Average Length of Interview in Minutes by Cohort

	Clinical	Educational	Technological
	86	32	36
	32	26	39
	55	27	39
	32	33	48
	65	70	45
	64		
Average in Minutes	**55.7**	**37.6**	**41.4**

Transcription

A third-party transcriptionist transcribed all interviews, which were then compared to the original audio files for accuracy and clarity by the researcher. Transcripts were emailed to each participant within 48 hours of the interview, and they were asked to review the transcript for accuracy, clarity and completeness (see Appendix E). Of the 16 participants, 15 indicated a willingness to review their transcripts as part of the informed consent process. Of the original 15, 11 participants reviewed their transcripts, responded to the researcher and indicated satisfaction with the document or suggested changes. The

majority of edits provided clarity of thought for the individual's account of events or experiences. Edits also helped to catch transcription errors - mainly names and an acronyms. Three participants provided extensive edits in response to what they perceived to be personal speaking shortcomings. Many participants expressed shock or concern about their speaking style since this was the first occasion they had to review their captured verbal responses. The researcher tried to allay any concerns by reiterating that the most important component of each transcript was the participant's reflections and perspectives. Participant quotes are presented in this report in their entirety where possible. All accurately reflect the original intent expressed by each participant. From a curiosity and interest standpoint, several participants expressed an interest in reviewing the final report to see if there are lessons they can gleam from other champions.

Data Coding

After participants had a chance to review their transcripts and provide edits, the researcher loaded the transcript data into NVivo ("NVivo 10 research software for analysis and insight," n.d.) for analysis. Participant demographic data were also added into NVivo for use in the comparison of data nodes and the development of the demographic data set.

Transcripts were read, and re-read numerous times as they were finalized. Concepts began to emerge that allowed the researcher to begin to formulate a coding structure. All transcripts were coded and annotated multiple times (see Appendix J). As additional transcripts were added, codes were expanded, reorganized and consolidated. The resulting 35 nodes served as the structure for coding participant data and researcher

annotations (see Appendix H). The researcher made refinements to the interview schedule and coding process based on the initial review of transcripts.

The process of data coding and analysis was truly iterative. As the researcher worked through the development of themes and the presentation of findings, additional questions and concepts were explored. Even after completing the analysis and drafting the findings, the researcher reviewed the coded data again to confirm conclusions. The continual *pulling of strings* to unravel meaning within a larger context resulted in a deeper understanding of the data and the method of IPA.

Journaling and Bracketing

As part of this IPA research process (see Appendix A), the researcher created a journal to help bracket her thoughts and experiences related to telehealth based on the process defined by Ahern (1999). This process resulted in excess of 20 journal entries totaling over 4,200 words documenting experiences and revelations throughout every phase of the research. A textual analysis of these entries showed an evolution of the researcher from being knowledgeable about telehealth systems to intimately appreciating the experiences lived by the people who made telehealth systems successful. An initial journal entry by the researcher read:

> "I am interested in looking at the role of telehealth champions because I believe they are the 'X' factor. In their roles as clinicians, educators and technologists, they are the essential elements to transform processes and environments to support greater access for patients."

A later journal entry by the researcher reflected a much more personal account of the process:

> "As I finalize the last interviews for this project, I am struck by how I want to know more. I honestly did not think that people would be as open

> or forthcoming about their experiences. It is refreshing to talk to people across the state who just want to see things improve and who are capable of making that change a reality."

The passion demonstrated by the telehealth champions in the course of their daily work served as an inspiration for the researcher to understand how telehealth applications came to be successful and what success might look like in the future. The researcher continued journaling through the completion of the reporting process as a way of staying in touch with the experiences of the participants and the data that formed this report.

Review of Data Collection Method

In the course of developing this research study, the researcher conducted a detailed analysis of the existing recommendations for conducting qualitative research using videoconferencing communication as the data collection method. Findings from Glassmeyer and Dibbs (2012) and Sedgwick et al. (2009) were encouraging and outlined best practices for conducting research at a distance. The researcher implemented these best practices in human computer interaction and interpersonal communication.

Not only did the use of videoconferencing enable the researcher to quickly gather data, include participants from all areas of the state and obtain audio and video data through recorded interviews, the method resulted in new technical connections and potential collaborative partnerships. When technical issues needed to be addressed, they resulted in long-term fixes that have the potential to benefit others in the future. Videoconferencing was a medium familiar to all participants and was a fitting choice for collecting data about the use of computer-mediated communication. Participants expressed eagerness to "keep the conversation going" after the completion of the study.

The use of videoconferencing also reduced the amount of verbal feedback required of the researcher. After the researcher completed the first interview and reviewed the transcript, the researcher was cognizant of the opportunity to fill the silence during subsequent interviews with clear, nonverbal communication. This resulted in transcripts that clearly encompassed the participants' trains of thought so they were able to be coded and analyzed in larger, more complete sections.

Findings

This chapter uses IPA to present thematic findings obtained from 16 in-depth interviews with telehealth champions. Seven major findings emerged from this study:

1. *Modern Pioneers* – The majority of telehealth champions are self-described modern pioneers who are also *just doing their jobs*.
2. *Champion Teams* – Telehealth champions view their roles and successes mainly in the context of larger teams that are working towards common goals.
3. *Agents of Change* – All 16 telehealth champions embrace the use of "emergent disruptive technologies" to change inert systems and create new processes that improve access and patient care.
4. *Knowledge Brokers* – Telehealth champions are both acquirers of knowledge and the givers of invaluable experiences that serve to inform others.
5. *Supported by Management* – The majority of telehealth champions see the support of management as essential to their professional development and the development of new telehealth activities.

6. *Advocates, More Than Champions* – The term "champions*"* is not a comfortable title for most of the study participants as most view themselves more as advocates or simply members of a team.
7. *Well-Prepared Visionaries* – Telehealth champions are constantly focused on improving their current processes in order to be prepared to take future steps in implementing what they see as an inevitable progression of technological capabilities.

In preparation for the research findings offered below, the researcher would like to provide one introductory quote from a participant that highlights the importance of telehealth champions being fully supported as they seek to adopt, improve and diffuse telehealth applications. From Beth C03 came this overview of why telehealth is important:

> "Telehealth applications make a difference in a patient's outcome. This technology facilitates more timely access to care, which, in some cases, may save a life or decrease disability. Providing this access to care may also reduce the stress for the patient and family if they don't have to leave their home environment, neighborhood or community to get care. Timely care may produce a better outcome, without death, disability, or complications."

Using many different words, the majority of telehealth champions stated these exact sentiments.

Data Visualization

The researcher utilized several visualizations to help explore the words most frequently used by participants and to view source data by areas of coding similarities. A word frequency count documented over 1000 instances of the term "thinking" that included similar words such as: think and thinks (see Figure 4.1). This could be seen as

significant in a study about the experiences of telehealth champions because participants appear to be process driven individuals who deliberate and carefully select their word choices. Specially, the term "I think" was a leading descriptor for how participants framed their answers to questions. Champions had given telehealth a great deal of thought and were used to speaking professionally about the technologies capabilities and challenges.

Figure 4.1. Word Cloud Based on NVivo Analysis of Coded Nodes

Other words that were heavily weighted in the frequency count included (in order of frequency): things, patient, works, seeing, people, needs, hospital, technology, educator and physician. Again, the word "patient" was central to the reasons participants gave for their passion in the area of telehealth and the outcomes they cited as being important.

Super-Ordinate Themes

Two parallel forces helped to order the super-ordinate theme findings presented in this section: the order of the interview schedule and the movement of participant

responses from being representative of the general/organizational perspective to the detailed/personal perspective. Corresponding sub-ordinate themes are presented as pullout figures within each section. The following narrative captures the journey of both the sample of 16 champion participants and the researcher towards understanding.

Modern Pioneers

The majority of telehealth champions are self-described modern pioneers who are also *just doing their jobs* (see Figure 4.2). This dichotomy seems counterintuitive, but results from the manner in which champions' roles evolved in the area of telehealth. Sometimes they were unwitting participants in a change process, but other times they actively chose their roles. Regardless of how they came to be involved in telehealth, their current roles place them outside the standard scope of healthcare activities related to clinical, technical and educational services. George C06 provided a conceptualization of pioneering in the context of telehealth:

> "The pioneers bought the covered wagons, got the provisions and, they set out for California. Well, the settlers kept saying: 'Tell me when it's safe.' They enjoyed being at home, and the poor pioneers were out there freezing, hungry and those kinds of things.
>
> You have to have a certain degree of personal comfort with a risk factor to take on a project like this. And I think all champions at some point in their course sense the alone-ness. They're not necessarily lone-ly, but there is an alone-ness that goes with this that they have to overcome. It's simply that they're out in front of the column to some distance. With time and buy-in the others will catch up to them."

Pioneers can also be defined as innovators. Their roles are to manage change in a controlled, but progressive manner. As Marchesoni et al. (2012) found, change processes require empowered individuals who can help organizations evolve. Davis T04's perspective was common but uniquely framed:

> "That's the idea always is to be innovative, to be forward-thinkers, and to not be afraid of change. 'XYZ' is one place that I have to tell you is not afraid of change. They're wary of anything that might jeopardize the care of the patient, but they embrace change. Any time we can do anything that's better for the patient they are always supportive of what I bring to the table.
>
> We really do pride ourselves - and I hope I don't offend anybody by saying this - but we like to pride ourselves and say 'we're high-tech rednecks down here'. And that's kind of the term that stuck with us, because to walk into the server room and to see the technology there and the lights blinking and everything in its rightful place – it's very organized – it's pretty impressive, first of all, for my peers to go in and see it and they go: 'Wow, that's pretty impressive,' but the technology side of it alone… we really enjoy the fact that we aren't afraid to change, we aren't afraid to say, 'We'll be the beta test,' we aren't afraid to say, 'If it's in the best interests of the patient we'll give it a try.' And that gives us a lot of pride."

As might be expected in an application that delivers healthcare and education, participants universally possessed a background in clinical services or processes. Even the technology champions reported extensive experiences within healthcare environments and in support of clinical services. Loretta E01 provided her background, stating:

> "I've been nursing for about 25, 26 years...I have worked 7 years in information systems; I have worked as a nursing supervisor; I currently still work 'XYZ' as a rehab nurse and also as a site nurse; and now I'm finally working in an educational position, but my role has always been in education of some form. I just like the idea of knowing that we've done something that's going to advance the knowledge of the nurses so they're better prepared…"

Telehealth responsibilities were seen as an additional component of champions' existing job responsibilities. While some helped to initiate telehealth activities within their organizations, many were tasked with implementing services in support of external or internal initiatives. Tonya C02 stated:

> "I can sort of give you the context of my exposure. In fall of 2009, I was told that we were going to go with a certain vendor and we were going to implement telestroke services in "x" ERs…I was told as the clinical person, I would be responsible for figuring out how to make that work."

Sarah E05 captured the essence of telehealth as a personal endeavor that stemmed from her current role as an educator:

> "Oh, it's just another part of my job. I mean, it was fun because I've learned a lot. I'm a little old school, so anytime I get a chance to learn something new about computers or computerizations or this thing it's a good thing for me, because, like I said, I kind up of grew up in the pen and pencil days, so I'm making lots of adjustments and learning lots of things as a personal endeavor."

While opportunities presented themselves for educators who were looking for new ways to support their clinical staffs, the process of finding a good fit for the equipment and educational setting could be challenging as demonstrated by Margaret E02's experience:

> "Most of my experience has been with the Polycom system, and I kind of fell into it by accident. We were notified that the Polycom was at one of our [rural] facilities…that it was originally set up there as part of a grant. The grant was over, and it had not been used at all out there. The thought process was that is gaining access to education to the nurses in a rural area so they wouldn't have to travel, but they didn't use it. So, instead of it sitting there and being wasted, we decided to move it, and I kind of adopted the machine, in the process – or it adopted me. We tried it first at 'XYZ', thinking that was a growing area. We had difficulties with it there, because they were using the room for everything else. It didn't get utilized at all and was being used more for meetings and stuff, so we decided to put it out here at 'XYZ' so we could manage it for education."

Figure 4.2. Sub-Ordinate Themes: *Modern Pioneers*

Comfort with risk – e.g. 'personal comfort with a risk factor' (George C06)

Innovators – e.g. 'not be afraid of change' (Davis T04)

Involvement – e.g. 'just another part of my job' (Sarah E05)

Regardless of the length of their involvement with the organization, each had a choice to make about how to proceed professionally. When asked about their involvement in telehealth activities, Robert T01 shared: "I do find it interesting, so I didn't shy away from it, but the gentleman whose position I filled had left the company, and that was one of his primary responsibilities." Robert T01 picked up where a predecessor had left off, but this was an unusual case for most participants since they were the first to serve in a telehealth capacity for their department or organization.

The initial involvement of technical participants was focused on exploring the feasibility of the technology and related processes specific to their organizations. Vuononvirta et al. (2011) cited the compatibility of new technologies with established systems as one of the most important factors in adoption. Henry T02 recalled:

> "Basically when it came down to us it was like 'hey, we've got this idea. We want to see if we can't roll it out.' And I think at that time there was already some contact from 'XYZ' back to our hospital about setting up a program, but the question that I had was: 'Was it doable'? And my answer was 'yes, it's doable'. So, somebody has to say that for anything to work: 'It's doable'."

The process for exploring or supporting new applications was not always a smooth one as experienced by Nathan T05:

> "[Our company] signed the agreement first and worked on the technology second. At least that's what I've understood…it seemed to be true, because we encountered significant problems in my first six months on the job and it took quite a bit of research and basically peeling back the layers of the network to try to figure out what was even going on. But transmissions were horrendous; the physicians were upset; nobody really knew what was

> going on….Now, you can understand too, we have basically three fulltime employees in my department and we service 600 staff…To say that we're a thin department is an understatement. So, there is a lot of territory to cover and telehealth is just one small part of that."

Incentives were described by Zanaboni and Wootton (2012) as being key to the adoption of telehealth applications by healthcare professionals. Other than the occasional continuing education credit or pat on the back, no champion reported receiving any financial or professional incentives for his or her involvement in telehealth activities. Ethan C01's comments summed it up for the majority: "It's just part of my job description…I don't really even know if it's technically spelled out in my job description."

Telehealth champions are on the leading edge of the development of technology and processes across the new healthcare information frontier – mostly by their own choosing.

Champion Teams

Telehealth champions view their roles and successes mainly as part of a larger team that is working towards the common goal of improving patient care (see Figure 4.3). This theme is not well represented in the current literature related to telehealth. While Cho et al. (2009) detailed the importance of immersion in technology for clinical champions, details were not presented in their narrative about the use of team-based practice to overcome diffusion barriers.

Participants mainly reported their experiences from the perspective of their individual contributions within a team setting. In all cases, teams were multi-disciplinary and included colleagues with clinical, educational and technical expertise. Participants consistently pointed to their support and evolution as a champion within the team setting as an important way to overcome barriers and ensure success. Davis T04 reported:

> "I'd like to think that my involvement in telehealth as a champion has been fruit on the vine just because of the nature of the beast. So, by that I mean if I've been put in a position to be challenged and I've been put in a position to challenge others, well then by the very nature of putting the roots in the ground and putting the dirt on top of the roots and throwing a little fertilizer on top, then you just allow it to grow. And the champion part is only because I had the desire to put the tree in the ground. So, I like to think that it's not something that I go after individually; that it's part of a system, a team of people that all have the same common goal. I was just somebody to crack the whip and say: 'Let's get this done.' And I really enjoyed being that guy."

Given the changing nature of healthcare and the pressures being felt to adjust to the rapidly changing technology, the team concept is especially important. Beth C03 explained:

> "My biggest challenge is to ensure that we develop a telemedicine program that is a joint effort focused on improving patient care; it's a team effort and everybody has a role that's important. I would imagine that this is a universal challenge for other telemedicine programs---keeping the people who are doing the work engaged, feeling positive about the program and feeling valued for their work."

The team concept also hints at larger initiatives that can result in systemic changes. George C06 provided a great visual:

> "Having energy – being energetic; having good people skills. And part of that, of course, is knowing how to be a good team player. You can never do this alone. If you are attracted to what I call social system engineering… I love to fix things...I build bridges between agencies and people."

Without, in essence, a "champion team", it can be hard to even get the application off the ground. Coupled with a strong leadership vision, team-based development appears to be a powerful tool for advancing telehealth technologies. Henry T02 explained:

> "Well, with anything you've got to have somebody that says, 'Hey, we should do this.' So, you have to have more or less a leader that comes in

> and says, 'Hey, we've got this idea. Let's make it grow.' And then you have to have people willing to work together to bring that idea to fulfillment. And then you have to get beyond yourself and say, 'What's the ultimate goal or the ultimate thing that's driving this?' And it becomes not you; it becomes about how can I help the other person at some point. In other words, how do I become a giver instead of a taker? So, I would say that you'll probably find that most people that are involved with telehealth regardless of whether they're IT or in other capacities, they're the type of people that are givers."

Figure 4.3. Sub-Ordinate Themes: *Champion Teams*

No 'I' in Team – e.g. 'it's a team effort' (Beth C03)

New Partnerships – e.g. 'social system engineering' (George C06)

Growth – e.g. 'has really helped me grow' (Tonya C02)

The whole team concept is necessary for telehealth applications or they are not able to be adopted or achieve sustainability. Financial relationships, such as provider reimbursements for time spent doing telehealth consults, can be problematic without the right structures in place. In some circumstances, having one kind of champion is not a complete solution and champion clinical leaders are needed to help overcome the established healthcare structures (Joseph et al., 2011). Evidence of this was also seen in the interview with John E03:

> "So, it really does help to have the right people on your team. I think our error was – and I tried – but we could never get a MD to really get involved with our team, and it's because… I don't think they disliked us, but at least here…the physicians have to see patients in order to earn their salary."

Team-based services are also critical to the provision of appropriate and high-quality clinical telehealth care. Nathan T05 provided an example:

> "We've got children that need constant supervision…in the session rooms. So, it's a very meticulous process. Fortunately, our executive team at that facility, they've been renowned for their abilities to not only uphold the rules and regulations, but also the policies and procedures that are required

to make those sessions successful."

Equally essential is a highly coordinated support team that makes telehealth applications, like distance education for providers, work. Loretta E01 recognized her needs: "But I know if an issue comes up I know exactly where to go. I have an idea of how to do a lot of the troubleshooting. But it's good to have that IT support. If you have a good IT team it works. If you don't you're in trouble."

The entire identity of a champion can be hard to separate from the work they do as part of a team. When asked about being identified as a telehealth champion, Robert T01 replied:

> "Probably overstated! I mean, I think that I'm confident in my technical abilities and I enjoy working with the team, but, you know, I don't think I play any more an important role than they do. So, I think the word 'champion' probably… You know, I don't have any more influence or role play than they do. So, it's definitely a team approach."

Still, working as part of a champion team brings immense satisfaction to the organization and contributes to personal development for participants as described by Tonya C02:

> "Well, I'm very proud that 'XYZ' is recognized as a strong telehealth provider because I think we've worked very hard for that and a lot of people have put in a lot of effort for that. So, I am proud of our team here for doing that, for being recognized… I'm very proud that I could work with our teams to do that. It's a really challenging but rewarding thing and it has really helped me grow as a clinical nurse specialist and I appreciated the opportunity to be able to do that. So, I'm very proud of it."

