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Readiness of Stakeholders to Adopt Community Paramedicine Programs in Tennessee

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Walden University
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Abstract

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Roger L. Ritchie

MPA, Bellevue University, 2011

BS, Columbia Southern University, 2010

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration-Health Policy

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Abstract

Community paramedicine is an emerging model of care that promulgates EMS in a more community-based and integrated role within the broader health care system. A hallmark characteristic of community paramedicine is that programs are designed to meet the specific needs of a given community, rendering programs unique but perplexing. A need for research aimed at exploring possible barriers that may impede the adoption and implementation of community paramedicine programs has been identified by the National EMS Advisory Board, the North Central EMS Institute, and the Joint Committee on Rural Emergency Care. The purpose of this study was to explore opinions, attitudes, and beliefs among key policy makers regarding the adoption of community paramedicine programs in Tennessee. Rogers' diffusion of innovations was the theoretical framework for this qualitative case study, and a single overarching research question was used to solicit opinions among participants. Qualitative data were collected through semistructured interviews from 21 participants, including 13 EMS directors or other officials, physicians, county mayors, and home health representatives. The data corpus was coded to identify emerging themes, and both inductive and deductive processes were used in analysis. Findings emphasized various perceived attributes, but also indicated a lack in understanding of program definitions and parameters. Recommendations include further research on how programs may affect other health care providers, especially in rural settings. Implications for social change include providing a better understanding of community paramedicine and how future programs may best benefit patients in both rural and urban areas.

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Dedication

Foremost, this dissertation is dedicated to my loving wife, Amanda, who has been by my side every step of the way through this lengthy process. At times it seemed hopeless, but she encouraged me to never give up. She has been a pillar of strength and my reason for pushing forward. She continues to make each day brighter than the day before, and without her unrelenting support, the completion of this dissertation would not have been possible. She has enriched my life in every way, and I cannot thank her enough.

This dissertation is also dedicated to my late brother, Jerry, who completed his graduate degree at the University of Kentucky, only to pass away several weeks prior to commencement. His memory inspires me, and his unending commitment to finish his degree despite terminal illness, remains a story worth sharing. Rest assured, his steadfastness is celebrated today, as it will be tomorrow and forever in my memory.

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Chapter 1: Introduction to the Study

Introduction

The concepts of community paramedicine, often referred to as *mobile integrated healthcare* and collectively known as *mobile integrated healthcare/community paramedicine*, have gained much recognition within the emergency medical services (EMS) community over the past several years. The original conception was introduced in the National Highway Traffic Safety Administration's (NHTSA) 1996 publication *EMS Agenda for the Future*. Although the agenda predicted this new, more advanced practitioner would be commonplace by 2009, more than 20 years after the original publication, only a limited number of programs exist nationally, and programs remain forthcoming in the state of Tennessee (NHTSA, 1996).

The modern vision of community paramedicine continues to focus on how EMS will function within the broader healthcare system, and with the passing of the Patient Protection and Affordable Health Care Act of 2010 (PPACA) and changes in Medicare and Medicaid reimbursement laws THAT penalize hospitals for patient readmissions within 30 days of discharge, this new type of prehospital practitioner is now more appealing than ever (Tan, 2013). A target objective of community paramedicine is to manage chronic diseases such as diabetes, congestive heart failure, and chronic obstructive pulmonary disease in the patient's home rather than transporting to local hospital emergency departments (EDs). In addition to treating chronically ill patients at home, community paramedicine also aims at managing other low-acuity patients without hospital transport through a wider range of disposition options for certain high-

prevalence users, which often includes members of marginalized groups such as people who are mentally ill and people who are homeless. Such diversions would not only reduce hospital ED overcrowding, but could also generate annual Medicare and Medicaid savings of up to $560 million (Alpert, Morganti, Margolis, Wasserman, & Kellerman, 2014).

The existing quantity-based payment system provides little incentive for healthcare providers to promote individual health, but rather encourages the assiduous billing of medical procedures as if they were common commodities. EMS has traditionally operated under a similar quantity-based system, with the wares being the service of medical transportation. In other words, no transport, no pay. One new advantage brought forth by the PPACA realigns EMS as a healthcare benefit among most payers and not just a transportation benefit (Zavadsky & Hooten, 2016). This new alignment allows EMS to bill for medical services provided and is not contingent on the mere transportation of patients from one point to another. The new design poses significant opportunity for positive social implications for many aging, chronically ill, disabled, or otherwise marginalized populations, as it allows EMS to capitalize on its inherent presence within the community and to expand its role to better serve the population's needs.

Community paramedicine programs also align with PPACA mandates, as well as the concepts of value-based purchasing and the Triple Aim Initiative sponsored by the Institute for Healthcare Improvement (IHI). The Triple Aim Initiative was designed to optimize performance within the healthcare system and consists of the following three

components: (a) improving patient's overall experiences, (b) improving the health of the population, and (c) reducing per capita costs. This new patient-centered payment model is designed to be outcome based and focuses on the patients' overall satisfaction throughout the continuum of care, which frequently begins with EMS responding to the initial 911 call.

However, despite the projected value of community paramedicine services and heightened publicity over the past several years, programs have been scarcely adopted and slow to diffuse nationally when compared to other types of programs and technologies. Among the recent and ongoing efforts at healthcare reform, EMS appears perfectly aligned to adopt this new role within an emerging and integrated system of healthcare delivery. Seven of the eight states bordering Tennessee have, to some degree, adopted community paramedicine programs within their respective states (Zavadsky et al., 2015). However, Tennessee EMS leaders just began consideration of developing a statewide community paramedic program in June 2014, and efforts since have moved slowly through the legislative process. Therefore, further research is needed to explore the likelihood of adoption and to examine possible barriers that may preclude the adoption and implementation of community paramedicine programs in Tennessee.

Amid an aging population, physician and allied healthcare personnel shortages, hospital ED overcrowding, and an overall fiscally broken and fragmented healthcare system, exists a fervor for reform, and the outright potential for social implication appears as vast as it does necessary, with a gateway opportunity for EMS to fill large gaps in the future delivery of healthcare. Within this new paradigm of care, EMS

personnel will evoke the long-forgotten spirit of the physician house call, delivering one-on-one personalized care provided in the patient's home, as well as poised to advance the innovative technologies of telemedicine by functioning as liaison, electronically linking patient to physician, and providing the real-time eyes and ears to awaiting online medical personnel.

This chapter will provide a basic background and history of community paramedicine, subsequently introducing several successful programs around the country and highlighting specific political barriers. The need for individual community assessment is introduced through the national Community Paramedicine Evaluation Tool and an update as to where Tennessee EMS and political leaders currently stand in the process of creating Tennessee community paramedicine programs.

Background

In October 2012, the North Central EMS Institute, along with the Joint Committee on Rural Emergency Care, held a national conference in Atlanta, Georgia, with the purpose of developing the National Agenda for Community Paramedicine Research. It was determined that for community paramedicine programs to qualify for reimbursement, they would need to demonstrate a potential to render a significant impact on the overall healthcare system (Patterson & Skillman, 2012). Top research questions aligned with IHI's Triple Aim objectives and focused broadly on four target outcomes: (a) effectiveness, (b) value, (c) safety, and (d) access. Specific considerations evaluated included program development, new technology, workforce considerations, medical

oversight, and system impacts, among several other categories, in an effort to identify research needs and parameters.

Foremost, possible barriers to conducting community paramedicine research were identified, primarily concluding that EMS lacks an efficient research infrastructure and a lack of research expertise among practitioners (Patterson & Skillman, 2012). Also identified was a lack of public awareness toward community paramedicine concepts and potential value, as well as a lack of respect from other healthcare providers and stakeholders. In addition, and perhaps most vital, a lack of data and information systems capable of producing quantitative research results concerning interventions, patient tracking, costs, and outcomes, as well as missing and inconsistent data from the National EMS Information System (NEMSIS), and a lack of access to systems protected under the Health Insurance Portability and Accountability Act (HIPAA). Such topics will be discussed at greater length in Chapter 2.

Although community paramedicine remains a relatively new exemplar within the field of EMS, some notable research has surfaced recently. A small number of peer-reviewed articles exist, as well as a growing number of trade magazine articles, devoted to the subject. Among the emerging literature are some dissertations and master's thesis projects that include various types of research involving existing community paramedicine programs. For example, one study was a quantitative retrospective study to determine 30-day hospital readmission rates and related costs for congestive heart failure patients enrolled in the MedStar Mobile Healthcare Readmission Avoidance Program in Fort Worth, Texas (Hostettler, 2016).

MedStar is a leading example of urban-based community paramedicine and began their Congestive Heart Failure Readmission Prevention Program in 2010. The program offered home evaluations provided by community paramedics specifically trained to provide care for congestive heart failure patients. The program focuses on educating the patient and the patient's family or caregivers and oversees the patient's diet and weight, medication compliance, and lifestyle choices (MedStar Mobile Healthcare, n.d.). In addition, the program also teaches patients how to better manage their chronic diseases and when they should call 911 versus scheduling a visit with their primary care physician. The protocol also allows for medication adjustments and, in some cases, the administration of IV diuretics, all in efforts to prevent unnecessary trips to the emergency room (ER; MedStar Mobile Healthcare, n.d.). MedStar also provides a high utilizer 9-1-1/frequent user program, which will be discussed in Chapter 2.

In another study, researchers compared outcomes for access and referrals within two community paramedicine programs in North Carolina. As with the Hostettler effort, unnecessary ER visits were at the heart of problems identified, and one which the study referred to as a phenomenon (the overuse of ERs) contributing to rapidly escalating healthcare costs and poor access to primary care (Krumperman, 2013). The study compared two pilot projects, an evaluate, treat, and refer (ETR) program in Orange County, North Carolina, and a telephone triage and refer (TTR) program in Mecklenburg County, North Carolina. Details of the study will be discussed further in Chapter 2.

In other efforts, Kennedy (2011) conducted a study that focused on identifying gaps in service, existing barriers, and future challenges of selected community

paramedicine programs in Canada. Goldberg (2014) offered a topical analysis focused on new PPACA and Centers for Medicaid and Medicare Services (CMS) mandates, specifically hospital readmission rates as they applied to high-risk patients and explored ways EMS might bridge existing gaps through community paramedicine programs. Finally, Robertson (2015) set out to determine if patient transport to destinations other than hospital EDs could be a safe and cost-effective alternative.

The National EMS Advisory Council adopted its final advisory on community paramedicine on December 4, 2014. In the document, researchers explored the details, applications, and consequences of PPACA mandates as they pertain to the field of EMS. Included was a problem statement that identifies several factors that may impede success:

- Lack of understanding specifics of PPACA;

- Lack of national education standards and scope of practice;

- Inadequate training;

- Involvement of necessary medical direction; and

- Lack of ability to record healthcare visits.

The committee concluded, in part, that prior studies and existing community paramedicine pilot programs suggest that using paramedics in a preventive role can reduce healthcare costs and that EMS is a vital resource positioned to deliver alternative methods of patient care (Beck et al., 2012).

Internal publications, such as the aforementioned NHTSA's Emergency Medical Services Agenda for the Future, published in 1996, and subsequent efforts—*Education Agenda for the Future* published in 2000 and *EMS Workforce for the 21st Century*: *A*

National Assessment published in 2008, and the National Rural Health Association's

Rural and Frontier Emergency Medical Services Agenda for the Future published in

2004—are major position papers in the EMS field. Each address, in one form or another,

the concepts leading to modern community paramedicine programs, and each calls for

additional research to pursue new approaches and opportunities so that EMS can best

serve the public.

At the local level, the subject of community paramedicine was first introduced at

the Tennessee Board of Emergency Medical Services on June 30, 2014, where the state

EMS director, Donna Tidwell, introduced both a task force and a focus group committed

to oversight and development of community paramedicine programs and educational

curriculum in Tennessee. Tidwell (2014) also identified possible barriers, including

medical oversight, community involvement, and reimbursement concerns. In addition, a

needs assessment packet was distributed among committee members, which provided

statistics from each EMS region in the state and a link to the HRSA's paramedicine

evaluation tool. Other concerns were voiced regarding stakeholder acceptance from

primary care physicians, hospitals, hospice, and the EMS community (Tidwell, 2014).

One month later, in July 2014, new state legislature went into effect allowing

EMS to provide non-emergency patient care in Tennessee, which was not new to EMS.

However, the framing of SB2029/HB1807 opened the door for reform in the state and

drew a clear distinction between community paramedicine and home healthcare (Briggs

& Zachary, 2016). Although the services provided by community paramedics and those

performed by home health agencies appear similar in the management of chronic disease,

the Tennessee Ambulance Service Association drafted and lobbied the new legislation to expand and define the circumstances which EMS providers may use their skills

One of the gaps in research identified by the National EMS Advisory Council in their *Final Advisory on Community Paramedicine* publication in 2014, which was proffered as a recommendation, was a need to identify existing barriers to innovation and adoption of community paramedicine programs (Beck et al., 2012). While broad-based challenges, such as reimbursement, regulatory and workforce challenges, were identified by the National Conference of State Legislators in a 2010 publication, many specific barriers have yet to be considered, such as if local communities, EMS agencies, and government officials will view community paramedicine programs as a valuable alternative to existing methods and the long-standing status quo, especially without a secure path to reimbursement or other focusing event that would influence key players within the policy system (Weber, 2014).

Therefore, more research is needed to determine the readiness and willingness of key decision makers in the state of Tennessee, who are directly involved in what Rogers (2003) referred to as the *knowledge* and *persuasion* stages of the innovation-decision process, as leaders may be reluctant to change, especially considering the field of EMS has not previously experienced a paradigm shift of this magnitude. Further lending to skepticism are the many uncertainties surrounding community paramedicine development and future implementation, such as educational and workforce issues, acceptance of stakeholders, possible conflicts with other healthcare fields such as home health providers, impeding state and federal legislation, and the lack of established recognition

and reimbursement pathways among Medicare, Medicaid, and private insurance companies. In addition, other unknown conditions and circumstances may exist that may preclude the adoption and innovation of community paramedicine programs in Tennessee.

Problem Statement

Recent healthcare reform levied by the PPACA and CMS has promulgated a widespread requisite for change within the healthcare industry in the United States. EMS agencies have traditionally operated in the frontline trenches of healthcare and, by design, have provided emergency care for acute medical conditions and traumatic injuries. However, since inception, EMS has witnessed changes—such as the induction of Enhanced 9-1-1 and the Emergency Medical Treatment and Active Labor Act (EMTALA) of 1986—as well as a growing shortage of primary care physicians, and all have contributed to an increased public dependency on EMS services (Zavadsky & Hooten, 2016). In short, EMS and local hospital EDs have become the public safety net, with EMS agencies transporting more than 21 million patients per year to hospital EDs, and between 14% and 17% of all ED visits are for non-urgent care deemed best suited for treatment in an alternate setting (Patterson & Skillman, 2012).

EMS is currently at a crossroads that will require deliberate and concise planning to secure itself as an integral component of the future healthcare delivery system in the United States. In response to the call for reform, and as a matter of future sustainability, EMS as an industry must foster necessary changes (Zavadsky & Hooten, 2016). Community paramedicine programs proffer opportunities to fill gaps in several key areas.

Typically, existing models can be categorized as being either primary care or patient

navigation in nature, each representing a unique prospect to either expand the availability

of primary care services, such as in rural areas or to marginalized populations, or to

relegate the misuse of the E-9-1-1 system and hospital ED overcrowding, all the while

channeling patients to appropriate care facilities (Zavadsky & Hooten, 2016). While

successful programs do exist, it is uncertain if community paramedicine programs will

continue to be adopted and diffused across the country and specifically in Tennessee, in

lieu of a forthcoming focusing event or a significant state of relative advantage

warranting widespread and collective change (Rogers, 2003).