Eventually, Tonya C02 was able to pull herself out of the team language to speak of her personal contributions. Even then, it was as part of the team. She concluded:

> "I also am proud that we were… I'm very proud that I could work with our teams to do that. It's a really challenging but rewarding thing and it

> has really helped me grow as a clinical nurse specialist and I appreciated the opportunity to be able to do that. So, I'm very proud of it."

Agents of Change

Telehealth applications are largely seen as disruptive to the existing systems of healthcare. Disruptive technologies – or *disruptive innovations* as termed by Moore (2004) and Christensen (2013) – fundamentally challenge the status quo. Given the largely rural nature of South Carolina, local cultural norms played a significant role in the adoption of telehealth activities. Telehealth champions serve as agents of change within their organizations and professions (see Figure 4.4). George C06 captured the sentiment best:

> "We do things a little differently here and we need to both trust and count on what folks are telling us. There was some convincing to do, but after the first four or five hospitals, it began to catch on. I've had to do much less of that now. It was a significant sea change in the beginning…like all innovation is. And we were functioning like 'disruptive technology', because we were intervening in a system, which had been longstanding. We were trying to move in another direction maybe as good as what had been going on for 20, 30, 40 years, but even be better than that. That's the destructive element. It did away with the familiar and created the new."

The road to telehealth adoption has been challenging and seems to be restricted by longstanding issues. The challenges participants identified are not unique and many of the barriers still exist for telehealth networks and providers. The following account provided by John E03 shows a history of legislative, regulatory and policy hurdles reaching back over 20 years:

> "So, in the beginning there were people who thought, 'Oh, this sounds neat and keen, you know. Let's give it a try.'...We got some federal grants and so forth to actually buy real equipment and there was a true connectivity between the different counties, etc. So, it looked like we could really go. Well, the answer was wrong, because I lost all of my

> health champions. And the reason was as soon as they learned HCFA, which was the name of a federal funding agency at the time…CMS now I would guess it is – panicked when they realized how many people can now be covered for healthcare via telemedicine…So, they [HCFA] declared that they would not pay for medical services unless you could touch the patient. And when our physicians realized that they couldn't get paid, as soon as they saw me walk down the hall they would run and would not have anything to do with it. And so, that was a big problem.
>
> And then I had one of the more remarkable experiences of my life, and that was that I had a special…requested meeting for me to go to the Board of Medical Examiners in the state of South Carolina to explain why I shouldn't be thrown in jail; that I was doing some illegal activity with this. And what it was all really about was they wanted to see whether or not I was using this technology to go to physicians in other states, because I think really these boards are really looking at protecting those within their state boundaries. So, they put the real crunch on this whole thing by indicating that they would not support and would give me a rough time…So, for a long time they looked at the technology askance. Well, that meant that my health champions…simply couldn't cooperate…
>
> I was about to retire in 2010; there was a statewide group of people from [academic institutions]… We were all over the state and we worked with the legislator who was taking the legislation that was successful in California and trying to get it passed through the state legislature and signed by the Governor. It would have taken away the liability that so many physicians worried about if they used the technology. And it was just being introduced in the legislature when that particular legislator ran afoul of the law over something totally unrelated to this and it just crashed. And I truly cried that day, because I thought that was going to hold back the implementation of the technology just because, you know, everyone agreed what needed to be done is to have the state say, 'It's okay for you all to use this,' and then the Board of Examiners, etc., would have to go along with it, the insurance companies would start paying for it and this thing would finally get out of the ground if you will."

The initial forays for most institutions appeared to have been initiated from outside entities including larger regional hospitals, or technology/connectivity providers.

Technology was identified early on as a way to address geographic boundary issues. David T04 explained:

> "…then four years ago it really started to take feet when the whole PSPN process came out, because then they said: 'Let's offer you a secure way to connect through video bridges and protect the patient's health information, and then implement telemedicine at these rural sites,' – which is perfect for what we do, because we have a very difficult time recruiting providers who want to work in a rural health setting."

Proving innovative models of care for older populations with chronic diseases is an area of important change being facilitated by telehealth applications (Dexter et al., 2010). Clara C05 detailed the way that technology provides an entirely new way for her organization to provide care:

> "So, early 2000s, you know, telemonitoring was starting to be something that was available, and then going to those national meetings and actually seeing what some of the pioneers were doing, and our actual computer vendor developed their own model of telemonitoring too, so it seemed like the right kind of adjunct to our services…So, I think looking at it from the aspects of years ago and today there were many times when I left a patient at home that I thought was unstable or I just wasn't comfortable with them, but I had no other way to actually check on the status of that patient unless I physically went back to their home. And now we have that technology. So, we can tell a patient when they leave their home maybe: 'We want you to do an extra transmission tonight so that we can see what's going on with you.' We always tell patients that even though we set them up on specific times to transmit you can transmit to us any time you feel like your condition is changing. And that's very beneficial because we let them know somebody's always going to be able to see that."

Internally, participants experienced significant challenges to coordinating the processes that make the clinical provision of services via technology feasible. Champions cited multiple instances where the entire healthcare system was affected as Beth C03 indicated:

> "Because telemedicine relies on many departments, including IT, clinical, billing, etc., it is important to collaborate with many internal partners. Their input, advice and the suggestions provide support and structure for the program."

To a lesser extent, there were issues related to securing the technical connections and learning how to utilize the equipment. William T03 provided a good overview of where the opportunities exist:

> "I mean, obviously network issues, just the speed bumps you have to go through in regards to getting the network prepared to allow the traffic in and out of the hospital. It seems to have gotten a little bit easier as the technology has advanced. In the beginning, you had to kind of jump through some hoops to get it on the network just in general to be able to share those resources. Then the security side of it was always a challenge - how you opened up your firewall to let traffic in and out, how calls were initiated…Now with resources like PSPN or 'XYZ' you kind of have one pinhole in the firewall and it allows anybody to call you or for me to call anybody…So, our biggest hurdle right now is the cost to get everything upgraded to be able to accommodate the new system where it's as simple as plug and dial…We'd like to get it at some of our remote sites and, again, we'd like to get to where we have a couple of carts at each facility so that doctors can actually do their, you know, better… their whatever… work with the patients."

Regardless of clinical setting, the largest barrier to adoption was identified as the lack of comprehensive reimbursement for services provided via telehealth applications. These types of external issues related to telehealth can have a ripple effect on the adoption and diffusion of telehealth services such as stroke (O'Toole Jr., Slade, Brewer, & Gase, 2011). Reimbursement for services can affect every area of telehealth including the initial procurement of equipment to the eventual support of clinicians who were tasked with providing services. Without revenues to support the investments being made, it is difficult to justify the expenses. Clara C05 explained the predicament this way:

> "I think the biggest barrier that still exists – and you're talking from the early 2000s to today – is the fact that the Government does not want to consider this as a payable service and reimburse for those services that are being provided to remotely monitor patients. So, it's still a big barrier because it's an operating cost that agencies have to pick up and be able to justify that operating cost somewhere else or making it up in volumes so that they can continue to provide that service…And in our world of reimbursement being cut continually, it's one of those services that you really have to look at where is it going to benefit, and be able to have all your data and your statistics to support why you need to do that service since it is solely an operating cost at that time."

Tonya C02 addressed the issues of the return on investment (ROI) in a complementary way while also touching on contributing barriers:

> "I think that the issues would be that it's costly. The equipment is costly. There has to be a real commitment by the provider to find a way to pay for it. I think it's kind of hard to show the return on investment because they're not always direct. I think having organizational commitment is the one thing that's going to make you successful no matter what, if you can have high-level organizational commitment. Otherwise the barriers are the credentialing, the technology reliability, the resource availability of your consultant, and then someone to keep track of it all and to make sure it's working. There are so many components and it's so new that we don't know what to anticipate yet as far as barriers."

External factors, such as legislation, remained a critical barrier to ensure reimbursement for services as described by Henry T02:

> "Oh yeah. It takes money to do this and at some point if the providers are not going to be reimbursed for it, it's going to die. And I think legislation to help the providers along and pay it, you know, making sure that there's money available and stuff is of a benefit. It's the only way you can go. Somebody's got to pay for it."

The number of applications being offered at a location can also be problematic when each new site brings with it a different piece of equipment and a different protocol for connecting to far sites. As a technical champion tasked with making all of the services

work, Robert T01 had firsthand experience with issues surrounding the deployment and maintenance of multiple applications:

> "Well, I can say not so much on the implementation phase but on the maintenance phase one of the obstacles – and I think others would agree – is the platforms. Telestroke, for instance - the 'XYZ' - they use one platform. Telepsychiatry uses another platform. In our scenario, maternal fetal uses the same platform as like telepsych, but telepsych maintains their systems end to end, so there's no cross-over, right. At the same time, I've tried to champion a project to introduce more telemedicine, and that was the barrier, was platforms. So, we'd had to buy a whole other platform for each of the locations utilizing it. So, if all these guys were working on the same platform and on the same communication lines and so on and so forth, then it'd be much easier to introduce that, right…Well, unfortunately we can't necessarily work around it, so sometimes that ends up being the stop on the project. If I can't get approval for funding or… The champion was not able to get funding to be able to get the hardware in place. At least that was one reason that I'm aware of that shot it down. There could have been others but I don't know that for a fact."

Cultural challenges also exist within the provider communities. When the standards of care are changed that dictate how patients are treated, it can create unease within provider communities. Education and training are needed at all levels to make sure that providers are engaging in the latest standards of care and are able to embrace the changes in practice necessary for supporting the telehealth application (Meyer et al., 2012). An example is the area of stroke consultations where time is of the essence to make decisions about administering a brain saving drug and/or transporting a patient to a regional hub hospital. Ethan C01 had seen these clinical cultural issues play out in his organization:

> "They just don't want to be calling a neurologist - bothering a neurologist - if they don't absolutely know they're going to need one. So, the idea of going ahead and consulting them early, before the CT is even back sometimes, and getting them on the phone waiting…You know, they'll hesitate to go ahead and make that call. So, to me that's one barrier in a way, because I think [the consulting service] would prefer if we go ahead

> and make the consults, go ahead and initiate them, and then if we don't need them then that's fine, you know."

Tonya C02 added to this thought and expanded on the importance of different types of champions at sites away from the regional hospital and the types of process change involved:

> "But I would say some of the barriers that I think we had here that may be specific to us, that may be part of our issues, is our neurologists, I think, would benefit from some more clarity in what the expectation is of a telestroke consult. I don't think that we've had a standard set by their leadership on what they should do. And then the next barrier is that we don't require an ER physician champion in our telestroke sites. And I think that if we had the commitment at the beginning for having that, that we wouldn't have so much variability consult to consult or ER [Emergency Room] to ER if we as an organization here said in order to work with you we need you to give us a physician champion…. So, I think we have a real disconnect between the nurses and the doctors in the ER and what the hospital administration wants to do, because the decision to go with the telestroke is at the administration level, at the top leadership level, and they send it to the ER staff to implement it and then that's who I collaborate with. And from what I can tell they're never on the same page – or they're rarely on the same page."

Several champions reported being empowered by the collaborative nature of telehealth to treat patients at their location for conditions they would have previously referred out. Ann C04 articulated changes in her practice this way:

> "Well, it encouraged me to take on much more difficult cases because I knew I had somebody to contact or consult. So, I was willing to help the patients that had nobody else to help because I knew someone had my back. And even if the other clinician didn't see the patient, at least I could talk to them and show them things."

Others saw the need for a trickledown approach from management to ensure usage, as well as, someone to conceptually package the services in a way that would inspire participation. Vuononvirta et al. (2009) reported similar findings in their study of the

rates of technical adoption within Finnish health centers. Management must take a clear and early interest to either highly encourage or mandate participation and dissuade negative attitudes from taking over. Kim E04 offered the following perspective:

> "I think it goes back to your upper management just… I think once you get people using it and they realize what's there and what's available then it's more interesting…But I think it has to come from somebody there making it sound interesting so that people *want* to see it. I mean, I think it's going to take somebody who really has those skills to actually roll it out and push it out; they have the skills to take this plain piece of paper right here and just make it sound like the best thing in the world. And I think you've got to have those skills just to get those people's attention to it and wanting to see what it's about. And I think once they do that then it will roll out more smoothly. But I think it's going to take at least that kind of push from them. And it has to have the trickledown affect. I mean, you have to take your upper management to make your directors push it out to your staff to make anything work, because again if you just put it out there and you don't really tell anybody what it's about, you don't really suggest that they do it, you don't give them all the information, then it's not going to be something they're going to be interested in."

The adoption of technology within the healthcare environment has historically been low as detailed by Zanaboni and Wootton (2012). Real world examples of slow adoption issues in healthcare were reflected in Robert T01's summation:

> "My view is I think it'll continue to blossom. I think because it's such a large undertaking and it's very different it's caused it to take a while to be adopted. You know, it's slow from the aspect of like technology, because we're used to technology moving at a very fast pace. But because, I think, it's clinical in nature and it's just utilizing technology, I think it's been important that it not run too fast to ensure that patient safety was always considered. But I think we'll continue to see it evolve. In healthcare, it's like in most industries, you've got to figure out how to do more with less."

The implementation of new technologies is a significant staffing and process issue in healthcare. Clara C05 reflected on the way her organization rolled out the applications and how staff education helped to overcome some of the barriers:

> "You talked about barriers in the beginning, and way back when we did this full implementation of it probably a barrier was staff buy-in that I had mentioned. And because of that fact of them wanting to know, '*well, what is this really going to do?'* A lot of times staff saw it as '*oh my gosh, it's one more thing I have to keep up with'*.
>
> And when we decided to narrow it down to a small group of people and a diagnosis [disease focal area] and we were able to give more intense training to those individuals and more explanations of this is why we're doing this, the results we expect and what we're monitoring, what we found was the buy-in was so much greater and they actually felt ownership to '*oh, I'm going to make this successful and this is the reason why I'm doing this'*.

Figure 4.4. Sub-Ordinate Themes: *Agents of Change*

Pushing Boundaries – e.g. 'explain why I shouldn't be thrown in jail' (John E03)

Changes in Care – e.g. 'somebody's always going to be able to see that' (Clara C05)

Overcoming Barriers – e.g. 'Somebody's got to pay for it.' (Henry T02)

Culture Changes – e.g. 'make the consults, go ahead and initiate them' (Ethan C01)

Ownership – e.g. 'the light bulb coming on' (Davis T04)

Engagement – e.g. 'You build it…' (George C06)

Getting the proverbial light bulb to come on can be the hardest part of changing the culture as described by Davis T04:

> "The problem now that we face from an operations standpoint is going to be the light bulb coming on and them telling us: 'Okay, we're ready to do this,' – meaning the providers have to buy into it, meaning the management team has to buy into it, and the financial side, the billing side, has to know that we're going to do it correctly without the insurance companies denying the claims…So, that's the biggest problem we face now is embracing the department of telehealth, because we haven't planned for that phase yet. And we know that it's time to do it. It's a matter of now everybody coming together and doing it…We change the culture, yeah. We've got to change the culture. But how do we get to that other than one patient at a time. I think that eventually enough word will get out into the public, just like any other campaign, and they'll come in asking about it, but it's a hard sell right now."

Changes in the approach used to train and educate staff and providers have yielded better outcomes; but even minor issues, when occurring in the midst of a critical consult, can be problematic as described by Ethan C01:

> "Well, the education was just a matter of reinforcing it until they got comfortable with it. But then perception kind of goes along with education, because when staff weren't as familiar with using the equipment, then physicians get a bad perception of the whole experience and blame it on the equipment and the service and all. So, it kind of goes hand-in-hand. If you can get staff really familiar with the equipment…That's why I say it's been a gradual thing for us. The more staff have become familiar and can make it a smooth process the more physicians view it as a valuable thing and a favorable thing instead of the other way around…You know, some of the things are kind of minor actually, but they're not minor in the grand scheme of things whenever they're being a giant barrier."

Champions within the provider and patient levels can also be seen being essential agents of change to help address adoption issues. John E03 explained:

> "I think you really do have to have champions. They could be champions amongst the providers. There has to be champions amongst those who receive the information – the patients. And if you don't have those you can have everything else right and not go anywhere."

In conclusion, George C06 illustrated participant experiences of adoption related to telehealth using common examples of progress:

> "There's an interesting thing that's happened here. It's almost like the analogy if you take a crossroads where there's nothing much there, you build a service station, in six months there's another service station on the other corner…So, I have found that wherever you start this process and dedicate yourself to it to make people aware of it – advertise it – people come. It's almost like a baseball field. You build it…[and they will come]."

Knowledge Brokers

Telehealth does not happen in a vacuum and quite a bit of education for all champions was required for them to reach their full potential. Gattoni and Tenzek (2010) cite *telecompetence*, along with *provider resistance* and *trust*, as being the three potential areas of issue for emerging telehealth networks. Not surprisingly, telehealth champions are seen as the go to resources for managers, colleagues and staff alike (see Figure 4.5). As a result, their knowledge is acquired and applied across telehealth applications. Nathan T05 described his personal philosophy about self-education and preparation this way:

> "…what I've done is I've positioned myself in what I would call for maybe lack of a better term 'the marketplace'. I've been attending conferences and seminars, trying to learn as much as I can about these technologies in order to be able to make good, sound educational decisions when it comes to these types of initiatives that come up to the plate… So, learning more about the other side of the telehealth, the applied side of telehealth where you actually see what physicians and what these companies are attempting to do to expand this type of service."

John E03 was an early collaborator and engaged in telehealth activities at the national level. A good number of the participants referenced professional associations, such as the American Telemedicine Association, as valuable resources. John E03 explains the value of an educating entity:

> "Well, I found it very helpful to go to the American Telemedicine Association – the ATA – and we would listen to how people would do it in Oregon and California and Texas and all over the place. And we always came back full of ideas and things we would try out. Some worked, some didn't. It was also reassuring to see that some of the issues we were dealing with were common. Everyone was dealing with the financial issue of getting services paid for, everyone was dealing with the legal threats, and there was a lot of exchange of how to get the right kind of legislation in your state started and that sort of stuff. Now, of course, there was

> always the latest technology advances and so forth, but it was mostly seeing the problems other states had and how they came to solve it."

As described by Robin et al. (2011), participants could help themselves to navigate the changing telehealth landscape by utilizing technology and being life-long learners. George C06 stressed the importance of taking personal ownership for his understanding of the changes in telehealth:

> "So, it pays for us to stay tuned to all new developments. I know deep reading was recommended to me years ago in this field as something that will always stand ready - I've tried to practice that. So, reading both technically in the field and reading numerous other things to get trends and tendencies. Then, you can say: 'A-ha, I wonder if that will work over here.' And sure enough some of those connections do work."

The importance of applying knowledge and building relationships cannot be overstated in the development and refinement of new telehealth applications. Beth C03 explained:

> "So, there are many champions within the organization to develop a successful telemedicine program. I am currently identifying how many people will be impacted by the work that we're trying to do. Our goal is to develop processes that make the providers' work efficient and effective and in the process so make a difference in patient outcomes.
>
> It really is a relationship-building job. I love being able to connect people and put the telemedicine puzzle together. I love finding the right pieces so that we have a beautiful, cohesive picture where we're making a difference.
>
> Additionally, I work with the external hospitals, the spokes and the physician practices. And the relationship building is similar. You have to work with these groups to ensure that they feel that they are a valuable part of the process."