Researchers and other stakeholders have posed an array of concerns from

different viewpoints. From a legal perspective, Wolfberg (2015) spoke of stakeholder

buy-in and questioned if communities and elected officials would accept the repurposing

of EMS resources and the cultural shift in paradigm required for sustainability. The

National Agenda for Community Paramedicine Research identified a need for further

research to determine support from collaborators, such as insurance companies,

healthcare partners, and community stakeholders (Patterson & Skillman, 2012).

Others claim more research is needed to evaluate the impact of community

paramedicine programs on overall health outcomes as well as economic impact (Drennan,

2014), and the National EMS Advisory Council requested further research to identify

barriers to innovation and adoption of community paramedicine programs (Beck et al.,

2012). Due to the relative novelty of community paramedicine concepts and limited

application to date, many gaps in research exist. This study focused on the willingness

and readiness of policy decision makers to adopt community paramedicine programs in Tennessee considering the current and projected relative advantage of potential outcomes.

Purpose of the Study

The purpose of this qualitative case study was to explore the willingness and readiness of key policy decision makers to adopt community paramedicine programs in Tennessee. In the study, I focused on exploring precluding factors such as existing opinions and political positions among leaders, both rural and urban, as well as other influences that might impede the adoption and diffusion of community paramedicine programs within the designated social system.

Research Question

RQ: What are the opinions, attitudes, and beliefs among key policy makers regarding the adoption and diffusion of community paramedicine programs in Tennessee?

Theoretical Framework

Amid a recognized and inherent lack of research support and subsequent dearth of available data exists little tested theory in the field of EMS (Patterson & Skillman, 2012). The purpose of this study was to explore the willingness and readiness of key policy decision makers to adopt community paramedicine programs in Tennessee, and the study required a theoretical framework that would facilitate inquiry into how and why decisions are made in a specific social system. A leading theory of this sort extends from the Rogers' (1962) theory of diffusion and innovations, initially grounded in rural sociology

and affiliated most notably with the study of hybrid corn seed use among Iowa farmers (Rogers, 2003).

Rogers's theory of diffusion of innovations served as the foundational theory for this study. While the theory has been used to study many different types of innovations, from corn seed to communications, Rogers (2003) defined innovation as any concept, practice, or object that is new to the unit of adoption. Because community paramedicine represents a shift in paradigm and because program adoption has been sluggish despite an apparent need, it would befit researchers and the industry to understand factors precluding the acceptance of community paramedicine programs.

Rogers (2003) recognized five distinct characteristics of the innovation process. Foremost of these considerations is *relative advantage*, which is the degree to which the innovation is believed to be better than the existing technology, idea, or system it replaces. Another characteristic, *compatibility*, is the degree to which the innovation aligns with core existing values. *Complexity*, *trialability*, and *observability* represent the sum of the five characteristics, and when applied to community paramedicine in Tennessee, each bequeaths uncertainty at best and warrants the consideration of supplementary research.

Rogers (2003) referred to the progression of innovation as the *innovation-decision process*, that involves five chronological steps: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation. Holistically, EMS agencies in Tennessee remain in the knowledge and persuasion stages; the knowledge stage is where attitudes toward an innovation are still being formed. Due to the significance of the

persuasion stage, a wide range of both internal and external factors must be considered. Therefore, several models were used to frame the study in efforts to retain focus. One such model, which extends from the theory's base and is particularly suited for the study of new government programs, is the internal detriments model, which posits factors subject to internal political and economic influences (Sabatier, 1999). However, Monge and Contractor (2003) suggested that when looking at the adoption of new innovations, multiple theoretical frameworks are needed to best understand the complex process and strengthen the study through theory triangulation (Patton, 2014).

Other theories considered were Fishbein and Ajzen's theory of reasoned action (2004) and Ken Wilber's integral theory, or AQAL, which examines all quadrants at all levels. Community paramedicine, along with being aligned with the Triple Aim objectives, shares certain elements with the socioecological model and the social determinants model, which were also considered to aide merging the study with current research in the broader field of public health. In addition, The U.S. Department of Health and Human Services (DHHS), Health Resources and Services Administration's Community Paramedicine Evaluation Tool was considered to establish benchmarks and to gauge the overall readiness of EMS agencies to adopt and implement programs. Ultimately, theory triangulation was not used and the assessment tool, being vastly unfamiliar to participants, was not used.

Nature of the Study

The nature of the study was a qualitative case study focused on the willingness and readiness of decision makers to adopt community paramedicine programs in

Tennessee. The study was bounded by the preliminary process of the community

paramedic program initiatives as events unfolded in Tennessee. The study was also

bounded geographically by the eight EMS districts in the state and conducted among

certain opinion leaders, change agents, and key decision makers possessing the authority

to impose influence within the specific social system. The study was set in the

sociological orientation, contextually situated within the physical setting with an

exploratory design, collective and multi-sited, with an intrinsic approach toward data

analysis, to include the use of multiple strategies, such as content analysis, discourse

analysis, and relational analysis.

The case explored the predisposition of Tennessee EMS and local government

leaders to adopt community paramedicine programs and if any perceived factors

threatened to preclude such adoption. While mandates extending from PPACA and CMS

initiatives have created an urgency for healthcare reform across the allied health industry,

the concepts of community paramedicine represent a significant shift in paradigm from

the traditional roles of EMS. Due to the nature and extent of the necessary change

involved, a reluctance or resistance to the adoption of community paramedicine programs

can be speculated among organizations and political systems deeply rooted in the status

quo. Therefore, if not mandated by law, and in lieu of a confirmed pathway to

reimbursement, key decision makers across the state may be hesitant to adopt programs.

A closer look at the attitudes, opinions, and political alignment of key decision makers

was required to best understand the nature and extent of impeding factors.

In the study, I employed the use of purposeful sampling with goals of achieving adequacy through a confirmed saturation of the data and a level of appropriateness deemed necessary to meet theoretical needs (Rudestam & Newton, 2001). Specific strategies of purposeful sampling were used to facilitate a focused selection that sought to include at least one sample from each of the eight state EMS regions. However, only seven of the eight regions were represented in the study. The logical generalization afforded by critical case sampling allowed for maximum application of the data (Patton, 2014). In addition, aspects of opportunistic sampling were used to ensure inclusion of rural, suburban, and urban participants, and provided the ability to follow new leads as they arose. Interviews were conducted among key decision makers, opinion leaders, and change agents within the social system of EMS and local government authorities responsible for EMS operations.

Definitions

Emergency medical services (EMS): The term was introduced within the 1966 white paper "Accidental Death and Disability: The Neglected Disease of Modern Society." Originally, the term encompassed all facets of emergency care, from the time of injury through rehabilitation, but it has evolved over the years to include only those providers who perform prehospital emergency care, such as emergency medical technicians, paramedics, and firefighters (Accidental Death & Disability: The Neglected Disease of Modern Society, 1966).

Emergency Medical Treatment and Labor Act (EMTALA): Legislation passed into law in 1986, ensuring public access to medical treatment in hospital EDs regardless of ability to pay (CMS, 2018).

Enhanced 9-1-1: Is an emergency communications system that routes emergency calls to the nearest dispatch center and provides stored data to include resident location and names. The system also allows for other data to be linked, such as medical history, criminal history, frequency of calls and notes from dispatchers and emergency responders (Federal Communications Commission, 2018).

Health Insurance Portability & Accountability Act (HIPAA): Legislature signed into law in 1996, that protects patient privacy through the confidential handling of protected health information, reduces healthcare fraud and abuse, and provides the ability to transfer health insurance upon changing jobs (DHHS, 1996).

Mobile integrated healthcare/community paramedicine: The term evolved from the 1996 industry publication *Emergency Medical Services Agenda for the Future* and has been recently defined as, "…the provision of healthcare using patient-centered, mobile resources in the out-of-hospital environment that are integrated with the entire spectrum of healthcare and social service resources available in the local community" (Zavadsky & Hooten, 2016).

National EMS Information System (NEMSIS): A national database tracking system functioning as the national repository of reported data related to EMS (National Emergency Medical Services Information System, 2018).

Patient Protection and Affordable Care Act (PPACA): Legislation signed into law in 2010, mandating many changes in the healthcare and insurance industries with an overarching goal of improving patient care and access to services while also reducing costs (DHHS, 2018).

Value-based purchasing: Refers to a service/payment model based on specific clinical performance and patient experience metrics. The value-based purchasing model was introduced in 2012 amid Medicare reimbursement restructuring that allowed for bonuses and penalties to be applied based on adherence to the metric and replaced the fee-for-service metric, which was the previous standard model (Zavadsky & Hooten, 2016).

Assumptions

It was assumed that selected participants would respond truthfully to questions and provide original feedback that was expressive of their own thoughts, beliefs, and opinions. It was assumed that selected participants were representative of the general population they were chosen to epitomize. It was assumed that community paramedicine programs would continue to be pursued on the federal and state levels and that Tennessee leaders would continue to develop an educational curriculum and sanction future community paramedicine pilot programs.

It was assumed that key decision makers were not likely to voluntarily adopt community paramedicine programs without some form of incentive, and this logic and perspective aligns with the principals of relative advantage, expressed in Rogers' (2003) theory of diffusion of innovations as proffering economic gain, social prestige, or some

other form of identifiable gain. It was assumed that selected key decision makers belonged to an intrinsic social system that engages in joint problem solving and the pursuit of common goals, as defined by Rogers (2003). It was assumed that the process of adopting new innovations progresses in a five-step, chronological sequence as follows: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation, as expressed in Rogers' (2003) theory of diffusion of innovations. It was assumed that other elements of Rogers' theory of diffusion of innovations, which were initially unknown, may find application to this study. It was assumed that parameters of other applied theories, as aforementioned, may have an undetermined future influence on this study.

Scope and Delimitations

The scope of the study focused on the attitudes, opinions, and beliefs of key policy makers toward adopting community paramedicine programs, as well any existing or anticipated factors that threatened to preclude the adoption of community paramedicine programs in Tennessee. Also, the scope of the study existed primarily within the knowledge and persuasion stages of the innovation decision process (Rogers, 2003). Delimited were those having expressed opinions but a lack of direct authority or influence, such as EMS workers and other allied healthcare workers who may be affected by outcomes but who have no control over the process itself. While the opinions of individuals and programs in other states may have influenced selected participants and led to subsequent emerging inferences, such individuals and programs were delimited geographically, as the study was restricted to the state of Tennessee.

Limitations

Certain limitations were inherent to the study, such as a lack of existing data, which was attributed to the novelty of community paramedicine programs in Tennessee, as there were no previous or existing pilot programs in the state from which to draw inference. In addition, and in holistic perspective, there was a lack of EMS research due in part to limited access to protected patient information. Also, there was a lack of accessible data among existing community paramedicine programs and an inability to track patient interventions, costs, and outcomes due to inconsistent reporting of related data (Patterson & Skillman, 2012).

There was also a lack of reliable data due to inconsistent reporting and missing data in national tracking systems such as NEMSIS, as well as an inability to discern services provided through community paramedicine programs from services provided by other caregivers in the healthcare claims data process (Patterson & Skillman, 2012). Limitations related to validity, and intrinsically linked to methodological selection, included a perceived level of ambiguity, as the study occurred in the natural setting, and such uniqueness may have encumbered replication (Wiersma, 2000). As prevalent convention denotes, issues of generalizability may exist in the traditional case study design, as well as unintended bias, and while not necessarily a limitation, the subjective nature of the methodological approach itself warrants disclosure. No measures to address limitations were considered in this study.

Significance of the Study

Community paramedicine programs offer viable solutions to several healthcare

dilemmas, including hospital ED overcrowding, E-911 abuse and dependency, treatment

of chronic diseases, and alternative transportation options for elderly and mentally ill

patients to appropriate facilities (Heightman, 2013). Findings from this study contribute

to the existing body of community paramedicine research and introduce Tennessee

initiatives into the collective mix of data. This study responded to the call for further

research and, specifically, the need to identify barriers to innovation and adoption of

community paramedicine programs, as identified and expressed by National EMS

Advisory Council (Beck et al., 2012). The study also provided insight to concerns

conveyed in the National Agenda for Community Paramedicine Research, such as

furthering awareness, familiarizing political policy makers with EMS initiatives, and

increasing EMS agency participation in research projects (Patterson & Skillman, 2012).

This study was a leading community paramedicine research effort in Tennessee

and explored participant opinions, potential preclusions, and other factors identified by

key decision makers, opinion leaders, change agents, and other individuals possessing

influence over the policy process. The study was an overarching effort to subjectively

explore the willingness and readiness of leaders to adopt community paramedicine

programs in Tennessee.

Summary

Chapter 1 included a definition of community paramedicine programs and how

the adoption and implementation of such programs might impact the communities they

will serve. An introduction to the background, rationale, and methodological approaches

have been duly expressed and appropriately situated within the study. Chapter 2 will

include a detailed review of the literature, as deemed both pertinent and currently

significant.

A driving force behind community paramedicine programs can be attributed to

mandated influences of the PPACA and CMS, coupled with a recognized need for change

in the healthcare industry. However, recent political changes threaten existing initiatives

and have created uncertainty for the future. Chapter 2 provides an overview into the

existing literature, as well as an intrinsic examination of the relevant history, current

issues, and forecasting pertaining to the future of community paramedicine.

Chapter 2: Literature Review

Introduction

Recent healthcare reform efforts and the uncertainty of future reform in the United States has created a state of ambiguity in the healthcare industry. The potential instability of the PPACA has cast further reservation and bewilderment among key providers. Amid all consideration, EMS remains at a crossroads and careful planning is needed to secure future sustainability in the healthcare delivery system in the United States (Zavadsky & Hooten, 2016). Community paramedicine programs may offer viable solutions and fill existing gaps in the healthcare delivery system.

The purpose of the study was to explore the readiness and the willingness of policy decision makers to adopt community paramedicine programs in Tennessee in the absence of a concise and recognizable relative advantage (Rogers, 2003). The study explored factors that threaten to preclude the adoption of community paramedicine programs, such as specific opinions and political positions of leaders, as well as other influences that may have a bearing on the final decision to adopt programs in the state of Tennessee.

Most of the articles and related data in the literature review are recent, as the topic itself is current and ongoing. However, certain publications and proffering data—specifically regarding the chosen theoretical framework centered around Rogers' theory of diffusion of innovations, last published in 2003—are dated but relevant to the study and the progression of the concepts of community paramedicine. Dissertations are limited in number due to the relative newness of community paramedicine programs. This

chapter will address topics including the literature search strategy used, the theoretical foundation, and an extensive review of related literature.

Synopsis of Current Literature

In effort to frame a concise synopsis, it is important to recognize the initial concepts of EMS and the foundation and vision that formed the new paradigm of community paramedicine. The premier example is the NHTSA's (1996) *Emergency Medical Services Agenda for the Future*. The project envisioned a future of community-based healthcare where EMS functioned in a larger integrated system. With its speculative predictions, the publication introduced the framework for modern community paramedicine programs and has served as a cornerstone in the relative literature. Three other NHTSA publications—*Education Agenda for the Future*: *A Systems Approach*, *Rural and Frontier Emergency Medical Services Agenda for the Future*, and *EMS Workforce for the 21st Century: A National Assessment*—conclude an industry-based block of literature that has cast and defined this new prehospital practitioner from an internal perspective.

Much of the available literature focuses on topics that validate a need for community paramedicine programs, such as hospital ED overcrowding or E911 caller abuse and misuse of EMS services, rather than focusing on community paramedicine programs themselves. However, Bigham, Kennedy, Drennan, and Morrison (2013) presented a systematic review of existing literature from January 1, 2000 through September 30, 2011, that served to narrow the field of available literature during that timeframe. Medline, Embase, and CINAHL were the databases accessed and the study

process followed the Cochrane methodology for systematic review. Studies prior to the January 2000 start date were not considered due to a lack of a clear definition of community paramedicine.