Being able to speak and demonstrate applications from experience was one way that participants applied knowledge in order to strengthen relationships. Ethan C01 stated:

> "The way I'd probably answer that was just through education and kind of role-modeling probably. You know, going and becoming familiar with the system myself so that I could go and facilitate a smooth consultation whenever we would do one so that people wouldn't be afraid of it."

Often those experiences were similar to other processes being used to deliver care, but distinctive perspectives emerged. Henry T02 had a unique way of describing this experience:

> "I think what was applied from what we knew here to the telehealth was… in other words it was the other way around. I think that being willing to participate in not only that but the same method and methods of moving the data are the same in telehealth and the everyday way of doing things. So, I think it's more a reverse. Have there been some things that I've learned through telehealth? 'Yes'. One is that video and audio and all these things are a challenge. So, it kind of bumps your awareness of what's going on in my network. Why do these things want to be flaky? So, yes, there is a positive from that aspect of kind of opening my eyes and saying, 'Hey, it's more than just a string of zeros and ones'."

All of these components of telehealth have to work well together due to their interdependency. None of the telehealth activities can be fully implemented without all factors being aligned. The ability to support new frameworks using collaborative, *virtual environments*, is essential for the advancement and support of quality clinical services (Standing et al., 2011). Robert T01 explained:

> "And I think that probably carries over… well, not probably, I *know* it carries over to the clinical side. You can have the doctor, but if you don't have a decent conduit to get that telehealth experience out there, it doesn't matter. Same thing: you can have the best technology, but then the doctor becomes the critical factor. So, all pieces of that have to work – the business side of it, the reimbursement and so on and so forth, regulation. All those pieces have to fall in line just as well as the others."

From the experiences champions described, many serve as trusted advisors. The knowledge they gained from external sources is invaluable in the decision-making processes for their organizations. George C06 stated, "frequently that by my working with other hospitals both in state and out of state I learn far more in the exchange than I think I share."

Figure 4.5. Sub-Ordinate Themes: *Knowledge Brokers*

Building Relationships – e.g. 'I love being able to connect people' (Beth C03)

Role Modeling – e.g. 'so people wouldn't be afraid of it' (Ethan C01)

Borrowing – e.g. 'tap on to people who had been doing it' (Clara C05)

Continuum of Care – e.g. 'be kind on the same page as people that we partner with' (Sarah E05)

Prepare – e.g. 'measure twice, cut once' (Davis T04)

Not all telehealth applications and processes have to be created from scratch. Many participants, along with Clara C05, were able to leverage other programs that were further along to accelerate the development of processes:

> "Since we were not like a pioneer of it - we came into it a little bit in - we were able to tap on to people who had been doing it, especially for policies and procedures and protocols that they had developed. So, that was very useful. For things like your consent forms, cleaning, those type of things, that was very beneficial for us."

Obtaining buy-in from internal and external partners is crucial. Beth's perspective showed how champion leaders navigate these situations:

> "…I realize that I need to have an advisory council. Developing a telemedicine program requires the input and guidance from a lot of different departments. Having more people involved in the development of the program will create 'buy-in'."

Again, education and knowledge sharing permeate the telehealth environment and can result in actual practice change and, theoretically, improved care for the patient. New

educational delivery systems also have the ability to further evidenced-based care out into community practice as promoted by Schleyer et al. (2012). This improved care becomes even more important when multiple organizations are involved with the care of a patient across the continuum. Sarah E05 shared her experience:

> "Well, I know the pediatric groups have looked at some of those grand rounds that they've done. And I know they're looking at changing some of their processes based on some of the information that they were able to obtain over that. Now, the ED has done a little bit of that as well…Particularly in our peds department we do a lot of referrals either to Columbia or Charleston, so we like to kind of do the same things that they do down there. So, it does promote standardization, because if we transfer an infant or a child we want to be kind on the same page as people that we partner with for continued care."

Still, not all organizations are comfortable sharing their knowledge. The reasons vary, but most are likely linked to the competitive nature of regional hub hospitals for patients and prestige. Tonya C02 shared:

> "I don't necessarily know what's unique to our organization because I haven't spoken in-depth to other coordinators doing this particularly. The coordinators that I know who do this they're…Generally, Stroke Coordinators collaborate and are willing to share information, but this is a new field and I don't think we have the comfort…and I think sometimes our hospital administration suggests that we're not ready to share our processes with each other yet. I think that's maybe why we haven't really had that opportunity."

Sometimes champions felt like they were behind the leading edge, but after speaking with other organizations, they surprised themselves. William T03 stated:

> "One of the things that [my manager] and I have discussed is that here in [XYZ] we've got some things that are a little bit ahead of the game, but even we don't recognize that until we're talking to somebody else and they go… you know, they kind of look at us tilted head going: 'Really?' So, this is just one more opportunity to kind of be excited about and try to take it and build off of it and grow."

Within telehealth, multiple opportunities exist for mentoring and mentorship activities. Giving back was a common concept explored by the participants. George C06 recommends to those just starting out:

> "I think if they would identify one to two mentors that they can follow, listen to, build from. Not that they have to be a copycat, but I have been taught so many things by so many people just by associating with folks who have many of the qualities that I just shared with you. I have to say that a good bit of what I learned I learned from others."

Closing with the concept of nurturing strong relationships, utilizing continuing education, engaging in wise decision-making and starting from a point of solid preparation, Davis T04 advised:

> "[The first thing is to]…align yourself with good people that you want to work that get what you're trying to do, and they respect you. Make sure you align yourself in that way. The second thing is make sure you prepare yourself for success. Don't buy a bunch of stuff because someone told you to and expect that it's going to work. Make sure that you do...The old thing that daddy taught me was, you know, measure twice, cut once. Make sure that you are doing your homework, that you know what you're going to invest in, and that you know you have a good support system to make it work."

Supported by Management (Three Thematic Perspectives)

Related to the concept of support, participants were also impacted by the levels and types of support management provided to telehealth activities (see Figure 4.6). Zanaboni and Lettieri (2011) cited strong managerial decision-making as one of the most

important, and often missing, elements needed for successful telehealth adoption. Interview data reflected significant differences in the support of telehealth champions based on their professional roles. As a result, the findings are presented here by champion roles and themes specific to their experiences.

For **clinical participants**, telehealth activities were often seen as part of the organization's larger mission. As such, energy and resources were widely available to support the implementation and growth of telehealth activities. Clinical administrators cited this support as being partially cultivated through organizational channels, but also provided personally by those professionals involved with telehealth activities. Beth C03 explained:

> "The goals, mission and vision at 'XYZ' are to provide the highest quality and most cost-effective care for patients. The hospital administration has also established a multi-year goal that is focused on "advancing clinical integration across the care continuum"…Every single person I've met within the 'XYZ' organization has been receptive, excited and interested to be involved and to provide support for telemedicine. And I don't know if it's because it impacts them that greatly with their job, or is it partly personal, but there's a lot of enthusiasm and support."

Support from management is easier to maintain when clinical data can be shown to improve care *and* provide the necessary return on investment to be sustainable. While not all champions were able to demonstrate sustainability at their current activity levels, all reported working towards this goal. Clara C05 provided an example of how data could beneficial when garnering managerial support:

> "Administration has been very supportive of the technology of utilizing telemonitors. We actually with our own healthcare facility decided several years ago – it's been about three years ago – to really focus on the readmissions. So, in the past we had deployed telemonitors just on a wide range of patient diagnoses, nothing really specific. So, about three years

> ago, we decided that we needed to really hone the program, and we developed a congestive heart failure program with our hospital that involved utilization of those monitors solely on the congestive heart failure patients. In addition to use of the monitor, there was a real defined program that they had to go through that was associated with a telemonitor. So, Administration was very supportive of that program, and when they started seeing the results they became very supportive of expansion – you know, the use of having more monitors. So, we hope to continue that. That'll show the results…"

Strong leadership from managers who oversee clinical operations was seen as leading to organizations *getting it right* and *doing the right thing for patients.* While this can be seen as a natural extension of the altruistic nature of healthcare, seeing it in practice is not always common. Ethan C01 explained how support evolved and outcomes resulted through visionary leadership:

> "My director is over several different areas of the hospital…She's an amazing leader, and clearly she's thought of very highly to be able to have responsibility over all those areas. But I've had her full support this whole time. Any time I have any questions or anything I can go to her… And basically, it was a strategic board initiative that we become a primary stroke center. Our CEO was in that meeting and the board members, and then I would go to those meetings and I would go to other upper administrative, you know, VP meetings and that sort of thing, and everyone – all the administration in the organization – I could tell by the feedback and everything that they knew that this was the right thing to do for our community. So, the whole entire time, I had whatever kind of leadership support I needed, and I would not have been able to do any of this without everybody's buy-in."

Whether it is the nature of telehealth to be seen as new, or the positive results that it can generate, the support of management can be seen in a highly engaged leadership. George C06 detailed his experience:

> "You know, that's an interesting question…Over the years I've been with 'XYZ' health, I've been associated with a number of different areas. But I've never been responsible for an area where twice a month I meet with

> the agency director and his leadership team for up to a full hour to review, to innovate, to monitor, to enhance, to change program elements. I do get face time regularly and any other time I need because of the value of this program. In my experience that is unusual and it says something about [my director's] commitment to make this program effective."

While all clinical participants shared experiences that included support from management (overt or implied), how support from leadership affected buy-in and the direction buy-in came from was also important. Tonya C02 explained:

> "So, I think we have a real disconnect between the nurses and the doctors in the ER and what the hospital administration wants to do, because the decision to go with the telestroke is at the administration level, at the top leadership level, and they send it to the ER staff to implement it and then that's who I collaborate with. And from what I can tell they're never on the same page – or they're rarely on the same page…Well, I feel like that the telehealth or telestroke capabilities are an extra responsibility for everyone involved, that there's been no one really devoted to the whole picture. So, there's support in that 'good job; keep doing that', but there's very little other available support."

The perspective of the **technology participants** was also based on strong managerial support experiences. At the same time, the control for decisions remained mainly within leadership levels and decisions were driven from outside influences such as hub hospitals and internal influences such as clinical service needs. In fact, clinical services, more so than technological capabilities, have been shown to drive the adoption of telehealth activities (Maarop & Win, 2012). Still, communication about the feasibility and health of the technology between technologists and their leadership, colleagues and staff is one of the central activities related to telehealth. Nathan T05 provided an overview:

> "My managers are some of the most supportive people that I've dealt with in regards to not only the telehealth technology but just technology in general. So, what we do is we have a monthly IT Innovations Committee, and we meet and discuss new and creative initiatives. That creates a

> platform for talking about these types of programs and it's been very productive."

At the core of the conversations, usually lie issues of funding and whether the investment will result in sustainability for the equipment and services. The technical components of telehealth networks have significant upfront costs that cannot often be fronted without the identification of specific resources. Robert T01's experience with the support of management has been:

> "I'm not sure if I could really quantify that. I mean, obviously they're assessing telehealth from their view, from serving the patients' needs, addressing any challenges that we may have as an organization. As far as when it gets into my area and there's a challenge or something, something we have to overcome, usually that falls back to it means money – we've got to buy something or something like that. So, that's the support I look to them for. I guess one way to quantify it would be like the support agreements to be able to receive manufacturer or vendor support. So, I had to rely on Administration for that, to try to justify to them the cost of keeping support agreements on the infrastructure. Luckily they responded, so I can't say that I have any complaints."

In some cases, outside support made the activities possible from the beginning. In order for technology champions to garner the support of management in the form of resources, outside entities had to bring forward opportunities that were accompanied by equipment. Timing was mentioned as more of a consideration for technology champions. They needed to be ready to take advantage of opportunities, but were also dependent on waiting for management's determination of the *right time.* William T03 explained:

> "So, I can definitely say it slowed us down a little bit, but what's helped keep us moving forward are the outside programs like [XYZ] or just the different programs, because other people are showing interest. If it weren't for the other people saying, 'Hey, we want to do this and we want you to be involved,' Administration may have kind of been a little bit more reluctant. I don't think that if I would have come to them with some

> of the hardware that we have on demo and said, 'Hey, we really ought to check this out…' It would have been more like: 'Oh yeah, sure. We will when that time comes.'

After the initial pilot or demonstration project was put in place, recipient organizations had to make decisions about providing their own resources to 1) improve the services; or 2) continue with the services. Here again, technologists were part of the communication loop in providing their assessments about the technologies and processes being utilized on networks they were charged with maintaining. Participants reported that their recommendations to management on which technologies were worth implementing were taken seriously.

Figure 4.6. Sub-Ordinate Themes: *Supported by Management*

Expectations – e.g. 'they're rarely on the same page' (Tonya C02)

Vision – e.g. 'right thing to do for our community' (Ethan C01)

Financial Support – e.g. 'justify to them the cost' (Robert T01)

Budget Issues – e.g. 'number one area that was cut was the education side' (Kim E04)

Leveraging Equipment – e.g. 'We've already taken on that cost.' (Loretta E01)

In compiling the themes for **educational participants**, the researcher noted that they spoke very frequently about the role of management in their experiences. Their perspectives reflected a range of support from leadership being appreciative of the technology to not actively blocking its use for educational purposes. These findings might be more indicative of the role of education in general within healthcare organizations. All educational participants were dependent on equipment and support that had been provided by external entities to support education. John E03 provided a familiar refrain:

> "So, there was never any real money coming in from the state of South Carolina to do this, not through the university as university standard funding. It all came from grants. So, if you can't get the grants and so

forth, you couldn't get started."

Telehealth champions from rural areas spoke most frequently about the role of education in telehealth and the need for support services and training designed to facilitate staff development (see Appendix I). This theme is evident in the literature as described when Curran et al. (2010) advocated for education as an innovative way to address recruitment issues for providers in rural areas and reduce instances of professional isolation. Reductions in funding related to education at hospitals were seen as significantly affecting the ability of healthcare professionals to attend trainings. While suburban and urban participants spoke most frequently about barriers to implementation for telehealth in general, the support rural participants received through education was a key way they saw for addressing those barriers in implementation at the spoke sites. Related to the delivery of education, technology was cited as one-way management was attempting to meet requirements for recertification training and quality improvement initiatives in a tight budget climate. Kim E04 noted:

> "Of course they're pushing it because with all the budget cuts and everything the number one area that was cut was the education side of it. Whereas you used to be able to get paid for going to classes; you got paid for mileage; you got paid for your meals. And of course, all that was cut. Now there are only certain classes that they'll pay for them to go. So, of course they're in favor of it, but as far as them making it mandatory or anything like that, that hasn't been put into place yet…So, they're in favor of it but it's just not something that they say: 'Okay, this is something that you *have* to do.' Sometimes if you don't make it mandatory you don't get nearly as much attendance as you do if it is mandatory."

Loretta E01 expanded on the importance of management support for educational programs:

> "The hard part has been having to get some backup from management as far as making them show up…And just basically getting the promotion from the managers as well. I've had several of them who come to programs and say, 'I wish more people were here.' I wish more people were here too, and they probably would be if they had that opportunity to be off on that specific day…As far as my director or my hospital administration…hospital administration has never attended any of my sessions…"

Because the initial investment in educational activities was through grant funding, educational champions often face sustainability issues for their activities. Most champions pointed to this area as one where support had been received from management. Sarah E05 explained:

> "I guess the only real issue is just the monies for continuing the program now that the grant, you know, was kind of in place. But I've been fortunate from that standpoint that our Vice President's very supportive of this and supportive of education, so we built it into the budget."

Loretta E01 further explained the issues around using distance-learning technologies to support healthcare:

> "Biggest part has been management allowing the staff to attend. The other one is when the nurses or the staff period having the time off that they do, a lot of them don't really want to come in on their day off… And one of the things that we really do to promote this when the staff comes for orientation, always mention to them if they have a certification that they have to maintain, we do have measures in place that will allow you to get those [credits] at no cost to you. We've already taken on that cost. So, we show them the site, we give them the information, and we just encourage them to attend to help them maintain their certifications."

The experiences of telehealth champions can differ greatly based on the support provided by their leadership. Differences stem from the way the program was initiated (internal or external), the funding that was provided or available to sustain the activities,

and the general vision for how telehealth applications fit into the mission of the organization.

Advocates, More Than Champions

Impetus for this research study was found in the passing literature references to "champions" who were in some way essentially responsible for successful telehealth networks. While these champion references appeared as one-line or short section descriptors for implementation tools that were *also* important within telehealth (Gagnon et al., 2012; Joseph et al., 2011; Meyer et al., 2012; Murray et al., 2011; O'Toole Jr. et al., 2011), no research could be found exploring how telehealth champions came to be, how they viewed their roles, what their experiences had been that helped them to overcome barriers or how to replicate their individual successes.

Through in-depth interviews, champions expressed strong opinions about what it meant (or might mean) to be a champion and the personality traits associated with successful telehealth professionals. When asked about how it felt to be identified as a champion, many shied away from the actual term *champion*. In general, champions self-described themselves as being advocates, members of a team or simply being engaging in activities that advocated for a specific outcome (see Figures 4.7 and 4.8). Ann C04 extolled:

> "You have to be an advocate. You can't give up; you have to keep trying. You have to be patient…creative…inventive. Just you have to be an advocate. You have to have one person that's an advocate."

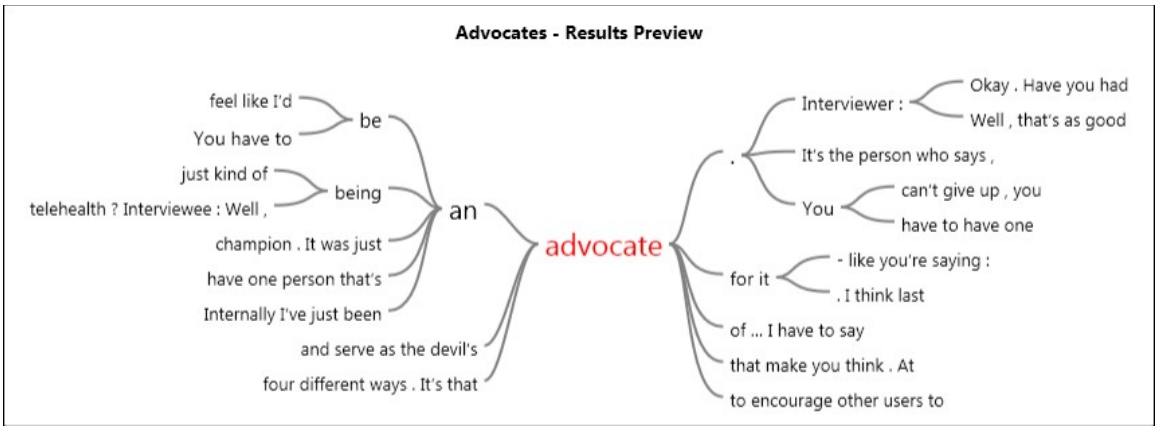


Figure 4.7. NVivo Cluster Analysis of the Term "Advocate"

William T03 differentiated between his activities internally and externally in the context of advocacy:

> "Actually, you know, I can't really say that I've done it outside of the hospital, but internally just kind of being an advocate of… I have to say that I'm being a little bit selfish on this side of things because of all the headaches that I get from the previous methods of connecting telehealth. I always kind of sigh and kind of groan, because it's just so frustrating how you have to set it up. But now with the new technologies…I was probably the loudest. *This is why this is going to be better. This is why we're going to need this. This is how it's going to make everybody's life that much easier*...So, long story short, no, I can't really say that I've done anything outside of the hospital. Internally, I've just been an advocate to encourage other users to be a little bit more open to the new technologies and not to be as aggravated or concerned for aggravation with the old."