The researchers identified 3,089 citations, of which ultimately yielded only 11 peer-reviewed articles that focused on community paramedicine. Of the 11 studies, only one randomly controlled trial was conducted. Although one other study did use the results from the randomly controlled trial, the other studies were either qualitative in nature or focused on case control, safety, or economic aspects. In addition, none of the 11 studies was conducted in the United States; nine of the articles were from the United Kingdom and the remaining two were from Canada and Australia (Bigham et al., 2013).

Extending beyond the September 2011 conclusion of Bigham et al.'s (2013) systematic review of the literature, there appears to have been an insurgence of material in trade magazines and peer-reviewed articles regarding community paramedicine. While not routinely peer-reviewed, articles appearing in trade magazines such as *EMS World* and *Journal of Emergency Medical Services* have served to monitor the pulse of community paramedicine efforts, offering program profiles, legal status updates, training, and insights from industry leaders. Such articles have valid importance due to their influence on an industry with a scant and fragmented research base. Both journals and their collective contributions will be detailed further in the chapter.

References to actual studies of community paramedicine remain limited, particularly when necessitating an identifiable methodology as a search criterion. Among those existing, one of the more highly profiled and recent studies is the expanding

paramedicine in the community research effort sponsored by St. Michael's Hospital in Toronto, Canada. Researchers focused on the treatment of three chronic diseases—diabetes mellitus, heart failure, and chronic obstructive pulmonary disease—and used a pragmatic randomized controlled trial to compare community paramedic interventions to the existing standard of medical care (Drennan, 2014). While the 3-year study concluded in September 2016, and definitive data and analysis is not yet available, Drennan (2014), reported a lack of convincing evidence supporting a recognizable impact of community paramedicine programs on health outcomes. Authors also claimed an existing lack of quality research aimed at evaluating the effects and economic impact of community paramedicine programs.

Two other notable studies were also conducted in Canada, both in Ontario and both qualitative, and in the same timeframe of 2012–2013. In one study, researchers conducted an ethnographic case study to produce a viable model of care (O'Meara, Stirling, Ruest, & Martin, 2016), while the other researchers examined participant perceptions of community paramedics, new services, and programs (Brydges, Denton, & Agarwal, 2016). One of the premier studies in the United States, conducted on behalf of Pinellas County, Florida, and the City of Oldsmar Fire Department in 1998, was an effort to analyze local and state factors that would either support or impede the provision of community-based healthcare delivered through the fire department. While the study did not confirm a specific methodology, it did provide, within the literature review, a list of existing programs in the United States at that time.

Several dissertations have been dedicated to the study of specific programs. One researcher compared two alternative North Carolina models involving a treat-and-release program in Orange County and telephone triage program in Mecklenburg County (Krumperman, 2013). Another researcher examined hospital readmission rates and costs among participants enrolled in the MedStar Mobile Healthcare Readmission Avoidance Program (Hostettler, 2016). Other dissertations and thesis efforts exist, but they focus on topics such as research utilization, feasibility and safety of programs, and filling gaps in the healthcare delivery system.

Several larger studies involving specific policies have emerged within the last 5 years. For example, in a 2013 study, researchers examined the potential impact on EMS if Medicare and Medicaid policy allowed for reimbursement of services other than hospital transports and to estimate the potential savings (Alpert et al., 2014). Another study conducted in 2014, combined a survey of EMS officials and state offices of rural health with metrics of the Medicare Rural Hospital Flexibility Program (Pearson, Gale, & Shaler, 2014).

While past research has been largely finite in scope and nature, recent efforts provide a more forward cohesiveness. In a conference held October 1–2, 2012, in Atlanta, Georgia, the North Central EMS Institute, in partnership with the Joint Committee on Rural Emergency Care and the Rural Health Research Center, created the National Agenda for Community Paramedicine Research, which identified gaps in existing literature and called for additional research. Another study sponsored by the National EMS Advisory Council (2014) identified a list of gaps and deficiencies.

Several of the above studies will be discussed in further detail in this chapter, as well as additional studies, trade articles, and peer-reviewed material, which collectively construct the existing body of research literature. Also, this chapter will contain the search strategy and databases used to produce the related literature. The theoretical foundation chosen and the rationale for its application will be discussed at length in this chapter, as well as a broader, more exclusive review of related literature.

Databases and Search Strategy

The search strategy involved building on Bigham et al.'s (2013) systematic review of the literature, which effectively narrowed the field of applicable literature prior to September 2011. In consideration of the vast number of available databases, the sum of information was located within only a handful of selected databases and recurrent to reasonable saturation. BioMed, as alphabetically privileged first, rendered 464 results for *community paramedic,* 39 results for *paramedicine,* and 1,224 results for *mobile integrated healthcare.* In addition to those key terms, there were 92 results for *extended scope paramedic,* 172 results for *hospital ED overcrowding, 217 results for emergency room overcrowding,* and 128 results for *paramedic treatment of chronic illnesses.*

CINAHL & Medline, Homeland Security Digital Library and ProQuest Health & Medical Collection were also used as well as dissertations and theses, and Walden University Dissertation and Theses. ProQuest Health & Medical Collection and Homeland Security Digital Library offered the highest number of results—6,574 and 3,454, respectively—for the term *community paramedicine. Mobile integrated healthcare* drew 11,727 result hits on the ProQuest site and 6,860 on Homeland Security alternative.

Many results included subject matter that lacked direct correlation and was therefore

discarded. The following is a list of terms and combinations used: *community paramedic,*

community paramedicine, mobile integrated healthcare, extended (or) expanded care

paramedic, paramedic extended scope of practice, hospital (or) emergency room

overcrowding, and *paramedic treatment of chronic illness.*

Theoretical Foundation

The foundational theory for this research effort was Rogers' (2003) theory of

diffusion of innovations. The theory, first published in 1962, is rooted in rural sociology

and gained notoriety during the study of hybrid corn seed use among Iowa farmers. Other

supporting theories include subsequent approaches branching from Rogers' original

theory, particularly models of adoption introduced by Vishwanath and Barnett (2011). In

addition, theories such as Fishbein and Ajzen's theory of reasoned action (2004) and

Wilber's integral theory (2001) were considered but ultimately deemed unnecessary.

Sabatier (1999) referred to dominant theories of innovation in the public policy

literature and explained how such theories borrow from existing models that examine the

innovative behaviors of individuals, institutions, and organizations. Public policy theories

include diffusion models, such as the national interaction model, which recognizes a

national communication network among state officials, regional diffusion models,

vertical influence models, and internal detriments models that the later presumes factors

influencing adoption as being linked to political, economic, and social issues inherent to a

specific governing body and, hence, less dependent on the influence of other governing

bodies.

While a host of innovation theories and models have been used to study the adoption of public policy among government entities, Rogers' diffusion of innovations theory expands well beyond the confines of public policy, serving traditions and academic disciplines such as anthropology, education, rural sociology, communication, marketing, public health, and medical sociology. In each of the traditions, the theory is typically used to study one specific type of innovation. Although the hybrid corn seed study conducted by Ryan and Gross (1950) launched the new paradigm of diffusion studies, diffusion research was being conducted as early as the 1920s in anthropology research (Rogers, 2003).

Rogers (2003) mentioned a reluctance among anthropologists to use quantitative research tools; they instead favored direct participant observation. One such exemplar study involved boiling water in the peasant village of Los Molina, Peru; a 2-year campaign was conducted to persuade villagers to adopt the practice of boiling drinking water as a measure of purification to eliminate harmful bacteria. Ultimately, the alien concepts of germ theory were not enough to displace deep-rooted culture among villagers, and the attempt to diffuse the innovation of boiling water failed (Rogers, 2003).

In a more paralleled example, the Columbia University Drug Study of 1954 analyzed the diffusion of tetracycline, a new antibiotic drug that replaced previously used antibiotics to an extent measurable to the hybrid corn seed study. The predominant theme that emerged involved the existence and influence of interpersonal diffusion networks among opinion leaders, which in this case were the doctors. Regarding the contribution to

the holistic body of diffusion research, Rogers himself credits the Columbia study as establishing diffusion as a social process (Rogers, 2003).

Although examples of qualitative methodologies used in diffusion research are not limited to the anthropology tradition, early documentation of their use embeds qualitative research firmly within the diffusion research paradigm. As with this research project, it is anticipated that the answers to specific research questions may exist beyond the realm of quantitative measure, and while lengthy ethnographic study remains impractical, it will be necessary to gauge the opinions of decision makers existing within interpersonal diffusion networks—in this case, opinion leaders within EMS organizations, government leaders, and others positioned to influence the adoption of community paramedicine programs in the state of Tennessee.

In correlating diffusion research with the study, it is essential to identify at which stage of the innovation-decision process community paramedicine currently resides. The innovation-decision process exists within five levels of communication channels: knowledge, persuasion, decision, implementation, and confirmation. In Tennessee, at the state level, community paramedicine is currently in the fourth stage of the process, the implementation stage. However, paradoxically, EMS agencies and local governments remain in the first and second stages of knowledge and persuasion when gauged along the communication channels continuum. Examining this paradox was essential to this study, as community paramedicine was first introduced to Tennessee State EMS board members on June 30, 2014 and has progressed slowly through task force subcommittee since March 2016, with the last published board minutes released for the February 2016

meeting. During the February 2016 meeting, a potential draft of an educational

curriculum was reviewed, and Dr. Pat O'Brien raised concerns of implementation and

available financing.

Due to the protracted state of this specific implementation process, diffusion

research appeared most appropriately suited for continued study, as there appears to be

unknown factors precluding forward progress towards implementation. In addition to the

inherent uncertainty associated with new innovations in general, ambiguity surrounding

the future direction of healthcare delivery, coupled with the promise to appeal the

PPACA and the allusion of privatizing Medicare, appears to have facilitated a state of

indecision within the EMS field, as well as the broader healthcare system. Within this

current climate, it is important to note that implementation of community paramedicine

programs will occur on two separate tiers and that future decision makers, those who will

ultimately decide to adopt or reject programs, will be a different set of people than the

original adopters at the state level who are now overseeing implementation.

Diffusion Research Literature

Perhaps the most famous of all diffusion studies is the Iowa Hybrid Corn Seed

Study presented by Bryce Ryan and Neal Gross in 1950. In contrast to the

anthropological studies, the corn seed study used quantitative methods, including surveys

and interviews with 345 farmers in two separate Iowa communities. However, the final

data analysis was based on 259 participants, from which 257 adopted the hybrid seed

between 1928 and 1941 (Rogers, 2003). The Iowa study is exemplar of a rapid rate of

adoption, which all adoption, regardless of rate, can be charted cumulatively and

presented using the S-shaped curve of diffusion. Rogers (2003) identified adopter

categories as: innovators 2.5%, early adopters 13.5%, early majority 34%, late majority

34%, and laggards 16%.

Although the Iowa study used quantitative methods, it was important to this study

because of its near text-book success. With a high rate of adoption and clear and

identifiable presence of relative advantage, as the hybrid corn seed yielded about 20%

more product than the open-pollinated seed previously used. The Ryan and Gross study,

which was first published in the trade journal *Rural Sociology* in 1950, has since served

as a premier example of diffusion research and the impact of individual behaviors upon a

specific social system. Rogers (2003) described the diffusion process as an innovation

that is communicated over time and existing within a specific social system. The Iowa

study provides an established diffusion model that represents a near-perfect case scenario,

with all elements in place supporting success. It will serve this research as a model study

for comparison, as foundational pillars such as communication and relative advantage

become challenged within the constructs of the study at hand.

In a similar effort to that of the water-boiling study mentioned earlier, an

ethnographic approach was used, along with quantitative measures, to research the

diffusion of pure drinking water in Egyptian villages, specifically those concentrated

along the Nile River Delta. The Egyptian government, with financial aid from the U.S.

Agency for International Development, designed and built a water-delivery system that

provided pure, chlorinated drinking water to centrally-located public spigots, yet most

villagers continued to get their water from the polluted canals that contained many health hazards (Rogers, 2003).

The condition of the canal water was deplorable, as observed by diffusion scholar David Belasco, who claimed the canal was often covered with green algae during hot weather, and at one point, contained a dead and bloated donkey putrefying in the searing sun and floating in obvious view of several villagers collecting water nearby. In addition, villagers also used the same canals for urination, defecation, and to wash clothes. Furthermore, the canal water is home to a species of snails that are hosts to the parasites responsible for schistosomiasis, a disease rendering the village children stupefied and zombie like (Rogers, 2003).

Belasco could not understand why the villagers would continue collecting and drinking the putrid water when clean, purified water was available to the public (Rogers, 2003). In fact, more than half of the villagers continued to drink canal water, and if they did drink the pure water, it was most often mixed with canal water and stored in earthen vases called *zirs*. Belasco discovered among female water gatherers from three separate villages, that most disliked the pure water because of its chlorinated taste, and because many villagers believed the chemicals were aimed at reducing sex drive among villagers in a governmental effort to control the population. Also, the system was strained by overuse as well as misuse, as it often delivered inadequate amounts of water, and when pumps broke, they remained in disrepair as there were no parts nor personnel to fix them. In addition, the ritual of gathering on the canal banks to collect water or to wash clothes

was embedded within the local culture, adding a social element to the daily practice (Rogers, 2003).

The Belasco study, which was conducted in 1989, was of interest to this study because it successfully identified and surmounted the pro-innovation bias inherent to diffusion research. The pro-innovation bias is the belief among innovation supporters that a given novelty should be automatically adopted and rapidly diffused among all members of a proposed social system. The Belasco study suggests that adopter opinions may differ from those of the innovators, and that precluding factors may exist among adopters that may not have been considered by those designing or supporting a given innovation. Such factors were relevant in this study as well, specifically when exploring the likelihood of adoption, as a devout commitment to status quo and an apparent lack of relative advantage existed among certain participants (Rogers, 2003).

Foundational Publications

The Emergency Medical Services *Agenda for the Future*, a federally funded position paper, represents an original effort by the NHTSA to align EMS with projected future needs and visionary goals. The vision projected the future of EMS to be community focused and fully integrated with the broader healthcare system, both possessing the ability to identify illnesses and to also provide appropriate care for acute and chronic conditions alike (NHTSA, 1996). The agenda was published in 1996, 30 years after the original EMS white paper: Accidental Death and Disability: The Neglected Disease of Modern Society, published in 1966 by the National Academy of Sciences, a landmark paper often credited for blueprinting the foundations of EMS in the

United States. The opening statement of the 1996 EMS Agenda for the Future projects

that future EMS must be integrated with other services and systems and be willing to

expand its involvement to promote the overall health of the community (NHTSA, 1996).

It is boasted within the publication that much had been learned during the first 30 years of

EMS, and that those experiences must be used to form a basis which allows a future path

to be forged (NHTSA, 1996).

The language and overarching goals contained within the vision statement for the

EMS Agenda for the Future mirrors the current goals of community paramedicine. The

unwavering similarity is so striking that it warrants full representation in this document,

and being as such, is offered below in its entirety:

Emergency Medical Services (EMS) of the future will be community-based health

management that is fully integrated with the overall healthcare system. It will

have the ability to identify and modify illness and injury risks, provide acute

illness and injury care and follow-up, and contribute to treatment of chronic

conditions and community health monitoring. This new entity will be developed

from redistribution of existing healthcare resources and will be integrated with

other healthcare providers and public health and public safety agencies. It will

improve community health and result in more appropriate use of acute healthcare

resources. EMS will remain the Public's emergency medical safety net (NHTSA,

1996).