Also, a great amount of pride was derived from having been identified as a champion. Often champions framed this in terms of the organization's success as Clara C05 stated:

> "I think it's exciting to know that we were the first agency in our area that implemented telehealth, and we had it for probably three to four years before any other agency decided to. So, it did make us feel like we were champions and we offered something that others didn't, but it also gave us that edge of knowing what does this technology do, how can we perfect this technology and really hone in on those. So, it was an exciting thing for us. We always really kind of said that to our staff - you know, you're the

> only ones doing this – and the staff really like that idea too that no one else was doing this in our area."

Still, the concept of being special was not one that resonated with all participants. The nature of those who work in healthcare appears to skew individual perceptions about generosity and selflessness…it is just *part of the job*. Henry T02's perspective was common:

> "I don't really see myself as being a champion, to be honest. I think one of the things here at [XYZ] is that you do things… and I know it's kind of like a sales pitch they have - you do it because it's the right thing to do, you know. And it's part of my job. So, I feel like when you do your job you give your best and it represents you in the end. So, I don't feel like I'm a champion in it. I just feel like I come in and try to do my best and if it works, good…I don't perceive myself as being that generous. I know how selfish I am. But I do think that the people involved with this, they have to be generous. I come here to work and hopefully I can help the nurses do their job or whoever else that needs my support. So, to me it's all about giving, and that's the reason I love this place. It allows me to give every day. And I get paid for it."

Others articulated their *championess* through examples of how they enlisted their problem-solving skills in response to a specific situation. George C06 added:

> "First of all there was the problem. And that's what folks who are creative problem-solvers do if there's an issue or a problem that needs to be solved. You first draw upon your experience and pull forward whatever you can. You apply the elements that are available to you – I call them 'resource elements' that are currently available today. You see if you can't put together a system or a network to begin solving those problems."

Instead of being a telehealth champion specifically, several participants saw themselves as champions or advocates in broader contexts, such as Beth C03:

> "Oh wow. Yeah, I was thinking: 'I don't think I've done this long enough to be a champion,' but I guess I have. It was surprising to me that somebody would even have said that. I do feel that I'm a champion for health. So, telehealth is just one of those tools that's in the help box that I

> would definitely want to use. So, I think I'm a champion for health and telehealth is a part of that. But it felt really good that somebody… I don't know who said it but I appreciate whoever said that!"
>
> With respect to being identified as a champion for telemedicine, I have a passion for quality patient care and continue to seek out experiences that allow me to express that, such as providing support for our hospitals and working with a committee to support S.C. stroke legislation. As a state, healthcare professionals and organizations are well aware that we cannot do our work without telemedicine."

Regardless, there were some who embraced the term telehealth champion, including Davis T04:

> "My champion side of this was being able to bring everybody together at the table and negotiate those elements so that everybody felt comfortable spending the money in implementing this new technology…Commitment is a personal trait that will require us to be successful. We have to be committed to the cause. So, that has to be the first is the big letter 'C' in making sure that everybody is committed to making it successful…So, we do have to embrace it and we do have to have that commitment as a personal trait. Otherwise, we have to embrace it, you know. That's got to be what our focus is and we've got to embrace it for the future. So, that's the other personal trait that I think is very important in this process. And then there's ownership. We have to accept the fact that this has to be part of the way that we do business in the future because we're thinking about the patient, not about ourselves. And as much as we would love for them to come in to us, we've got to take it to them because of transportation issues or just they don't feel like getting out - you know, not going to be able to leave the house. Well, then what do we do? So, we have to own the process."

In Ethan C01's case, the improved care that had been provided to patients, stroke patients needing lifesaving injections, was a source of pride and potential *championess*:

> "It's just… I don't know. It's very humbling. It's rewarding to me to pull back and see where we started from with our door-to-needle times…90 minutes…120 minutes. And now we've almost got them under 60. That's pretty good."

Others had used their access to technology to extend their knowledge and skills to a new generation. Margaret E02 described her transition:

> "I feel a little bit honored, a little bit shocked that somebody would say that, but it feels nice to know that maybe it did make a difference for somebody in some different way – in a new way. It's the old nurse in me, you know, that can't get out and do the clinical stuff anymore. I have to tell myself that I am still helping nursing; I'm teaching them just in a different way. I may not be at the bedside teaching, but I am teaching nurses in a different way now."

The excitement about telehealth in general was palpable. George C06's added:

> "I think it's indicative of everything you and I have said to date; that we're involved in a fast-moving system, a valuable system. We're committed to making sure in our respective jobs that we want to do as well as we can and we're committed. People who know me know I get excited about this. I tell them early on I can be evangelistic about what I'm doing, but I won't 'pass the offering plate'…

Regardless of how they had come to be involved in telehealth, champions placed a high-value on the services they provide as part of the technology. Telehealth demonstrated a universal ability to inspire the participants as described by Nathan T05:

> "It's hard to comprehend sitting here today in 2013. I've been at this facility for 18 months and it's been overwhelming but it's the place where I want to be…If you take apart every component of my position, if I had to pick one area that I would like to focus on this is it. And that is worth gold both to me and to my employer, because they understand that there will be a commitment and dedication to that effort. And it's very, very, very exciting. You could think of 20 of the top technologies out there today. Telehealth has to be up there. I mean it's such an interesting and dynamic and rewarding type of situation."

The researcher specifically asked the participants to share the personality traits they thought were important for someone to be considered a telehealth champion. Several

participants had given the topic some considerable prior thought. George C06 responded with a list that was very comprehensive:

> "A positive attitude. It starts there. A creative perspective; having an attraction to problem-solving rather than being repelled by problem-solving; interested in adding value to systems, in our case healthcare. Being able to manage multiple agendas at the same time is real interesting…having energy – being energetic; having good people skills. And part of that, of course, is knowing how to be a good team player. You can never do this alone…But I work on systems and I work on processes and try to enhance or fix them…You've got to be a good listener in order to know where people are and where they need to go and how you can help them get there using this kind of technology. Have a balance between a long-range vision and the critical steps to get there. I'm reminded that we're like climbing a ladder; that every time we go up a rung, there's another rung above it. So, we never quite get to the top but we know that it's a step at a time. So, be able to balance both of those simultaneously. I mentioned dedicated to improving services. Being comfortable with being a pioneer or being a leader…Another characteristic is probably having a bit of risk-taker attitude. I'm referring to the pioneer business. You don't meet many settlers doing what we do. You meet a lot of pioneers. That means that you can meet a number of fairly strong personalities by virtue of being a pioneer. And that's okay; we're used to negotiating strong personalities. Practicing what I call 'southern schmooze'…I learned early to call on somebody personally, have a cup of coffee with them, get to know them for five to ten minutes and then do business. And I call that 'southern schmooze'. So, managing stress probably is the last characteristics I'll name. You may develop a bit of a crocodile skin, but you've really got to be able to manage 'a thousand balls in the air' simultaneously. Those balls create a lot of stress because we are prone to be influenced by a lot of key

Figure 4.8. Sub-Ordinate Themes: *Advocates, More than Champions*

Advocates Are – e.g. 'patient…creative… inventive' (Ann C04)

Not An Advocate – e.g. 'I don't perceive myself as being that generous' (Henry T02)

Ownership – e.g. 'So, we have to own the process.' (Davis T04)

New Approach – e.g. 'I am teaching nurses in a different way now' (Margaret E02)

Conviction – e.g. 'I need you to change' (Tonya C02)

> decision-makers. In this business particularly, you're so exposed and everybody seems to know it. So, you have to deal with the stress of the job; learn to leave each at home – home problems at home; job problems on the job."

Tonya C02 added her perspective about how champions are required to strike a balance personally when leading others through process changes:

> "Well, for my role I think you have to have a good understanding of how things should occur, what the standards should be, and then you have to have a lot of tact and ability to see other people's perspective, because everybody has to engage positively in order for the program to be successful. So, I think you have to be willing to see what it looks like from someone else's perspective and how you can help people overcome their barriers. But I do think you also then have to have the conviction to say, 'I need you to change,' or 'I need you to do something different.' That's what I've seen so far is you have to have the knowledge, you have to have the tact, and you have to have the conviction. And then behind that you have to know that whatever you require or are asking for is going to be supported by your hospital's leadership in case any issues arise. And I think what we should do in the future is be more clear in our agreements upfront of what we need for that collaboration."

William T03 concluded with common, but wise words of warning and encouragement for those looking to start telehealth networks:

> "Oh wow. I'm never good at stuff like this. I mean, just don't be scared. I think everybody's scared of technology, but I think one of the great things is… from my experience – and I've been in that situation where you had to know a little bit about a lot of things – and to me if there's anything that I've learned it's just roll your sleeves up and get into it because it's not as hard as it seems and the benefits outweigh all of the what ifs. And don't avoid it; it's coming!"

Well-Prepared Visionaries

Before presenting the final sub-ordinate theme, the researcher would like to note that the experiences of telehealth champions are rich and equally varied but do have many

recurring themes. The perspectives of quite a few champions are shared in this section as a way of illustrating their commonalities and sharing the very informative opinions they have developed as part of their journeys. These experiences, relayed in the participants' own words, could prove beneficial for those following their example.

The final theme touches on many aspects of the previous themes, and is significant for its incorporation of ideas ranging from preparation to inspiration. By the conclusion of each interview, most participants had become more at ease with the term *telehealth champion* and were willing to share their visions for where telehealth activities would lead their organizations (see Figure 4.8). They also shared their perspectives on how they had meticulously prepared for their current roles *and* simultaneously for the future needs of their organizations and communities. Participants portrayed the sum of their previous experiences as steps towards the next level of adoption, diffusion or sustainability. As Rogers (2003) illustrated, knowledge does not implicitly equal adoption, adoption does not always result in diffusion, and even with diffusion, innovative approaches must be strategically supported in order to achieve sustainability. Specifically, participants gave voice to how would they like to see technologies and processes improve and what roles they saw for themselves going forward.

First and foremost, telehealth champions are tasked with making things happen – especially for future initiatives and locations far away from a hub site. Nathan T05 explained his ongoing challenges with expanding to rural sites:

> "So, now it's down to me to figure out how we can get the infrastructure to where it needs to expand our program…If they're very rural, you may not have that many options, but the great thing is that there's always a way."

Champions constantly were looking down the road in a very iterative process of assessing and reassessing services. Davis T04 shared his process:

> "So, I spent a lot of time the first few years just understanding what we wanted this place to look like as it is today. And now I'm thinking two years down the road about, well, how do I want it to look tomorrow? And telemedicine is a big piece of that, so that we can have providers in one place and they can be seeing patients all over 'XYZ' County without ever having to leave here, which makes them more efficient and the patient didn't have to travel as far. Ultimately it might be that we can see them in the home, but today as a xyz, the Government says: 'No, you're going to have to see them in an office setting.' So, we're kind of pushing the barrier by saying: 'Hey, we're going to see them over a video conference instead of in person.'…And, you know, the beautiful thing about these little devices right here is this insurgence - and I know that it's going to have regulation issues – but this insurgence of doing an EKG and a BP and a blood sugar right off of this device…Well, if the public can take a cellphone and get their healthcare taken care of off of this device, then the matter of a provider connecting to that device and downloading that information into the [electronic health record] securely… the power of that is amazing, because just from that alone…the provider can generate the face recognition, the vital signs, the color of the skin, and the ability then to write a prescription or update a prescription and the patient never had to leave the house. And if it's mail order - which we have a huge number of maintenance drugs that are mail order – well, then it's going to come to their house and the patient never had to leave. So, that's huge for us, especially for the patients that we have that live in this underserved and underinsured population."

Henry T02 added two separate thoughts about planning for the future and being prepared for the future in terms of health information technology security. Others – mainly technologists – echoed Henry T02's views:

> "But really to make something successful you've got to go back to the 80/20 rule - planning and then implementation…So, in other words, if there's a lot of questions before you start, get that done in the planning stage and not in the implementation. I think the 80/20 rule."

Regarding the security of an organization's infrastructure, the technologists were especially cognizant of the challenges. Henry T02 continued:

> "It's an extension of the individual. I somewhat agree with that analogy that it's almost like a child or something and yet it's a little bit in some ways… you know there's a lot of things that could happen that you just say, 'I've got to do whatever I can to make sure that that doesn't happen.' It's hard when you're extending your network beyond areas that you normally wouldn't do. It used to be there was a saying: 'Trust and verify'. With IT people, I think it's almost reversed: you verify and then you trust. And then not only do you verify but even after you learn to trust you keep on verifying."

Issues, such as security, will be ever more important as technology advances and more of patients' private medical information will be stored and accessible on external systems. Other considerations related to technology remain especially related to ongoing cycles of innovation. Moore's (2004) innovation types – *disruptive, application and product* – are particularly pertinent to telehealth applications because of the multiple layers of adoption that are occurring with different telehealth services, platforms, regulations and reimbursements. William T03's experience was shared among those tasked with implementation of new technologies:

> "So, our biggest hurdle right now is the cost to get everything upgraded to be able to accommodate the new system where it's as simple as plug and dial. Network-wise we've got the resources. Hardware-wise we've got a couple of pieces of equipment for demos we're using. But we'd like to see that everywhere. We'd like to get it in all our conference rooms. We'd like to get it at some of our remote sites and, again, we'd like to get to where we have a couple of carts at each facility so that doctors can actually do their, you know, better… their whatever… work with the patients.
>
> Yeah, absolutely, because there's money that gets invested in existing hardware and then the next latest greatest comes out. It wasn't cheap to install a lot of the hardware in some of the environment and then the next

> year something easier comes out and you have to revamp the entire thing. It's just a hard fight to… It's a slippery slope…"

Not trying to recreate the wheel, but using similar strategies for the deployment of new technologies was also a common refrain. George C06 added:

> "So, I am already looking at lower-cost packages. I'm looking at desktop, laptop and tablets. And I'm having a lot of fun with that, because once again I'm having to create a wedge to get in here to say to folks: 'Now, this tablet can do all of *these* things'…So, I'm having to use the experience of putting carts out. The only term I know is 'disruptive technology', because now that we've gotten them used to carts, we're talking about something else, something new. Well, we know that for $1000 to $1200 you can get a [tablet] that could do many of the same things."

Still, traditional problems of distance exist even with modern technologies. John E03 described a predicament that remains:

> "I think the one thing that I could never answer was even out in rural areas people had to get to the physician's office. And back in those days – I don't know what it's like now – but there were a number of people who just didn't have automobiles to go see the physician. In fact, it was an issue for just providing general healthcare, especially in communities that didn't happen to have a physician in town…And you had to drive to another town nearby or whatever. So, if you could now have… People have smartphones with video on it and cameras. I would think that that would be a definite improvement in providing better healthcare if that were implemented for the purposes of healthcare. And that means that the clinical sites need to be able to accept that information and act upon it. So, that's where

Figure 4.9. Sub-Ordinate Themes: *Well-Prepared Visionaries*

Persistence– e.g. 'there's always a way' (Nathan T05)

Change – e.g. 'the beautiful thing about these little devices right here is this insurgence' (Davis T04)

Planning – e.g. 'the 80/20 rule' (Henry T02)

Redundancy – e.g. 'how do we alert everybody' (Beth C03)

Vision – e.g. 'Where is this train going?' (George C06)

> I would go and we'll see how you can make this something really focused on the patient and in the home, because I think people are not afraid of it anymore."

Especially when the technology is put into place, new procedures have to be developed to support essential processes that are technology dependent. Beth C03 cited a common example of how procedures are developed in support of new processes:

> "The biggest lesson I've learned from this is to make sure that you have a redundancy plan for when the technology doesn't work. Is it a technical redundancy plan or is it a process redundancy plan or is it both? And I'm working to develop that to make sure that if we have issues with that, that we can resolve those real quickly, or the physicians know exactly what they're supposed to do and how do we alert everybody."

As the telehealth champions have demonstrated, the passion and skills required to make telehealth applications successful are largely in place within their organizations. External factors remain key barriers to the diffusion and sustainability of initiatives as described by Ann C04:

> "I didn't have a problem being reimbursed, but I can see where expanding the program out into the schools might be a problem if there's not a provider there as far as reimbursement. The partnerships are being established, so really it's the reimbursement that's holding everything up…I know the insurance companies are concerned that services will increase, but if necessary services increase then we are doing a lot of things right. We're providing preventive services instead of end-stage. I can only see it being a wonderful thing. I hope to see a telemedicine unit in every practice."

Expansion of services out of the hospital and into the community remains a priority for many including, Ethan C01:

> "I guess it'll probably expand – not my role will expand – but my involvement with telehealth probably will expand. I wonder if it'll involve maybe some even primary prevention-type things possibly. The way things are going it seems like everything is really moving toward shifting

> things out of the hospital into the community. So, it seems to me that's probably going be… I mean, telemedicine's role will be huge when it comes to that, you know. In my mind, I'm thinking that eventually home health nurses will probably have iPads showing physicians to the patient out in the field, you know. I don't know."

Going forward, relationships and technologies will need to be blended and tended to in new ways. Some champions stressed that not all will be rosy and the path is uncharted. Margaret E02 provided her view going forward:

> "What do I see…? There is a little bit of loss, you know, as we use it more and more with patients, even though it's face-to-face, so to speak… I think there is a little bit of loss for, you know… It forwards the science of nursing, but there's a little loss for the art of nursing. I think the nurse is going to have to work so much harder to keep the art of nursing in telehealth medicine.
>
> Another part that I think that's going to be an issue is as the younger generations come into nursing with their fingers doing this texting automatically and all. Telehealth is going to be based on communication skills and they don't have as much communication skills, because they're communicating mainly through their fingers. So, I think there's going to have to be some support for them to learn how to communicate, because I don't think they'll get it in nursing schools.
>
> You know, it's not the technology. I think just if somebody is going to be using it, there needs to be somebody there to teach them how to do it so that they can use it appropriately. There are some times that we have a little trouble getting logged in, dialed in, but we call [support] and she helps us and it works out. There's been great support for that."

Again, George C06 very eloquently laid out a vision of what might be. Although his response was far-reaching, his thoughts were a reflection of common themes expressed by the group in different terms:

> "So, wherever necessary you start small, you have a vision, you understand the critical steps to get from here to there, and you try your best to employ folks to come along with you to achieve that vision…But

> somebody has to have the vision. Someone has to be able to say: 'Where is this train going? And how will it get there?'
>
> And I feel like in some respects maybe I'm more of an engineer than a conductor on this train. But once it goes through the first five or six stations people say: 'Oh my, look at all the things you can do with that train…'
>
> I think one of my jobs is to "grow" somebody to eventually replace me, and that's always interesting. You want them to be smarter, more energetic, brighter, more committed. You have to look carefully. They don't have to be just like me, but the energy, the commitment, the dedication, the ability to see both the vision and the incremental steps to get from here to there… So, many folks if you give them a plan, they can affect the plan – They just follow down. But to say, 'Here's a blank sheet of paper. Come up with how would we go about solving this problem? What groups would we engage? What steps would we take? What money would we need?'…So, finding someone to eventually take this program to greater heights, of course. We want to eventually leave this position with the satisfaction that in glancing backward as well as forward…You glance back and you see a whole electronic superstructure in place…We all probably do that. But at the same time to be able to quickly look forward and see fertile ground out there for continued development and other ways to use the technology back and forth."

Summary of Findings

Chapter 4 provided a detailed overview of the analysis and results obtained through interviews with telehealth champions. Seven champion themes – *modern pioneers; champion teams; agents of change; knowledge brokers; supported by management; advocates, not champions;* and *well-prepared visionaries* – were explored. Telehealth champions are not born, but instead created. Applying the ideals of what it means to be a champion and how they overcome barriers to new telehealth applications could prove to be very beneficial for those tasked with developing new networks. As demonstrated through the analysis of themes, telehealth champions possess unique, as well as, shared

experiences that make them well prepared to face the uncertainty of the future and see their visions come to fruition. Going forward, the researcher will explore conclusions and recommendations aimed at improving the adoption, diffusion and sustainability of telehealth applications for the purpose of improved patient care and community health.

Chapter 5

Conclusions

Introduction

Building on the foundation of findings that were presented in Chapter 4, this chapter explores the following: interpretations of the thematic data; answers to the three overarching research questions; strengths, weakness and limitations of the study; implementations based on these findings; and recommendations for advancing the adoption and diffusion of telehealth applications through champion development. This chapter also explores the validity of the study and proposes recommendations for future research. The final section provides a brief summary of the research being presented.

Conclusions

When people think of the definition of a champion, they often picture the star of a sporting event, winner of a political contest or head of an organization that pursues a particular philanthropic purpose. Champions in the field of telehealth earn their designation not because they fit into existing social structures but because they are changing the way the practice of healthcare is conducted from *within* an existing social structure. They are also not experts in the traditional sense but instead are willing to create new areas of practice based on knowledge acquired specifically for use in applications that do not currently exist or have not reached maturation (Rogers, 2003).

The findings of this study lend credence to the idea put forward by Meyer et al. (2012) that telehealth champions can be the "X" factor that helps to overcome barriers to adoption, diffusion and sustainability within telehealth networks. This is especially important as standardization in technologies and processes occur. In fact, technology was

not a limiting factor in the experience of most participants. This may have been because their initial technical issues had been addressed, which resulted in the ability of telehealth applications to be successfully implemented. Non-champion sites might continue to experience technology issues, thus preventing their inclusion among the telehealth elite.

The experiences of telehealth champions are consistent with findings from Rogers' (2003) diffusion of innovation theory. While this theory is useful in exploring and predicting the way telehealth applications are adopted and diffused from an organizational standpoint, the framework focused on some areas that were not heavily cited by participants in this study as being a part of their experiences. These areas included telecompetence, provider resistance and trust (see Appendix I).

Instead, the themes derived from this interpretative phenomenological analysis show that champions are modern pioneers, members of teams, agents of change, brokers of knowledge, management-supported, earnest advocates and well-prepared visionaries. They are all of these things in spite of universal challenges and because of their own personal passions for telehealth.

The previously outlined findings from this study are used to answer three research questions:

1. What do telehealth champions believe to be the human elements necessary to advance telehealth systems?
2. How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?
3. How do these champions use shared processes and experiences to help spur engagement?

The findings and conclusions for each question are explored below. Themes are cross-referenced to demonstrate connectivity between the overarching study questions.

Research Questions

What do telehealth champions believe to be the human elements necessary to advance telehealth systems? Telehealth champions are modern pioneers who have been empowered to take on the responsibilities for telehealth activities as part of their current job duties. Because they serve as subject matter experts in the areas of clinical service, education or technical support, telehealth champions are able to translate new processes and technologies into the delivery of healthcare. Telehealth champions use their knowledge to seize opportunities for technology and capacity expansion (Singh et al., 2010). Regardless of how champions come to work as part of a telehealth network or their spoken perceptions about their roles, their participation goes beyond that of *just doing their jobs*. Repeatedly, telehealth champions, such as Nathan T05, spoke of the satisfaction they derived from the telehealth aspects of their job responsibilities.

Telehealth champions possess several common human elements. In addition to being pioneers who have personally taken on the challenges of telehealth as a problem to be solved or an opportunity to be seized, telehealth champions are team players. They serve as essential members of a multidisciplinary team working towards change through the active promotion of disruptive technologies (Christensen, 2013). More powerful than an individual agent of change, they should be viewed as a team of change agents. Telehealth champions are risk takers who advocate for solutions to problems that have existed for ages: access, inequity, geography and quality. Instead of asking "why," they are more likely to challenge the status quo and ask "why not"?

In addition to being supported by management to pursue the acquisition of knowledge and implementation of new processes, telehealth champions serve as advocates for change through the education of their leadership, colleagues and partners. They can be seen as aggregators of data and collectors of knowledge for technology and processes that currently exist and may one day exist. As George C06 summarized, telehealth champions are unique in their high levels of engagement and in their roles as knowledgeable professionals who are continually acquiring new information as lifelong learners.

The combination of these different human elements creates a specialized individual who is embodied by the term telehealth champion (see Figure 5.1). While the findings of the interview data do not reflect the counts or proportions of each element that is required to form a champion, the combination must include at least some of each element in order to offset the known barriers and challenges. Fortunately, telehealth champions bring their unique experiences and utilize their individual styles as part of their professional roles.

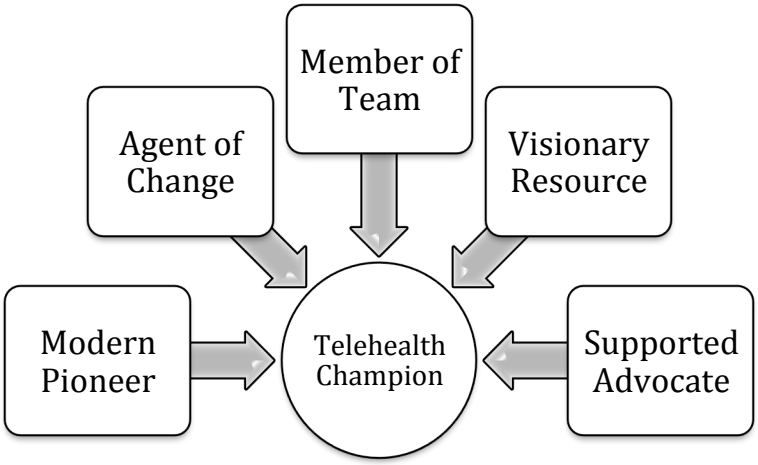


Figure 5.1. Human Elements in Combination to Form Telehealth Champion

How do these telehealth champions explain their empowerment during the creation and use of telehealth networks? As part of their current jobs or within the jobs that were created specifically to support telehealth applications, telehealth champions have been asked to make the applications work. As Ethan C01 stated, the roles and responsibilities associated with telehealth are not always a formal part of a champions' job description. Neither are any explicit benefits tied to the creation of new applications or advancement of services. Telehealth champions were most likely to report acknowledgment of their roles through the receipt of a pat on the back or the reporting of technical issues that require their attention.

Beyond the individual mandate, teams of individuals have been brought together and tasked with advancing telehealth applications within organizations. To the extent possible, these teams seem to function in a concerted effort across established departmental and organizational boundaries much like the research findings from multiprofessional teams in Finland (Vuononvirta et al., 2009). Knowledge sharing, technical coordination and process changes appear to be some of the main functions provided by champion teams. These teams also exist in informal ways across organizations through the development of workgroups tasked with addressing statewide telehealth challenges.

Individuals have taken it upon themselves to further their knowledge about products and services related to telehealth as described by Nathan T05. Often times, knowledge is gained through external partnerships with other healthcare organizations, vendors who specialize in telehealth equipment and services, or associations that focus on telehealth advocacy, education, industry and regulation. Internal knowledge gains are made

through collaborations with other telehealth providers within and across disciplines. The support provided by telehealth leaders at hub locations across the state was identified as being instrumental to the development of new telehealth applications (Meyer et al., 2012). This support had directly translated to good between partners and an extended sense of community.

The ownership for processes and successes within telehealth networks was especially important for champions as their inclination to take ownership helped processes move from adoption to diffusion. Not only did champions exhibit high levels of ownership tendencies, they also actively encouraged others involved in telehealth activities to take responsibility and serve as leads within their respective areas. Ownership was repeatedly cited as one way to speed adoption and smooth out issues arising from the use of disruptive technologies. Champions with managerial responsibilities actively sought team members who were willing to see telehealth as an opportunity that could be run with and integrated into the organizational culture. Previous studies have also shown that organizations interested in implementing telehealth applications are successful only when strong project management and leadership support are present (Joseph et al., 2011).

Without strong management support, mandates or leadership, telehealth champions would face greater barriers in their adoption, diffusion and sustainability efforts. Direct and indirect mandates to "make it work" were cited by champions across the three disciplines. Champions were especially proud when they were able to implement new technologies and processes that distinguished their organization and improved patient care. The support and involvement of management also helped to smooth integration of telehealth applications within existing services for healthcare and education. Integrated

systems were more likely to be sustained and were easier to justify for continued investment.

Coupled with managerial support, the natural inclination of telehealth champions appears to be active problem solvers, system improvers and common belief expanders. When given the freedom by management to experiment, telehealth champions naturally seem to push the envelope in a planned, coordinated and logical fashion. While it is true that they utilize disruptive technologies in order to achieve their goals, telehealth champions are very conscientious about not endangering the reputation of their organization, the care of any patients, or their ability to engage in future telehealth activities.

Champions currently seek additional support through the allotment of funds for existing and new telehealth applications, the expansion of services to additional geographic areas, the inclusion of additional clinical specialties, and the increased training of healthcare providers and patients. Empowerment through explicit support from leadership appears directly accelerate the current speed of adoption in the field of telehealth. Additionally, those champions charged with implementation welcome clear and bold leadership from those with the responsibility for providing vision and support (see Figure 5.2). Often, champions are the main go to resources as the keepers of technical, clinical and educational knowledge sharing through telehealth applications.

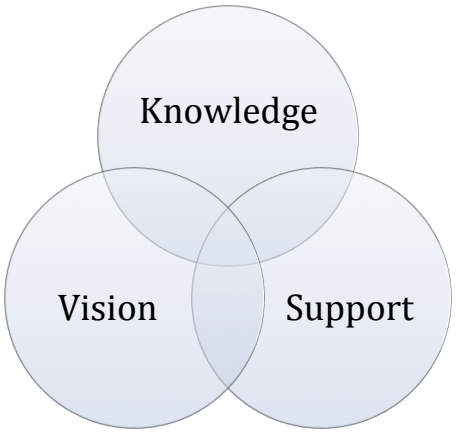


Figure 5.2. Ingredients for Telehealth Champions' Empowerment

How do these champions use shared processes and experiences to help spur engagement? Telehealth champions apply a wide range of acquired knowledge to the development of telehealth applications. They embark upon these processes as part of teams that are charged with everything from improving clinical care – to changing delivery mechanisms for education – to developing new technical infrastructures. As Clara C05 mentioned, the results are changing the possibilities for the delivery of patient care. Coupled with trained personnel, the newest home monitoring technologies allow providers and patients to engage in a more detailed plan for care based on the collection of real-time data and the analysis of a patient's clinical indicators (Browning, Tullai-McGuinness, Madigan, & Struk, 2009). Clinical specialists who can review and analyze data sent through these innovative applications and networks are being formed to serve in new healthcare teams. The cultivation of telehealth champions has the ability to improve healthcare results through the acquisition and sharing of knowledge (see Figure 5.3).

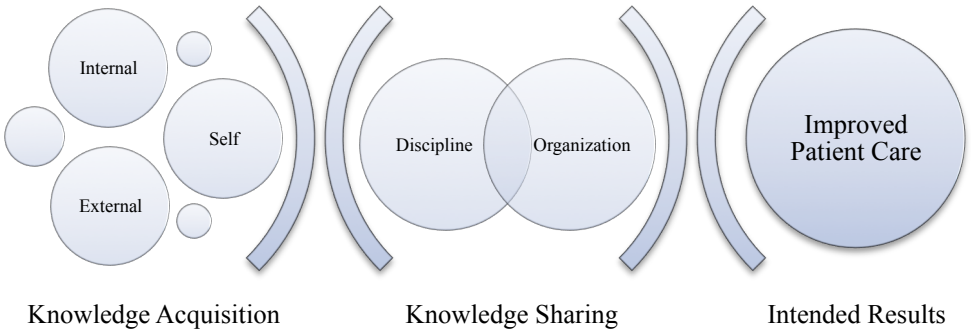


Figure 5.3. Intended Result of Shared Champion Experiences and Processes

In fact, the continuum of care for patients is so important that telehealth applications are changing the established procedures at individual healthcare organizations so that they better align the care of patients as they move through different facilities (Sarah E05). This potentially results in an increase in the speed of knowledge transfer between providers, the refinement of best practices based on data acquired through these new partnerships, and the opportunity to reduce medical costs through improved services (Standing et al., 2011). Also, the availability of education for healthcare providers has increased dramatically through telehealth activities. This also increases the speed at which scientific discoveries that are made within the clinical science research arena can be shared for use at the bedside within community healthcare organizations. Partnerships for research and quality improvement projects are expanded when providers at academic medical centers are connected with providers in community hospitals. The result is a two-way street of knowledge transfer and discovery.

Knowledge that is acquired through participation in national associations and statewide meetings can be put into immediate practice at the local level. Significant savings in time, energy and money can be derived from *not re-creating the telehealth*

wheel. Lessons learned and successful practices for changing regulation, legislation, and policy at the state and national levels are invaluable for resource-strapped healthcare organizations as described in a four-state case study by O'Toole Jr. et al. (2011). The benefit of utilizing data from other states can often be considered a positive application of hard-fought knowledge gains and policy precedents.

Data, obtained from internal, as well as, external partners can be used to show a return on investment for telehealth applications. Healthcare is an increasingly data-driven industry that relies on the collection, analysis and sharing of data to justify new and existing clinical services. Telehealth applications, while not exempt from the established protocol for the deployment of new clinical services, have experienced a grace period to date. Going forward, goodwill and good publicity alone will not serve as significant justification for the investment in telehealth applications. The high investment risks associated with telehealth are both barriers to adoption and diffusion (Jennett et al., 2005). As expected, telehealth champions are eager to engage the proper data gathering processes to help make their cases.

Along similar lines, the majority of telehealth champions reported leveraging existing systems to overlay new telehealth applications as a way of getting into the game. Where possible, organizations utilized federally subsidized broadband connections specifically designed to support healthcare applications. Benefits have been seen from industry partners who have been willing to provide demo units, customized systems, or scalable products that allow healthcare organizations to make small, incremental steps towards adoption. Still, issues surrounding the diffusion of technology and the sustainability of processes exist within each organization represented in this study.

Finally, telehealth champions are not immune to the fears inherent with disruptive technology. The way they have best demonstrated their acquisition of knowledge and ability to serve as leaders within their organizations has been as neutral parties who are self-educated, well-prepared, and in possession of a strong vision for how future telehealth applications are adopted. By "measuring twice and cutting once" as Davis T04 suggested, telehealth champions have proven to be measured in their embrace of new technologies, role models for adoption among their colleagues, and exemplars of innovation among their peers. This approach ensures that telehealth champions will continue to have a seat at the decision-making table.

Strengths, Weaknesses and Limitations

The sample size of this study could be considered a strength because of the number of participants representative of each champion role: clinical (6), educational (5) and technical (5). The perspective and experience of each champion was at once unique, but also shared. The researcher feels that the lived experiences of telehealth champions within South Carolina have been fully represented by the interview data collected, coded, analyzed and presented. This study examined the role of individuals within a system that was marginally standardized. Still, the ways in which each participant was selected or elected to become involved in telehealth created a diversity of experiences that covered all phases of adoption, diffusion and sustainability.

Also, this study is the first known research into the specific human components of the development of new telehealth environments. In the race to implement the best and newest technology, healthcare providers, educators and technical support staff should not be overlooked as key component in a healthy system that supports telehealth activities.

Echoing Meyer et al. (2012), the experiences of telehealth champions indicate that the human element is fundamental to the use of technology.

A weakness might be the singular nature of the researcher. Additional researchers working on this topic might form different understandings of the lived experiences of telehealth champions. At a minimum, they would provide additional perspectives in the coding and analysis of the interview data. This weakness can be seen as offset by the thorough review of transcript data by the participants and a narrative that utilizes complete selections of quotes to support the narrative through first-person accounts. Also, while the researcher engaged in an extensive bracketing and journaling protocol, it was impossible to separate ones own experiences from those with whom the researcher was investigating. This was even more of a challenge because the researcher had shared actual telehealth experiences with several of the study participants. Nevertheless, every precaution was taken to cull out the researcher's experiences and fully reflect understandings derived from participant experiences.

While it could be considered a limitation, the researcher does not consider the narrow focus of the geographic area from which the participants were drawn to be so. Fellow scholars may wonder if the findings and conclusions should be considered limited in generalizability to a state that is small and population and rural in nature. Upon considerable reflection by the researcher, the possibility of this as a significant limitation appears to be minor since this study focused more on universal human elements than technical processes and configurations specific to any one network or organization. The researcher encourages additional studies that examine the roles of telehealth champions in other settings.

Validity

Smith et al. (2009) recommend judging the validity of a study on four points that were previously defined by Yardley (2000). The four points explored by Smith et al. (2009, pp. 180–183) in relation to this study are detailed below.

1. The researcher is to have shown *sensitivity to context* throughout the entire research study. For this study, the researcher carefully considered the most appropriate participants, methodology and format, interview schedule, communication medium and reporting structure for the subject matter. The researcher intended to make a study participant as comfortable within the process and as properly represented in the final report as possible. Given the sensitive and personal nature of the experiences described by the telehealth champions, the researcher has reviewed all of the data to ensure proper contextualization and anonymous presentation.
2. In order to present a robust research study that contributes to the body of knowledge, the researcher displayed the highest level of *commitment and rigor* throughout this process. Attention was paid to every aspect of the study design and implementation to ensure a participant pool that was representative of the telehealth activities being conducted within the state. The sample size was diverse and proportionate. Data points were collected, revised and analyzed in a systematic way that can be replicated by other researchers. Transcripts were provided for all participants who wished to review their interviews. Only finalized transcripts from each

participant were included in the data. The final presentation of data includes the perspectives of all participants and is representative of the volume of data collected on each participant group. The researcher frequently journaled her thoughts and regularly engaged in reflective exercises to keep a pure perspective throughout the research process.