The *EMS Agenda for the Future* identified 14 specific EMS attributes in which

continued development would be necessary in ensuring future success: *Integration of*

health services, EMS research, legislation and regulation, system finance, human resources, medical direction, education systems, public education, prevention, public access, communication systems, clinical care, information systems, and *evaluation.* (NHTSA, 1996).

The document breaks down each of the above categories and offers assessments on: *Where we are*, and a vision of *Where we want to be*, as well as suggestions on *How to get there*. While many of the original objectives have seen realization, such as the implementation of national 9-1-1 systems, other goals remain unmet, such as EMS triage ability and allocation of resources based on individual patient needs, allocation of federal and state funds earmarked for EMS research and developing a compensation model based on preparedness and reducing "…volume-related incentives" contingent upon patient transport (NHTSA, 1996).

Answering their own call for EMS educational development, as prescribed in the 1996 *EMS Agenda for the Future*, the EMS Education Task Force was spawned from another NHTSA effort to enhance national EMS education. While the document's content is largely unrelated to the promotion of community paramedicine concepts, it remains a chronological component in a series of position papers dedicated to the holistic advancement of EMS systems within the United States. Henceforth, it is included as a foundational basis of EMS educational standards, upon which must be expanded to include the provision of future community paramedicine services.

Published through the National Rural Health Association (NRHA), *the Rural and Frontier Emergency Medical Services Agenda for the Future* aims at advocacy for those

residing in rural America, both for EMS systems and patients alike. The position paper

follows a post 9-11 portfolio expansion of grant funding allotted to the Office of Rural

Health Policy, in which specific grants targeted the funding of rural health initiatives such

as rural access to emergency devices, rural emergency services training, and a Medicare

rural hospital flexibility grant. Within the executive summary, it is noted that rural areas

represent 80% of the actual land and 20% of the total population in the United States.

Also mentioned is the need for medical intervention as opposed to simply transporting

patients to the nearest hospital ED, as some interventions are rapidly and critically

necessary to sustain life under certain medical and traumatic circumstances.

    Foremost, the paper identified a diminishing availability of local resources,

including physicians and hospitals, that are also subject to geographical and

organizational challenges impeding rapid and appropriate medical care. Also identified is

the concept of the rural advanced life support paradox, a byproduct circumstance

commonly found in rural communities where advanced life support care is more greatly

needed than in urban areas, yet less available due to limited availability of resources. The

rural agenda is of specific importance as conditions continue to deteriorate with more

rural hospitals closing across the country, and of unique importance to this study as rural

and frontier medical care is a vital component of community paramedicine, as explicitly

evident in primary care models that extend certain physician care provisions to EMS

personnel.

    The NHTSA's EMS Workforce for the 21st Century: A National Assessment, was

published in 2008, and represents another position paper that considered the future of

EMS as an industry. Unique to this NHTSA effort was a collaborative approach among the host agency and the University of San Francisco Center for the Health Professions and the University of Washington Center for Workforce Studies, Department of Family Medicine, and the latter two contributed through a paired research project specifically addressing the future viability and sustainability of EMS. Primary research questions targeted dynamics such as the size and composition of the future EMS workforce, employee retention, adequate coverage for both rural and urban areas, and a potential lack of data needed to make future predictions. The research employed a mixed methods approach in which both qualitative and qualitative strategies of data collection were used. Qualitatively speaking, and in addition to structured interviews and field observation, an online blog was also used as an informal venue allowing EMS insiders to discuss various related issues (NHTSA, 2008).

Key findings in the study identified a shifting national demographic in which an increasing number of retiring baby boomers upsurges the prevalence and necessity for future geriatric care, coupled with a varied ethnic composition denoting a future need for a more ethnically diversified workforce. Recruitment of EMS personnel was also recognized as being an enduring and inherent obstacle, and one which no current national model of recruitment serves to standardize criterion. Retention of EMS personnel, innately linked with recruitment, trumps the pair in terms of gravity as stagnant wages, benefits, and intrinsic structures impede upon career growth and overall worker satisfaction. In addition, work related injuries and illness also affect EMS employee retention rates holistically in both urban and rural markets. Of noteworthy interest, it was

revealed that EMS personnel are much younger than other public safety and healthcare

professionals—an issue perchance extending from poor recruitment and retention efforts,

and one that may warrant future research (NHTSA, 2008).

Community Paramedicine Research Prior to 2012

Bigham et al. (2013) conducted a systematic review of existing literature to

include all studies that addressed an expanded role or enhanced scope of paramedic

practice in the community. The review included all research articles written in the

English language that identified a specific research methodology and was published

between January 1, 2000 through September 30, 2011. As a disclaimer, the authors stated

that the beginning point of the research was chosen in the absence of a clear definition of

community paramedicine prior to that date (Bigham et al., 2013). Using multiple

advanced strategies, including the Cochrane methodology for systematic reviews, the

Medline, Embase, and CINAHL databases were researched using predetermined criteria

(Bigham et al., 2013).

The data selection criteria included all articles measuring a patient-related or

system related outcome with relevance to an expanded scope of practice among

paramedics serving within the community setting. A data abstraction tool was used to

identify design aspects such as the specific study design, demographics, control and

interventions, EMS provider type, settings, and outcomes. The initial search yielded

3,089 results, of which only 11 articles qualified as meeting final criteria (Bigham et al.,

2013).

Of the eleven articles reviewed, all but one was favorable to the idea of paramedics functioning within expanded roles of patient care, with the remaining article rendering no significant difference. However, the exact roles and subsequent safety and effectiveness of expanded scopes of practice where lacking in supported evidence, as well as concise objectives of community paramedicine programs. The authors close by calling for further pragmatic research among a wide range of stakeholders (Bigham et al., 2013).

Existing Programs

Renfrew County Program

In an ethnographic case study conducted in Renfrew County, Ontario, data was amassed through interviews, as well as through focus groups and field observations, with the overarching goal of developing a community paramedicine model of care. The study built upon a previous multiple case studies conducted in Australia and focused on a level of field immersion necessary to facilitate the collection of rich data that promoted an experiential intuition revealing social practices typically not publicly visible. Threats to bias were addressed by selecting a wide range of participants, as well as using multiple researchers and methods of collection (O'Meara et al., 2016).

The study focused on a single existing community paramedicine program in Renfrew County, Ontario that offered four separate subprograms: Aging at home, paramedic wellness clinics, ad hoc home visiting program, and a community paramedic response unit program. Study participants were selected from community members, patients, patient families, paramedics, paramedic educators and managers, physicians,

nurse practitioners and other allied health providers, health economists and health service managers. Three separate focus groups were created, each containing between 10 to 20 participants and involving a total of 34 semi-structured interviews. Field observations were carried out by two researchers, each working independently and shadowing community paramedics on related calls. In addition, aspects of boundary theory were used as a lens to explore how community paramedics were functioning within the new expanded role (O'Meara et al., 2016).

The boundary lens provided an appropriate perspective into the break from traditional roles and established domains inherent to prehospital care. Also, the element of permeability was considered, to the extent that established structures within the larger healthcare system limit the function and scope of practice of paramedics, which may have a profound influence on the success of new innovations such as community paramedicine (O'Meara et al., 2016).

In addition to community paramedic domains, other result categories emerging included:

- Response to emergencies
- Higher education
- Engagement with community
- Enabling factors
- Treatment and transport options

Emerging from the study was the RESPIGHT CP model of patient care, which served as a modification of the RESP model of care. The researchers claimed that aspects

of the RESPIGHT model reflect unique differences from other models of care, such as community paramedicine models existing in the United States (O'Meara et al., 2016).

A relevant aspect of this study remains that it was designed with the overarching purpose of creating a new community paramedicine model of care, as was duly expressed by the authors of the study themselves. By the intent of the study alone, to convert its foremost objective into the reasoning of diffusion research, is to subject it to the inherent shortcomings of pro-innovation bias—as will be the case in other research efforts where the objective is determined at conception as opposed to emerging from the data itself. Rogers (2003) described pro-innovation bias as the presumption that an innovation should be adopted and diffused as designed and with little or no opposition.