3. This study has been described with the utmost in *transparency and coherence*. No detail has been spared in the description of research, methodology, findings or conclusions. Significant amounts of supporting analysis and narrative help frame the research findings and conclusions. The researcher's intent was to present a coherent and cohesive picture of what makes a telehealth champion. To this end, data and analysis were presented from the first person accounts of the participants where appropriate and supported. All study methodology was conducted as originally proposed with any changes being documented (e.g. update to interview schedule).
4. The final principle of validity as outlined by Yardley is the aspiration of *impact and importance*. If presented properly, the reader should be able to discern important themes and conclusions from this study. While previous studies have focused on the use of specific technologies and process to address barriers and speed implementation of telehealth applications, this study is important for its examination of the human elements also necessary for adoption, diffusion and sustainability. Few studies have researched the role champions play in the development and deployment of

telehealth networks. As a result, the experiences of champions described herein are informative and enlightening. Time will tell the importance of this research, but it is hoped that the findings are translatable into positive applications for emerging telehealth networks.

Implications

The findings from this research study have multiple implications for healthcare administrators, practitioners, academicians and patients. There is no known published research specifically examining the lived experiences of telehealth champions. Findings from this study reveal multiple focal areas for future research and process development to better grow champions and champion teams. The stories shared by participants are rich with experiential data that show how barriers were overcome, the personal traits necessary for future leaders in the area of telehealth and the direction champions see technology going.

Behind all the technology, processes and systems, there are genuine champions who are deeply committed to improving access and care for patients. The terms and expressions used by participants when they described their passion for seeing telehealth applications succeed were inspiring. While healthcare professionals have a reputation for being altruistic and committed to helping people, telehealth was the best hope many saw for systemic change that would give more patients access to timely and quality healthcare. Telehealth champions are committed *to being the change they wish to see* in their communities.

Beyond the human element that is evident in telehealth champions, there are people standing behind them, providing vision, leadership, resources, support and advice. While

telehealth champions are pioneers, there are settlers standing by, ready to take up the cause. Widespread internal and external support appears to exist for the expansion of telehealth applications. This is consistent with the movement to increase healthcare access and patient support as described in research findings by Robinson, Turner, Levine, and Tian (2011). In their study, additional monitoring and behavioral counseling through increased communication between providers and patients was found to improve chronic disease management. These findings bode well for rural and underserved areas in that services might actually become more accessible and effective.

This concept of change through purposeful leadership is especially important in the realm of healthcare because of the complexities involved in simply maintaining the status quo; for champions to seek to implement change of this magnitude is a significant undertaking. Only time and hindsight will tell whether healthcare leaders are able to capitalize on these opportunities and demonstrate systemic change that positively affects the health of populations.

Recommendations

These findings can be used to help *grow* a new generation of telehealth champions. Changes can be made to incorporate the use of technology into health professions training courses and health information technology programs. The healthcare workforce needs to formalize the way telehealth processes and knowledge are shared to limit the duplication of efforts and delays in achieving *telecompetence* as described by Gattoni and Tenzek (2010). In the not too distant future, the possibility exists that telehealth will truly be a delivery mechanism for healthcare and not a separate service area. In order for

this level of diffusion and sustainability to be reached, more clinicians, educators and technicians need to be immersed and educated in telehealth environments.

First, organizations should review these findings and identify practitioners who fit the description of a telehealth champion. These practitioners should be given areas of responsibility and freedom where they can try new things and advance telehealth applications in a way that meets the business and cultural needs of the organization and community. Additional support should be provided to telehealth champions by management in the form of clear and actionable vision, financial support and realistic goals, and the human resources necessary to implement changes in practice. Telehealth is clearly an area where healthcare management should *lead, follow or get out of the way*. The telehealth champions who have carried the mantle thus far are well prepared to take the next steps relevant to their specific networks.

Second, training programs should take into account the human elements identified in this study as relevant when recruiting and training practitioners. The technology should remain only a tool in the healthcare delivery toolkit so that passionate, inquisitive and innovative people are positioned to lead networks and not just troubleshoot issues. Upfront training could reduce the number of barriers and help to prevent implementation and diffusion missteps (Browning et al., 2009). Telehealth champions are *thinkers* by nature and need to be exposed to knowledge in ways that encourage further exploration.

Third, education should not be relegated to the sideline in the development of telehealth networks. Only through strong training and education programs can an organization fully implement telehealth activities. Not only is there training for the use of technology, but there are also instructions on new clinical processes, advancements in

the practice of medicine, and demonstrations of how telehealth applications affect the provision of patient care. Entire training programs have been developed just to ensure proper communication between providers at different sites. This includes training for all personnel who will be interacting with patients, conducting exams, and developing patient care plans (Joseph et al., 2011). The room for improvement in the delivery of care facilitated by technology is monumental.

Fourth, organizations should proceed with the development telehealth networks only with the active and supportive involvement of their technology staff. Without strategic planning upfront regarding the development and deployment of new technologies on existing networks, the amount of retrofitting and customizing required can quickly sour the experience for all. Opportunities also exist to reduce the duplication of equipment and services, improve the quality of services, and extend services to new areas. These advances are possible mainly with a proper level of involvement by the technology staff. Technology personnel are often the most knowledgeable about how to make telehealth applications a reality.

Fifth, clinicians are equally essential to the development of telehealth networks. Not only are they often the subject matter experts, but they also have the ultimate responsibility for the quality of care that is provided through the technology. In addition, they have experience in overcoming systematic barriers that have created access issues for patients in the past. The stories that physicians tell about the impact they have on the lives of their patients can serve as some of the best arguments for the expanded use of telehealth applications. Only a glowing first person account from a patient could be more compelling to a legislative or regulatory body seeking examples of efficacy.

Sixth, in most cases, the efficacy of telehealth applications has been settled. Current barriers are centered on process and organizational culture issues. External barriers remain and include reimbursement for services, support through infrastructure required for high-quality broadband connectivity in all areas, and practice guidelines approved by state boards of medical examiners that allow for and encourage the use of telehealth activities to meet the needs of patients. Healthcare administrators, providers, leaders and patients should employ advocacy, *or championess*, to ensure that telehealth activities are permitted, reimbursed and properly regulated. Delays in regulatory or legislative authorization simply lead to confusion and missed opportunities to provide better healthcare.

Seventh, an additional area of inquiry emerged after reviewing the findings. Should champions be tapped or are they best when self-identified? Findings show that those with the passion to help affect organizational change should be tasked with implementation regardless of their current responsibilities. While it seems wise to use mainly internal human resources in the development of championship teams, management should be prepared to provide clear visions and guidelines for how telehealth activities are rolled out. If additional, specialized talents are needed, they should be carefully selected for integration into the existing team structure. Regardless of how champions come to be involved in telehealth, all need to be fully supported through explicit direction, vision and leadership.

Final recommendations include identifying areas where telehealth champions can be recognized for their contributions and formalizing the incentives or rewards provided to champions. Additional clarification of job duties, responsibilities and performance

measures would also be seen as helpful. Telehealth champions need mentorship and guidance as they create new areas of operations and take on previously unimagined responsibilities. They should be recognized for their value to organizations and used as the focal point for telehealth team development and expansion.

Future Research

Some areas for future research have already been explored in previous sections. Researchers have opportunities to further investigate the experiences of individuals tasked with telehealth activities within other environments. These professionals may not all be champions or team leaders, but the nature of telehealth requires a holistic approach to researching how some organizations succeed in overcoming barriers. Research should focus on what team dynamics mean for telehealth applications going forward and how teams can be formed for optimal results.

Opportunities also exist to use education as a tool for telehealth application development, adoption, diffusion and sustainability efforts. As such, research into the education and training needs for providers at all levels of deployment could yield valuable insights about the information required to successfully launch telehealth applications. When, where, how frequently and to what depth do clinicians, educators and technologists need to be exposed to telehealth trainings? Does content delivered at the point of care provide sufficient understanding or do providers simply need extensive preparatory courses before using telehealth applications? What is the continuing education need of providers, technologists and educators as they evolve in their roles?

Additional areas of inquiry could focus on future developments in telehealth. If the lived experiences of telehealth champions reflected in this research study have bearing on

others who are following in their footsteps, how was that knowledge applied and translated to overcome barriers? With the ubiquitous diffusion of telehealth applications, will the term telehealth champion still be relevant? What will remain as the essential human elements required for technological and process success?

Summary

This research study sought to understand the lived experiences of telehealth champions in the areas of clinical, educational and technical healthcare services. As telehealth applications are being more widely used to provide patient care and provider education (Zanaboni & Wootton, 2012), the human elements that directly impact the successful adoption, diffusion and sustainability of networks were noticeably absent in the literature.

The research literature identifies telehealth champions as important to the implementation of innovative applications, but does not address how they are able to overcome barriers and achieve higher levels of engagement. Gantenbein et al. (2011), specifically cite the need for research into the themes common to telehealth champions in the field of mental health. This research study further sought to advance the work of Singh et al. (2010) in identifying the personifications that allow telehealth champions to serve as agents of change and visionaries in the development of telehealth applications.

Three research questions were used to frame this study and understand the lived experiences of telehealth champions:

1. What do telehealth champions believe to be the human elements necessary to advance telehealth systems?

2. How do these telehealth champions explain their empowerment during the creation and use of telehealth networks?
3. How do these champions use shared processes and experiences to help spur engagement?

Telehealth applications continue to grow in importance as a way to address systemic issues such as healthcare access, quality and equity. Nevertheless, significant barriers remain in the adoption, diffusion and sustainability of applications. Barriers include complex technologies, professional roles and responsibilities, resources, leadership and vision, and lack of support through education. This research study was conducted to better understand the "gap between human knowledge and human activity" as described by Vuononvirta et al. (2009). The collaborative involvement of clinical, educational, and technical champions within the field of telehealth is seen as necessary to address the complex technical and process issues inherent throughout healthcare systems.

A review of the literature demonstrated a need for a better understanding of the following: how innovations are diffused within telehealth networks; how telehealth networks evolve and reach sustainability; how they are affected by change processes; what human elements are necessary; how education supports and expands technical capabilities; and what technological support is needed for clinical applications. Based on findings and recommendations from previous qualitative studies of telehealth, additional research into these areas was warranted.

Interpretative phenomenological analysis (IPA), as described by Smith et al. (2009), was used to understand and comprehend the lived experiences individual. The use of IPA to conduct this study was based on a review of the existing gaps and knowledge

surrounding telehealth champions. By examining these experiences in the context of champions groups, the researcher sought to form a thematic narrative that explains how telehealth champions overcame barriers and how they continue to advance applications. The researcher determined that this methodology would best lend itself to understanding the experiences of telehealth champions and how those experiences shape current and future activities.

Upon approval by the Institutional Review Boards at Nova Southeastern University and the Medical University of South Carolina, the researcher examined the experiences of 16 telehealth champions who were identified by telehealth leaders at academic medical centers in South Carolina. A total of six clinical, five educational and five technological champions participated in semi-structured interviews conducted via a statewide videoconferencing network. Videoconferences were conducted using a statewide network of high-speed broadband enabled applications utilizing the Palmetto State Providers Network (PSPN). Data were collected from each interview through recordings obtained as part of the videoconferences. Interviews were transcribed by a third-party transcriptionist, reviewed by the researcher, and signed-off on by each participant. Edits to the transcripts were made prior to being imported into the qualitative data analysis software, NVivo ("NVivo 10 research software for analysis and insight," n.d.). The researcher read and re-read the interview data as part of the established IPA method. The emergent themes were derived from coded and analyzed transcription data in order to find patterns across the cases that were representative of the lived experiences of each participant group. The researcher also engaged in considerable reflexive bracketing and

journaling of her prior experiences in order to create a firewall between prior and acquired knowledge.

The findings are based on a study sample that was demographically diverse and representative in terms of age, practice setting, role and gender. There were an equal number of males and females who were interviewed. Participants' ages ranged from 30 years to close to 80 years. Participant practice settings were also evenly distributed between rural, suburban and urban areas across the state.

The lived experiences of telehealth champions show seven overarching themes. These super-ordinate themes were derived from the analysis of data across participant groups and the systematic review of commonly coded nodes. A description of each follows:

1. *Modern Pioneers* – The majority of telehealth champions are self-described modern pioneers who are also *just doing their jobs*. Sub-ordinate themes include champions are: 1) comfortable with risk; 2) innovators who are not afraid of risk; and 3) involved in telehealth as part of their current jobs.
2. *Champion Teams* – Telehealth champions view their roles and successes mainly in the context of larger teams that are working towards common goals. Sub-ordinate themes demonstrate that there: 1) is no "I" in team; 2) exists the potential for new partnerships as part of individual efforts; and 3) individuals can benefit professionally from their personal growth and telehealth knowledge.
3. *Agents of Change* – All 16 telehealth champions embrace the use of "emergent disruptive technologies" to change inert systems and create new processes that improve access and patient care. Sub-ordinate themes explored include: 1) the pushing of existing boundaries; 2) changes in the care being provided; 3) barriers

that still need to be overcome; 4) changes in culture of practice; 5) ownership for success; and 6) the concept of building infrastructure in anticipation of usage.

4. *Knowledge Brokers* – Telehealth champions are both acquirers of knowledge and the givers of invaluable experiences that serve to inform others. Sub-ordinate themes demonstrate that champions: 1) build relationship to advance telehealth; 2) serve as role models; 3) borrow from others who have come before; 4) institute changes because of the needs related to the continuum of care between providers; and 5) engage in a great deal of preparation before commencing activities.
5. *Supported by Management* – The majority of telehealth champions see the support of management as essential to their professional development and the development of new telehealth activities. Sub-ordinate themes reflect the need to be supported by management through: 1) expectations that are more closely aligned; 2) visions that are clearly communicated; 3) financial resources; 4) recognition of ongoing budget issues and 5) the opportunity to leverage existing equipment and personnel to reach goals.
6. *Advocates, More Than Champions* – The term "champions" is not a comfortable title for most of the study participants as most view themselves more as advocates or simply members of a team. Sub-ordinate themes clarify the personification of the term champion to be viewed in a variety of ways, including advocates as: 1) bringing many positive attributes to the table; 2) always engaging in selfless actions; 3) owners of the processes; 4) actively choosing to utilize new approaches; and 5) being full of conviction that they are on the right path.

7. *Well-Prepared Visionaries* – Telehealth champions are constantly focused on improving their current processes in order to be prepared to take future steps in implementing what they see as an inevitable progression of technological capabilities. Sub-ordinate themes show champions to be: 1) persistent professionals; 2) agents of change; 3) planners who constantly think ahead; 4) realists who recognize the need for redundant systems in the case of failure; and 5) visionaries who are trying to determine how to best navigate challenges and opportunities.

In addressing the three original research questions, the lived experiences of telehealth champions provided the following insights with questions presented alongside a summary of findings:

What do telehealth champions believe to be the human elements necessary to advance telehealth systems? Telehealth champions are modern pioneers who function as part of innovative telehealth teams. They serve as agents of change who utilize their knowledge of disruptive technologies to advocate for improvement in established healthcare systems. Their passion, involvement, willingness to take risks and visionary tendencies make them invaluable.

How do these telehealth champions explain their empowerment during the creation and use of telehealth networks? Telehealth champions are *just doing their jobs* as they have evolved in scope and responsibility. They are tasked by their leadership to work across historical boundaries in the pursuit of a larger goal. Telehealth champions achieve substantial increases in their empowerment through the acquisition and sharing of knowledge specific to the development of new telehealth applications. Again, they

utilize the strength of teams and depend on the support of management to make telehealth processes work. Telehealth champions take ownership of applications and processes important to ensure adoption and diffusion. They are problem solvers who serve as resources for their colleagues, organizations and collaborative networks.

How do these champions use shared processes and experiences to help spur engagement? Telehealth champions apply a wide range of acquired knowledge to the development of telehealth applications. They were *grown* from a combination of activities based on knowledge acquisition and sharing. Telehealth champions channel the universal goals of improving patient care and expanding healthcare access to overcome adoption barriers. Existing and new infrastructure systems, clinical processes and educational offerings are utilized to provide connectivity. They collect and share data as a way of making the case for new services and justifying existing applications. Telehealth champions are essential resource and data aggregators within cross-discipline teams.

The findings of this study are generalizable to other practice settings and are important for the development of future telehealth networks. The researcher has engaged in established methods to limit the impact of researcher's bias or previous experience. Findings show a high level of validity based on the four areas of focus identified by Smith et al. (2009): sensitivity to context; commitment and rigor; transparency and coherence; and impact and importance.

Implications are based on an increased understanding of activities performed by telehealth champions and their career experiences. The research methodology and focus are unique in the literature and will hopefully advance what is known about successful

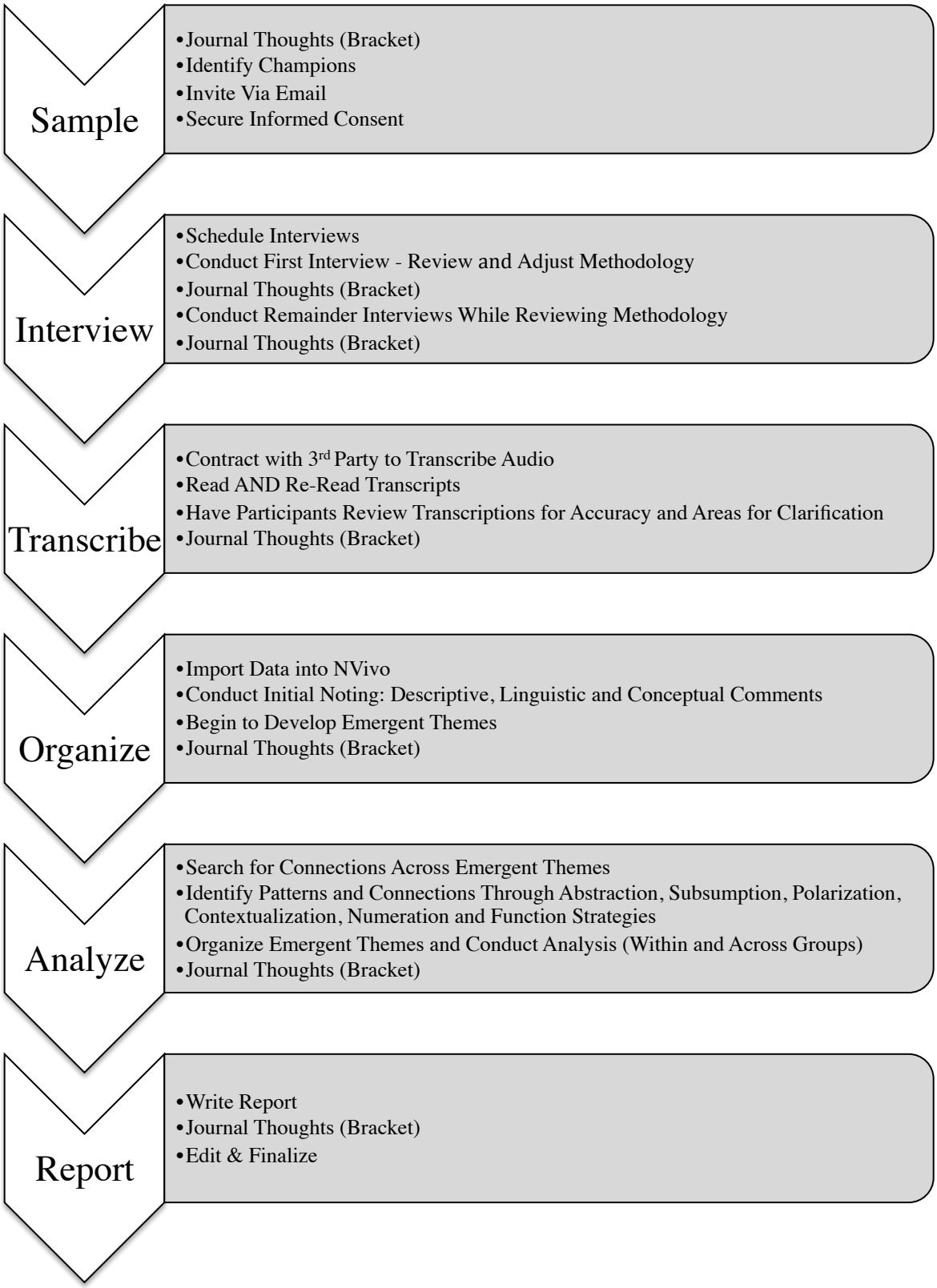
telehealth adoption, diffusion and sustainability. Because passionate telehealth champions exist across the clinical, educational and technical fields that support telehealth activity, by vocalizing their experiences, they have shown the importance of understanding the human resources that are involved with making technical systems work. Pioneers stand ready to throw open the doors of innovation and make changes in the delivery of healthcare possible.

Telehealth has been shown to have efficacy (Schwamm et al., 2009), but in order to grow new telehealth champions and networks, telehealth leaders need to provide clear vision, support, education and resources to overcome barriers and advance innovation. Individual telehealth champions should be viewed in the context of larger telehealth teams. The researcher recommends growing champions through focused efforts that take advantage of existing resources and plugging in new talents as needed. Partnership and team-based initiatives should be encouraged and supported. Champions should be given the freedom and tools needed to advance their missions of advocacy. They should be held to established and agreed upon performance measures and recognized for their contributions to organizational goals and improvements in population health.

Areas of future research include looking at the use of telehealth champion teams to overcome barriers. Education should be used as a structure research tool for empowering champions and affecting change. Based on the adoption and diffusion of telehealth networks going forward, additional research should examine the use of telecompetent teams to bypass barriers and continue to refine our understanding of the human elements necessary for success.

Appendixes

Appendix A: Research Processes Conducted Following IRB Approval



Appendix B

Letter of Invitation to Study Participants

Dear _____,

I am a doctoral candidate at Nova Southeastern University working on a dissertation focusing on the lived experiences of telehealth champions. In addition, I am also the Director of Learning Services for the South Carolina Area Health Education Consortium based at the Medical University of South Carolina. The goal of this project is to acquire a better understanding of how telehealth champions help with the adoption and diffusion of telehealth applications.

Although previous research has examined how telehealth networks are deployed and sustained, research has not examined the people who help to make these initiatives successful. I am specifically interested in interviewing people who have helped to establish, grow and maintain telehealth networks within the state of South Carolina. Because your peers have recognized you as a champion in a field of telehealth (clinical, education or technology), I am interested in learning more about how you became involved in telehealth and helped to make it a successful application for your organization. In this interview, I am interested in hearing about your experiences with telehealth applications, technologies, innovations, processes and outcomes.

Each interview will take place via a videoconferencing session and will be audio and video-recorded. Study participants will remain completely anonymous. The interview is expected to last approximately 90 to120 minutes. Should you be interested, the results from this research will be shared with you.

If you are willing to participate in this project, please email me at duboser@musc.edu or rd734@nova.edu so I can answer any questions you have. Upon your acceptance of this invitation, we will schedule the interview to be held during a videoconferencing session at or near your location. Please note that the location will need to be in an area that can facilitate a private dialogue.

Should you have any questions, please contact me at 843-324-0080 or either of the two e-mail addresses above. I look forward to your participation in this study.

Best wishes,

Ragan A. DuBose-Morris, MA

Appendix C

NOVA SOUTHEASTERN UNIVERSITY
Graduate School of Computer and Information Sciences

Consent Form for Participation in the Research Study Entitled

An Interpretative Phenomenological Analysis of Telehealth Champions

Funding Source: None

IRB Protocol #: **05011301Exp**

Principal investigator
Ragan A. DuBose-Morris, MA
814 Trent Street
Charleston, SC 29414
33314 (843) 324-0080

Co-investigator
Laurie Dringus, Ph.D.
3301 College Avenue
Fort Lauderdale, FL
(954) 262-2073

For questions/concerns about your research rights, contact:
Human Research Oversight Board (Institutional Review Board or IRB)
Nova Southeastern University
(954) 262-5369/Toll Free: 866-499-0790
IRB@nsu.nova.edu

Site Information
Medical University of South Carolina
19 Hagood Avenue, Suite 802, MSC 814
Charleston, SC 29425

What is the study about?
You are invited to participate in a research study. The goal of this study is to better understand the lived experiences of telehealth champions. This study is designed to help researchers collect information that will assist in the adoption and diffusion of telehealth applications.

Why are you asking me?
We are inviting you to participate because you are recognized as a champion in the field of telehealth (clinical, educational or technical) within South Carolina. There will be between 15 and 20 participants in this research study.

What will I be doing if I agree to be in the study?
The principal investigator, Mrs. DuBose-Morris, will interview you. Mrs. DuBose-Morris will ask your experiences establishing, maintaining and growing telehealth applications within your organization. The interview will be conducted using videoconferencing technology and will last no more than 120 minutes. A follow-up interview may be necessary and, with your consent, would last no more than 30 minutes.

Initials: _____ **Date:** _____ **Page 1 of 3**

Is there any audio or video recording?
This research project will include an audio and video recording of the interview. The audio recording will be available to be heard by the researcher, Mrs. Ragan DuBose-Morris, the university's Institutional Review Board, and the dissertation chair, Dr. Laurie Dringus. The audio recording will be transcribed by a professional transcription service using a secure file upload service. The video recording will be available to be viewed by the researcher, Mrs. Ragan DuBose-Morris, the university's Institutional Review Board, and the dissertation chair, Dr. Laurie Dringus. The video recordings will only be used to ensure the correct interpretation of the audio transcription. The researcher will review the transcribed audio in conjunction with the video recording to help ensure that your words are transcribed in the correct context. The video recording will not be utilized as part of the data reporting. All recordings will be kept securely on Mrs. DuBose-Morris' secure server to which only she and system administrators have access. All recordings will be kept for 36 months from the end of the study and the recordings will be destroyed after that time by erasing the electronic files. Because your voice and image will be potentially identifiable by anyone who hears the audio recording or views the video recording, your confidentiality for things you say or do on the recordings cannot be guaranteed although the researcher will try to limit access to the files as described in this paragraph.

What are the dangers to me?
Risks to you are minimal, meaning they are not thought to be greater than other risks you experience everyday. Being recorded means that confidentiality cannot be promised, but every precaution will be made to ensure the confidentiality of the research data throughout the collection, storage, analysis, and reporting stages. Interviews will be scheduled at your convenience with after-hours slots available. The privacy of the interview will be established through the use of private virtual meeting rooms and the display of signage indicating a videoconference is in session. If you have questions about the research or your research rights, please contact Ms. DuBose-Morris at (843) 324-0080. You may also contact the IRB at the numbers indicated above with questions about your research rights.

Are there any benefits to me for taking part in this research study?
Although there are no direct benefits to you for participating, it is hoped that the study will ultimately benefit others charged with the implementation of telehealth applications and the communities in which they serve.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you or payments made for participating in this study.

How will you keep my information private?
All information obtained in this study is strictly confidential unless disclosure is required by law. The transcripts of the interviews will not have any information that could be linked to you. All transcribed data from the interview will be available to be read by the researchers, the university's Institutional Review Board, and Dr. Laurie Dringus. As mentioned, the interview files will be destroyed 36 months after the study ends. The IRB, regulatory agencies, or involved faculty members may review research records.

What if I do not want to participate or I want to leave the study?
You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the conclusion of the study and may be used as a part of the research.

Other Considerations:
If the researchers learn anything, which might change your mind about being involved, you will be told of this information.

Voluntary Consent by Participant:
By signing below, you indicate that:

- This study has been explained to you
- You have read this document or it has been read to you
- Your questions about this research study have been answered
- You have been told that you may ask the researchers any study related questions in the future or contact them in the event of a research-related injury
- You have been told that you may ask Institutional Review Board (IRB) personnel questions about your study rights
- You are entitled to a copy of this form after you have read and signed it
- You voluntarily agree to participate in the study entitled *An Interpretative Phenomenological Analysis of Telehealth Champions*

Participant's Signature: _____ Date: _____

Participant's Name: _____ Date: _____

Witness's Signature: _____ Date: _____

Signature of Person Obtaining Consent: _____

Date: _____

Initials: _____ Date: _____ Page 3 of 3

Appendix D

Final Interview Schedule

An Interpretative Phenomenological Analysis of Telehealth Champions

Setting and Participant Data
Participant Group (Clinician, Educator, Technologist):
Gender:
Date & Time of Interview:
Participant Code:
Contact Information:

Greetings and Introductions

- Do you have any questions concerning the informed consent form or study protocol?

- If you have no other questions, would it be okay for us to start the interview?

Please note that this conversation is being recorded. After this interview is transcribed, I will send you a copy of the transcripts for your review. Please review to ensure their accuracy. If there is anything you would like to add or change please let me know in an email and I will add it to the bottom of the transcript. Please return the transcript ASAP.

- Would you like to have a copy of the results of this study?

General Interview Questions*
As a definition, telehealth applications pertain to the use of technology to facilitate clinical encounters, deliver medical education, conduct research or transmit healthcare information.

- Please describe your experiences as a telehealth champion.

- How did you come to work with a telehealth application?

- What were the barriers that you had to overcome to make your telehealth application successful?

    - How did you adjust to or work around those barriers?

- What barriers do you face with policy, regulations or legislation?
    - How did you adjust to or work around those barriers?
- What problems do you currently face with the telehealth technology?
- What types of improvements in the technology would help you in delivering care over the telehealth network?
- Do you receive any incentives as part of your employment to facilitate telehealth activities?
- What kinds of support do you receive from your colleagues and/or administration?
- How have you personally helped to advance telehealth?
- What types of processes or knowledge did you gain from others in telehealth that you then applied in your organization?
- How do you see your role with telehealth changing in the coming years?
- Do you intend to continue utilizing or supporting telehealth activities?

Group Specific Interview Questions: Clinician (C), Educator (E), Technologist (T)

- As a C/E/T, what issues do you see with the widespread adoption of telehealth applications?
- As an educator, how do telehealth applications influence your care of patients?
- As a clinician, how do telehealth applications influence your care of patients?

- As a technologist, how do you support telehealth applications?

- What are the personal traits required to make telehealth successful?

- How does it feel to have been identified as a telehealth champion?

- Do you have any recommendations to those who are starting a telehealth network (lessons learned)?

Interviewer Notes:

*Adapted from Demiris, Edison, and Schopp (2004) & Kennedy (2013)

Appendix E

Transcript Review Letter

Dear _____:

Thank you again for your participation in the study entitled, "An Interpretative Phenomenological Analysis of Telehealth Champions." I sincerely appreciate your willingness to share your experiences and opinions related to telehealth.

As previously indicated, your interview was recorded and has now been transcribed by a professional transcriptionist. Please follow this **link** to review your completed transcription through Google Drive. Besides me as the researcher, you are the only person who has access to this file.

At this point in the study, your assistance is requested to review the transcription and make any additions or changes at the bottom of the document under the section, "Participant Review & Feedback." I invite you to elaborate on the transcribed conversation or share any additional thoughts that might have arisen since our interview. Please provide your comments directly onto the Google Drive file and save your changes by _____(date). After you complete your changes, I will receive a notification from Google Drive. The file will then be saved offline.

If you have any questions about this process, the transcript or the future steps for this study, please do not hesitate to contact me directly at duboser@musc.edu or rd734@nova.edu. You can also reach me by phone at 843-324-0080.

Best wishes,

Ragan DuBose-Morris, Ed.S., M.A.

Appendix F

IRB Approval Letter – Nova Southeastern University

NOVA SOUTHEASTERN UNIVERSITY

MEMORANDUM

To: Ragan A. DuBose-Morris, MA
Graduate School of Computer and Information Sciences

From: David Thomas, M.D., J.D. CO For DT
Chair, Institutional Review Board

Date: June 3, 2013

Re: *An Interpretative Phenomenological Analysis of Telehealth Champions*
Research Protocol No. 05011301Exp.

I have reviewed the revisions to the above-referenced research protocol by an expedited procedure. On behalf of the Institutional Review Board of Nova Southeastern University, *An Interpretative Phenomenological Analysis of Telehealth Champions* is approved in keeping with expedited review categories #6 and #7. Your study is approved on **June 3, 2013**and is approved until **June 2, 2014**. You are required to submit for continuing review by **May 2, 2014**. As principal investigator, you must adhere to the following requirements:

1) CONSENT: You must use the stamped (dated consent forms) attached when consenting subjects. The consent forms must indicate the approval and its date. The forms must be administered in such a manner that they are clearly understood by the subjects. The subjects must be given a copy of the signed consent document, and a copy must be placed with the subjects' confidential chart/file.

2) ADVERSE EVENTS/UNANTICIPATED PROBLEMS: The principal investigator is required to notify the IRB chair of any adverse reactions that may develop as a result of this study. Approval may be withdrawn if the problem is serious.

3) AMENDMENTS: Any changes in the study (e.g., procedures, consent forms, investigators, etc.) must be approved by the IRB prior to implementation.

4) CONTINUING REVIEWS: A continuing review (progress report) must be submitted by the continuing review date noted above. Please see the IRB web site for continuing review information.

5) FINAL REPORT: You are required to notify the IRB Office within 30 days of the conclusion of the research that the study has ended via the IRB Closing Report form.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Dr. Ling Wang
Dr. Laurie Dringus
Ms. Jennifer Dillon

Institutional Review Board
3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-5369 • Fax: (954) 262-3977 • Email: irb@nsu.nova.edu • Web site: www.nova.edu/irb

Appendix G

IRB Approval Letter – Medical University of South Carolina

Institutional Review Board for Human Research (IRB)
Office of Research Integrity (ORI)
Medical University of South Carolina

Harborview Office Tower
19 Hagood Ave., Suite 601, MSC857
Charleston, SC 29425-8570
Federal Wide Assurance # 1888

APPROVAL:
This is to certify that the research proposal **Pro00026339** entitled:
An Interpretative Phenomenological Analysis of Telehealth Champions

and submitted by: **Mrs. Ragan DuBose-Morris**
Department: **AHEC - MUSC**

For consideration has been reviewed by **IRB-II - Medical University of South Carolina** and approved with respect to the study of human subjects as adequately protecting the rights and welfare of the individuals involved, employing adequately methods of securing informed consent from these individuals and not involving undue risk in the light of potential benefits to be derived therefrom. Additionally, the Institutional Review Board for Human Research (IRB) recommends approval of the investigator's request for Waiver of Consent pursuant to 45 CFR 46.116(d) because the research involves no more than minimal risk to the subject, the waiver will not adversely affect the rights and welfare of the subjects, and the research could not be practicably carried out without the waiver. No IRB member who has a conflicting interest was involved in the review or approval of this study, except to provide information as requested by the IRB.

Original Approval Date: **7/31/2013**
Approval Expiration: **7/30/2014**

Type: **Expedited**

Chairman, **IRB-II - Medical University of South Carolina**
Susan Sonne*

Statement of Principal Investigator:

As previously signed and certified, I understand that approval of this research involving human subjects is contingent upon my agreement:

1. To report to the Institutional Review Board for Human Research (IRB) any adverse events or research related injuries which might occur in relation to the human research. I have read and will comply with IRB reporting requirements for adverse events.
2. To submit in writing for prior IRB approval any alterations to the plan of human research.
3. To submit timely continuing review reports of this research as requested by the IRB.
4. To maintain copies of all pertinent information related to the research activities in this project, including copies of informed consent agreements obtained from all participants.
5. To notify the IRB immediately upon the termination of this project, and/or the departure of the principal investigator from this Institution and the project.

∗ ***Electronic Signature****: This document has been electronically signed by the IRB Chairman through the HSSC eIRB Submission System authorizing IRB approval for this study as described in this letter.*

Appendix H

Node Classifications

Name	Sources	References
Barriers	**16**	**89**
Adoption Issues	16	43
Overcome	16	46
Championess	**16**	**231**
Applied Knowledge	14	24
Background	16	37
Incentives	14	23
Involvement	15	34
Passion	12	24
Personification	15	65
Resources	8	18
Trust	5	6
Clinical Care	**15**	**147**
Access	12	33
Cultural Change	11	36
Outcomes	5	7
Partnerships	6	15
Quality Improvement	13	33
Standards of Care	10	23
Education Initiative	**11**	**103**
Education	10	63
Meeting Patient Care Needs	6	6
Staff Support	6	21
Student Support	2	4
Telehealth Support	7	9
Future	**15**	**91**
Challenges	11	22
Innovations	13	46
Positive	8	11
Vision	7	12
Organization and Process Issues	**16**	**87**
Legislative Issues	7	11
Management Support	14	38
Policy Issues	12	24
Regulation	9	13
Technology	**16**	**94**
Equipment Issues	12	32

Improvements	10	19
Process Issues	10	18
Scheduling and Room Issues	3	5
Support Issues	6	12
User Issues	4	8

Appendix I

Node Counts by Practice Setting (Sorted by Rural Participants)

	Practice Setting = Rural	Practice Setting = Suburban	Practice Setting = Urban
Education	**30**	23	4
Personification	23	12	30
Barriers	18	**24**	**42**
Innovations	14	9	23
Policy Issues	12	4	8
Incentives	11	6	5
Challenges	11	4	7
Adoption Issues	10	15	17
Applied Knowledge	10	5	9
Background	10	8	19
Involvement	10	9	15
Standards of Care	10	6	6
Management Support	10	15	11
Access	9	9	15
Cultural Change	9	6	21
Overcome	8	11	27
Quality Improvement	8	10	15
Passion	7	5	12
Vision	7	1	4
Equipment Issues	7	10	15
Improvements	7	7	5
Process Issues	7	6	5
Partnerships	6	1	8
Staff Support	6	13	2
Legislative Issues	6	1	4
Support Issues	6	4	2
Positive	5	4	2
Regulation	5	1	7
Outcomes	3	1	3
Meeting Patient Care Needs	3	2	1
Telehealth Support	3	4	2
User Issues	3	4	0
Resources	2	5	11
Trust	2	0	4
Student Support	2	0	2
Scheduling and Room Issues	0	4	1

Appendix J

Sample Coding and Annotation

Loretta E01

[06:57]
Interviewee: As far as advancing it, I think we've been working pretty hard to try and get the information in respect of the nursing staff here as far as what we have available, especially things that we have available online, live courses and via the video conferencing equipment. Just because for us in this small area it's very difficult with staffing and everything else for the staff to be going far distances. It's also difficult with our budget to allow that. So, we've really been pushing the issue of getting the staff to come to use the video conferencing equipment and online as far as getting their education.

So, they are able to get what they need within a decent price range. They don't have to drive far, making it more convenient. We just need to find out from them what their needs are and try to have that information available.[1]

[Coded: Education Initiative – Education; Education Initiative – Staff Support]

[07:54]
Interviewer: So, how did you personally come to work with a telehealth application?

[07:59]
Interviewee: My background… I've been nursing for about 25, 26 years. Within the past 12 years I have worked 7 years in information systems; I have worked as a nursing supervisor; I currently still work PRN as a rehab nurse and also as a site nurse; and now I'm finally working in an educational position, but my role has always been in education of some form. I just like the idea of knowing that we've done something that's going to advance the knowledge of the nurses so they're better prepared, because right now with all their responsibilities it's kind of hard for them to really focus on a lot of things.[2]

[Coded: Championess – Background; Education Initiative – Staff Support]

Annotations
[1] Serving as a champion for those who are not aware of the resources.
[2] Healthcare background is part of her evolution - essential for translating practices to next generation of nurses.

References

About Palmetto State Providers Network. (n.d.). Retrieved February 05, 2012, from http://pspnsc.org/aboutpspn/

Ahern, K. J. (1999). Ten Tips for Reflexive Bracketing. *Qualitative Health Research*, *9*(3), 407–411. doi:10.1177/104973239900900309

André, B., Inger Ringdal, G., Loge, J. H., Rannestad, T., Laerum, H., & Kaasa, S. (2008). Experiences with the implementation of computerized tools in health care units: A review article. *International Journal of Human-Computer Interaction*, *24*(8), 753–775. doi:10.1080/10447310802205768

Bachmann, L., Cantoni, L., Coyne, J., Mazzola, L., & McLaughlin, E. (2010). Are we ready for a CME eLearning Readiness Index (eCMERI)? A map and a literature review. In *Third International Conference on Human System Interaction* (pp. 513–519). IEEE. doi:10.1109/HSI.2010.5514521

Bennett, A. M., Rappaport, W. H., Skinner, F. L., & National Center for Health Services Research & Mitre Corporation. (1978). *Telehealth handbook: A guide to telecommunications technology for rural health care* (p. 153). Hyattsville, MD. Retrieved from http://md1.csa.com/partners/viewrecord.php?requester=gs&collection=TRD&recid=N7926778AH&q=+telehealth&uid=792139567&setcookie=yes

Bloomberg, L. D., & Volpe, M. (2008). *Completing your qualitative dissertation: A road map from beginning to end* (p. 344). Thousand Oaks, Calif.: SAGE Publications, Inc. Retrieved from http://books.google.com/books?hl=en&lr=&id=4nroVq2gmx8C&pgis=1

Breen, G.-M., & Matusitz, J. (2010). An evolutionary examination of telemedicine: A health and computer-mediated communication perspective. *Social Work in Public Health*, *25*(1), 59–71. doi:10.1080/19371910902911206

Brooks, E., Manson, S. M., Bair, B., Dailey, N., & Shore, J. H. (2011). The diffusion of telehealth in rural American Indian communities: A retrospective survey of key stakeholders. *Telemedicine and e-Health*, *18*(1), 60–6. doi:10.1089/tmj.2011.0076

Browning, S. V., Tullai-McGuinness, S., Madigan, E., & Struk, C. (2009). Telehealth: Is Your Staff Ready To Implement? A descriptive exploratory study of readiness for this technology in home health care. *Home Health Nurse*, *27*(4), 242–248.

Bulley, C., Shiels, J., Wilkie, K., & Salisbury, L. (2010). Carer experiences of life after stroke - a qualitative analysis. *Disability and Rehabilitation*, *32*(17), 1406–13. doi:10.3109/09638280903531238

Carel, H. (2011). Phenomenology and its application in medicine. *Theoretical Medicine and Bioethics*, *32*(1), 33–46. doi:10.1007/s11017-010-9161-x

Carter, L. M., Muir, L., & McLean, D. (2010). Narrative as a means of understanding the multi-dimensional benefits of telehealth: An exploration of telehealth stories. *Canadian Journal of University Continuing Education*, *37*(1). Retrieved from https://ejournals.library.ualberta.ca/index.php/cjuce-rcepu/article/view/10474

Casebeer, L., Brown, J., Roepke, N., Grimes, C., Henson, B., Palmore, R., Granstaff, U.S., & Salinas, G. (2010). Evidence-based choices of physicians: A comparative analysis of physicians participating in Internet CME and non-participants. *BMC Medical Education*, *10*, 42. doi:10.1186/1472-6920-10-42

Cho, S., Mathiassen, L., & Gallivan, M. (2009). Crossing the diffusion chasm: From invention to penetration of a telehealth innovation. *Information Technology & People*, *22*(4), 351–366. doi:10.1108/09593840911002450

Christensen, C. M. (2013). Disruptive Innovation. In M. Soegaard & R. F. Dam (Eds.), *The Encyclopedia of Human-Computer Interaction* (2nd ed.). Aarhus, Denmark. Retrieved from http://www.interaction-design.org/encyclopedia/disruptive_innovation.html

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions* (2nd ed.). Thousand Oaks, Calif.: Sage Publications.

Curran, V. R., Fleet, L., & Kirby, F. (2006). Factors influencing rural health care professionals' access to continuing professional education. *The Australian Journal of Rural Health*, *14*(2), 51–5. doi:10.1111/j.1440-1584.2006.00763.x

Curran, V. R., Rourke, L., & Snow, P. (2010). A framework for enhancing continuing medical education for rural physicians: A summary of the literature. *Medical Teacher*, *32*(11), e501–8. doi:10.3109/0142159X.2010.519065

DeBakey, M. E. (1995). Telemedicine has now come of age. *Telemedicine Journal*, *1*(1), 3–4. doi:10.1089/tmj.1.1995.1.3

Demiris, G., Charness, N., Krupinski, E., Ben-arieh, D., Washington, K., Wu, J., & Farberow, B. (2011). The role of human factors in telehealth. *Telemedicine and e-Health*, *16*(4), 446–453. doi:10.1089/tmj.2009.0114

Demiris, G., Edison, K., & Schopp, L. H. (2004). Shaping the future: Needs and expectations of telehealth professionals. *Telemedicine Journal and e-Health*, *10*(supplement 2), S60–S63. doi:10.1089/tmj.2004.10.S-60

Dexter, P. R., Miller, D. K., Clark, D. O., Weiner, M., Harris, L. E., Livin, L., Shaw, D., Blue, L.A., Kunzer, J., & Overhage, J. M. (2010). Preparing for an aging population and improving chronic disease management. *AMIA 2010 Symposium Proceedings*, *2010*, 162–6. Retrieved from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3041380&tool=pmcentrez&rendertype=abstract

http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3041380&tool=pmcentrez&rendertype=abstract

Dolezal, L. (2009). The remote body: The phenomenology of telepresence and re-embodiment. *Human Technology*, *5*(2), 208–226. Retrieved from http://www.humantechnology.jyu.fi/articles/volume5/2009/dolezal.pdf

Gagnon, M.-P., Desmartis, M., Labrecque, M., Car, J., Pagliari, C., Pluye, P., Frémont, P., Gagnon, J., Tremblay, N., & Légaré, F. (2012). Systematic review of factors influencing the adoption of information and communication technologies by healthcare professionals. *Journal of Medical Systems*, *36*(1), 241–77. doi:10.1007/s10916-010-9473-4

Gammon, D., Johannessen, L. K., Sørensen, T., Wynn, R., & Whitten, P. (2008). An Overview and Analysis of Theories Employed in Telemedicine Studies. *Methods of Information in Medicine*, (47), 260–269. doi:10.3414/ME0484

Gantenbein, R. E., Robinson, B. J., Wolverton, R. L., & Earls, J. (2011). Developing telehealth in rural America: The Wyoming Network for Telehealth. In *2011 IEEE Global Humanitarian Technology Conference* (pp. 386–390). doi:http://doi.ieeecomputersociety.org/10.1109/GHTC.2011.42

Gattoni, A., & Tenzek, K. E. (2010). The practice: An analysis of the factors influencing the training of health care participants through innovative technology. *Communication Education*, *59*(3), 263–273. doi:10.1080/03634521003605808

Glassmeyer, D. M., & Dibbs, R.-A. (2012). Researching from a distance: Using live web conferencing to mediate data collection. *International Journal of Qualitative Methods*, *11*(3), 292–302.

Gonzalez-Espada, W. J., Hall-Barrow, J., Hall, R. W., Burke, B. L., Smith, C. E., & González-Espada, W. J. W. (2009). Achieving success connecting academic and practicing clinicians through telemedicine. *Pediatrics*, *123*(3), e476–83. doi:10.1542/peds.2008-2193

Gray, K., & Sim, J. (2011). Factors in the development of clinical informatics competence in early career health sciences professionals in Australia: A qualitative study. *Advances in health sciences education: Theory and practice*, *16*(1), 31–46. doi:10.1007/s10459-010-9238-3

Haans, A., & IJsselsteijn, W. (2012). Embodiment and telepresence: Toward a comprehensive theoretical framework. *Interacting with Computers*, *24*(4), 211–218. doi:10.1016/j.intcom.2012.04.010

Hassija, C., & Gray, M. J. (2011). The effectiveness and feasibility of videoconferencing technology to provide evidence-based treatment to rural domestic violence and sexual assault populations. *Telemedicine and e-Health*, *17*(4), 309–15. doi:10.1089/tmj.2010.0147

Jennett, P., Jackson, A., Ho, K., Healy, T., Kazanjian, A., Woollard, R., Haydt, S., & Bates, J. (2005). The essence of telehealth readiness in rural communities: An organizational perspective. *Telemedicine Journal and e-Health*, *11*(2), 137–45. doi:10.1089/tmj.2005.11.137

Joseph, V., West, R. M., Shickle, D., Keen, J., & Clamp, S. (2011). Key challenges in the development and implementation of telehealth projects. *Journal of Telemedicine and Telecare*, *17*(2), 71–7. doi:10.1258/jtt.2010.100315

Kennedy, D. H. (2013). *An investigation of candidates' experience of attrition in a limited-residency doctoral program*. Nova Southeastern University.

Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the craft of qualitative research interviewing* (2nd ed., p. 376). SAGE Publications, Inc.

Légaré, E., Vincent, C., Lehoux, P., Anderson, D., Kairy, D., Gagnon, M.-P., & Jennett, P. (2010). Telehealth readiness assessment tools. *Journal of Telemedicine and Telecare*, *16*(3), 107–9. doi:10.1258/jtt.2009.009004

Leventhal, T., Taliaferro, J. P., Wong, K., Hughes, C., & Mun, S. (2012). The patient-centered medical home and health information technology. *Telemedicine Journal and e-Health*, *18*(2), 145–9. doi:10.1089/tmj.2011.0130

Maarop, N., & Win, K. T. (2012). Understanding the need of health care providers for teleconsultation and technological attributes in relation to the acceptance of teleconsultation in Malaysia: A mixed methods study. *Journal of Medical Systems*, *36*(5), 2881–92. doi:10.1007/s10916-011-9766-2

Maheu, M., Whitten, P., & Allen, A. (2002). *E-Health, telehealth, and telemedicine: A guide to startup and success* (p. 400). John Wiley & Sons.

Marchesoni, M. A., Lindberg, I., & Axelsson, K. (2012). Staff expectations on implementing new electronic applications in a changing organization. *The Health Care Manager*, *31*(3), 208–20. doi:10.1097/HCM.0b013e3182619d73

Mazmanian, P. E., & Davis, D. A. (2002). Continuing medical education and the physician as a Learner: Guide to the evidence. *Journal of the American Medical Association*, *288*(9), 1057–1060.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. Education for Health* (p. 94). Washington, D.C. Retrieved from http://eprints.cpkn.ca/7/

Meyer, B. C., Clarke, C. A., Troke, T. M., & Friedman, L. S. (2012). Essential telemedicine elements (tele-ments) for connecting the academic health center and remote community providers to enhance patient care. *Academic Medicine*, *87*(8), 1032–40. doi:10.1097/ACM.0b013e31825cdd3a

Moore, G. (2004). Darwin and the demon: Innovation within established enterprises. *Harvard Business Review*, 86–92.

Moore, M. (1999). The evolution of telemedicine. *Future Generation Computer Systems*, *15*(2), 245–254. doi:10.1016/S0167-739X(98)00067-3

Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning* (3rd ed., p. 361). Belmont, CA: Cengage Learning.

Munhall, P. L., & Chenail, R. J. (2008). *Qualitative Research Proposals and Reports: A Guide* (3rd ed., p. 100). Jones & Bartlett Publishers, Inc. Retrieved from http://books.google.com/books?id=-3dq0iaadSgC&pgis=1

Murray, E., Burns, J., May, C., Finch, T., O'Donnell, C., Wallace, P., & Mair, F. (2011). Why is it difficult to implement e-health initiatives? A qualitative study. *Implementation Science*, *6*(1), 6. doi:10.1186/1748-5908-6-6

Murtuza, S., & Bakshi, H. (2012). Healthcare information technology service assessment: A healthcare leader prospective. *International Journal of Advanced Research in Computer Engineering & Technology*, *1*(4), 410–418.

NVivo 10 research software for analysis and insight. (n.d.). Retrieved February 20, 2013, from http://www.qsrinternational.com/products_nvivo.aspx

O'Toole Jr., L. J., Slade, C. P., Brewer, G. A., & Gase, L. N. (2011). Barriers and Facilitators to Implementing Primary Stroke Center Policy in the United States: Results From 4 Case Study States. *American Journal of Public Health*, *101*(3), 561–566. doi:10.2105/AJPH.2010.197954

Palmetto State Providers Network - IT Frequently Asked Questions. (n.d.). Retrieved February 05, 2012, from http://pspnsc.org/it-questions/

Palmetto State Providers Network Frequently Asked Questions. (n.d.). Retrieved February 05, 2012, from http://pspnsc.org/general-questions/

Poston, III, W. R. (n.d.). Palmetto State Providers Network Summary.

Robin, B. R., McNeil, S. G., Cook, D. A., Agarwal, K. L., & Singhal, G. R. (2011). Preparing for the changing role of instructional technologies in medical education. *Academic Medicine*, *86*(4), 435–9. doi:10.1097/ACM.0b013e31820dbee4

Robinson, J. D., Turner, J. W., Levine, B., & Tian, Y. (2011). Expanding the walls of the health care encounter: support and outcomes for patients online. *Health Communication*, *26*(2), 125–34. doi:10.1080/10410236.2010.541990

Rodrigo, C., Delgado, J. L., Vega, J., Covadonga Rodrigo, Jose Luis Delgado, & Jorge Vega. (2010). Using Interactive Videoconference to Promote Active Learning in a Blended Learning Environment. In *2010 10th IEEE International Conference on Advanced Learning Technologies* (pp. 658–662). Sousse, Tunisia: IEEE. doi:10.1109/ICALT.2010.187

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed., p. 512). New York, NY: Free Press.

Schleyer, T. K., Thyvalikakath, T. P., Spallek, H., Dziabiak, M. P., & Johnson, L. (2012). From information technology to informatics: The information revolution in dental education. *Journal of Dental Education*, *76*(1), 142–53. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22262557

Schwamm, L. H., Audebert, H. J., Amarenco, P., Chumbler, N. R., Frankel, M. R., George, M. G., Gorelick, P., Horton, K., Kaste, M., Lackland, D., Levine, S., Meyer, B., Meyers, P., Patterson, V., Stranne, S., & White, C. J. (2009). Recommendations for the implementation of telemedicine within stroke systems of care: A policy statement from the American Heart Association. *Stroke*, *40*(7), 2635–60. doi:10.1161/STROKEAHA.109.192361

Secondlife.com. (2012). Retrieved January 10, 2012, from http://secondlife.com/

Sedgwick, M., Alberta, L., & Spiers, J. (2009). The Use of videoconferencing as a medium for the qualitative interview. *International Journal of Qualitative Methods*, *8*(1), 1–11. Retrieved from http://ejournals.library.ualberta.ca/index.php/IJQM/article/viewArticle/1826

Singh, R., Mathiassen, L., Stachura, M. E., & Astapova, E. V. (2010). Sustainable rural telehealth innovation: A public health case study. *Health Services Research*, *45*(4), 985–1004. doi:10.1111/j.1475-6773.2010.01116.x

Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. *Health Psychology Review*, *5*(1), 9–27. doi:10.1080/17437199.2010.510659

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research* (p. 232). SAGE Publications Limited. Retrieved from http://books.google.com/books?id=WZ2Dqb42exQC&pgis=1

South Carolina Area Health Education Consortium - SCHOOLS. (2012). Retrieved November 04, 2012, from http://scahec.net/schools/

Spallek, H., O'Donnell, J., Clayton, M., Anderson, P., Krueger, A., & O'Donnell, J. (2010). Paradigm shift or annoying distraction–emerging implications of Web 2.0 for clinical practice. *Applied Clinical Informatics*, *1*(2), 96–115. doi:10.4338/ACI-2010-01-CR-0003

Standing, C., Volpe, I., Standing, S., & Gururajan, R. (2011). Making the most of virtual expertise in telemedicine and telehealth environments. *2011 IEEE Ninth International Conference on Dependable, Autonomic and Secure Computing*, 1010–1016. doi:10.1109/DASC.2011.166

Thapa, D. (2011). The role of ICT actors and networks in development: The case study of a wireless project in Nepal. *The Electronic Journal of Information Systems in Developing Countries*, *49*, 1–16.

Tosone, C. (2013). Virtual intimacy in the therapeutic space: Help or hinderance? In E. Ruderman & C. Tosone (Eds.), *Contemporary Clinical Practice* (pp. 41–49). New York, NY: Springer New York. doi:10.1007/978-1-4614-4124-3

Vivilaki, V., & Johnson, M. (2008). Research philosophy and Socrates: Rediscovering the birth of phenomenology. *Nurse Researcher*, *16*(1), 84–92. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=2010220194&site=ehost-live

Vuononvirta, T., Timonen, M., Keinänen-Kiukaanniemi, S., Timonen, O., Ylitalo, K., Kanste, O., & Taanila, A. (2009). The attitudes of multiprofessional teams to telehealth adoption in northern Finland health centres. *Journal of Telemedicine and Telecare*, *15*(6), 290–296. doi:10.1258/jtt.2009.090108

Vuononvirta, T., Timonen, M., Keinänen-Kiukaanniemi, S., Timonen, O., Ylitalo, K., Kanste, O., & Taanila, A. (2011). The compatibility of telehealth with health-care delivery. *Journal of Telemedicine and Telecare*, *17*(4), 190–4. doi:10.1258/jtt.2010.100502

Webber, S. (2013). Blended information behaviour in Second Life. *Journal of Information Science*, *39*(1), 85–100. doi:10.1177/0165551512469777

Whitten, P., & Holtz, B. (2008). Provider utilization of telemedicine: The elephant in the room. *Telemedicine and e-Health*, *14*(9), 995–7. doi:10.1089/tmj.2008.0126

Yardley, L. (2000). Dilemmas in qualitative health research. *Psychology and Health*, *15*, 215–228.

Zanaboni, P., & Lettieri, E. (2011). Institutionalizing telemedicine applications: The challenge of legitimizing decision-making. *Journal of Medical Internet Research*, *13*(3), e72. doi:10.2196/jmir.1669

Zanaboni, P., & Wootton, R. (2012). Adoption of telemedicine: From pilot stage to routine delivery. *BMC Medical Informatics and Decision Making*, *12*, 1. doi:10.1186/1472-6947-12-1

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