CHAP-EMS Program

Brydges et al. (2016), conducted a qualitative research study in which the researchers focused on participant perceptions of community paramedics and services provided by the Community Health Assessment Program through Emergency Medical Services (CHAP-EMS), a program in which cardiovascular and diabetes prevention services were limited to a specific residential housing community in Toronto, Canada. Approximately 260 senior citizens lived at the residential complex during the four-month study of the CHAP-EMS program, in which paramedics routinely visited residents during weekly scheduled visits. A total of 79 residents participated in the research project, producing a total of 1,365 visits from which data were retrieved (Brydges et al., 2016).

The study employed an interpretivist design where participant observation and semi-structured interviews were conducted in an ethnographic manner, including periods

when participants were observed in the waiting area as they were waiting to be seen by the paramedic staff. Oddly, it was discovered that participants were gathering in the lobby area to socialize with other participants, even when they had no medical purpose for being there. In addition, a similar social connection developed between the participants and their paramedic caregivers, as relationships were formed where the basis of interactions exceeded the topics and scope of individual healthcare needs. The relationships forged between the paramedics and participants were more like friendships and different from the typical relationships existing among other healthcare providers (Brydges et al., 2016).

A thematic approach was used to analyze data collected from both the interviews and observation periods, which allowed for flexibility within the study and for the emergence of new themes. Emerging themes included enhanced relationships between the participants and their paramedic caregivers and reported increased feelings of security among the most vulnerable patients. In addition, paramedics were viewed as being caring and respectful, as well as being considered as healthcare professionals. The authors recognized the depth and breadth of existing research, which has focused on the doctor-patient relationship, lending merit to the inherent power dynamic existing at the core of much of the research examples. However, the relationships that participants formed with the CHAP-EMS paramedics appeared much more informal and placed the paramedics in more of an advocacy role, which appeared to empower patients (Brydges et al., 2016).

In synthesis to the emerging evidence of the study, when the participants began gathering in the waiting room to socialize, it was a typical example of homophily, as the

patients were all similar in age, social status, health, and other attributes, which according

to Rogers (2003), such propinquity promotes homophily communication. In contrast and

listed among the more distinct problems affiliated with diffusion research, is the

heterophily relationship between innovators and adopters, as the innovators are unlike

adopters, at minimum, in the knowledge of the innovation itself. In other words, the more

alike innovators are with the adopters, the more likely rapid adoption and diffusion is

likely to occur. However, to restate a rational deduction, a minimum degree of

heterophily must exist for the process of diffusion to occur (Rogers, 2003).

Although not presented in such a manner by Brydges et al. (2016), the possibility

that the CHAP-EMS paramedics shared a greater sense of homophily with the

participants than the actual doctors and nurses, may be attributed to a few considerations,

such as a more informal setting, or even the increased amount of time paramedics spent

with their patients. Perhaps, by fulfilling an advocacy role, the paramedics worked with

the participants to accomplish the common goals of healthcare needs, subsequently

forming an identifiable social system, which Rogers (2003), claimed that such common

goals fuse a social system that allows diffusion to occur. At minimum, the trust gained

between the participants and paramedics promoted effective communication and

produced what many participants referred to as true friendships (Brydges et al., 2016).

North Carolina Programs

Krumperman (2013) claimed that too many patients with low acuity medical

conditions depend on EMS and hospital EDs for medical care, which would be more

appropriately treated in nonemergency settings such as a clinics and primary care

physician offices. The study compared two North Carolina pilot program models that differed in paradigm as well as in objective. The Orange County program followed a traditional response roll referred to as ETR, where the paramedic would evaluate patients on scene and then determine if hospital ED transport was necessary and warranted. The Mecklenburg County counterpart used a TTR system, which employed nurses and evidence-based protocols to validate ambulance necessity prior to responding (Krumperman, 2013).

The findings supported a significant difference in the way patients from the two groups followed instructions, as the patients receiving instructions over the phone were more likely to follow the given instructions than patients receiving similar instructions in person. However, in consideration, the Orange County program used a broader spectrum of patient conditions which may have impacted data results. Nonetheless, high participant satisfaction was realized globally, which was interpreted as a willingness among low-acuity patients to accept alternative solutions that did not result in transport to a hospital ED (Krumperman, 2013).

Krumperman's claim of hospital ED overcrowding is supported by the National Hospital Ambulatory Medical Care Survey (Pitts, Niska, Xu, & Burt, 2008), which reported a 31.1% of ER visits in the United States to be for routine or episodic care, that were not of an acute or urgent nature. Krumperman merged the problem of hospital ED overcrowding with the more overarching condition of healthcare in the United States, stating that the U.S. spends more money on healthcare than any other industrialized nation, resulting in a lagging and disproportionate yield of successful patient outcomes.

In comparison, the U.S. spends more than one and one-half times as much as any other of the 30 Organization of Economic Cooperation and Development (OECD) countries, and subsequently outpaced all other OECD countries at a fiscal rate of nearly 4% of GDP between 1980 and 2008 (Krumperman, 2013). Krumperman further claimed that a natural result from increased spending would likely yield improved outcomes, which the opposite appears more apparent in the United States, specifically in areas of infant mortality, life expectancy, and mortality rates among Americans when compared to residents of other OECD countries (Krumperman, 2013).

Krumperman provides an extensive background on the history of EMS, extending even beyond the first organized ambulance service formed within the Napoleonic army in 1792, continuing forward through post WWII and the creation of the Emergency Medical Services Systems Act of 1973, and up to the NHTSA's 1996 vision for the future, which projected a more community-based healthcare system by 2010. Krumperman, citing the IOM (2013), reported an 11% decrease in U.S. hospitals between 1993 and 2003, and a 13% increase of hospital ED admissions during the same period, while subsequently conveying the ongoing efforts to manage low acuity patients, including the diversion concepts promulgated by the American Ambulance Association in 1997. While EMS remains inherently confined within the NHTSA's reach and scope, and the branded transportation role, paramedics, as practitioners, have realized expanded roles in several distinct areas (Krumperman, 2013).

In part, a product of an ongoing national nursing shortage and EMTALA transport requirements, the critical care paramedic emerged to fill new roles of expanded scope

care, which were solidified in 2002 by the CMS through the creation of a new fee schedule allowing for the transport of critically ill patients from an originating hospital to one offering a higher level of care. Efforts toward expanding the scope of paramedic care to include treatment of low-acuity or episodic patients in the prehospital setting is discouraged by design, as Medicare and other payers only pay for ambulance transports to hospital EDs (Krumperman, 2013).

The problem, perhaps, is that EMS remains fundamentally grounded in the physical act of transporting patients. CMS officials maintain the opinion that EMS services are a *transportation benefit,* and that such opinion is supported by the Social Security Act legislation, in which language frames ambulance transport as being necessary only when other methods of transport are contradicted based on the patient's condition. Ultimately, the author pointed out that while the bulk of EMS costs are allotted to sustaining a state of readiness and preparedness to respond to both medical and traumatic emergency situations, reimbursement of EMS services remain contingent on patient transport (Krumperman, 2013).

In summary, the two North Carolina counties studied were quite different in socioeconomic comparison, as Mecklenburg County is more urban with a higher population of African Americans and a higher pediatric population. In contrast, Orange County is more rural, more impoverished and with a larger adult base. The Mecklenburg County program used the TTR model, where referrals were provided by nurses over the telephone, gaining consent to referral upfront, as opposed to the Orange County program (ETR) model where callers received referral advice face-to-face from paramedics on

scene and were asked for consent to referral after the completion of initial treatment and a full patient assessment (Krumperman, 2013).

The first hypothesis suggested a difference between the two counties regarding health behaviors and patient compliance in following referral instructions. Although it was expected that the face-to-face approach used in the Orange County model would yield a higher level of compliance, chi-squared testing revealed quite the opposite, as compliance was higher in Mecklenburg County among the users speaking to nurses over the telephone. The author conceded that there are multiple variables which may contribute to the unexpected findings, but also claimed to conduct a retrospective literature search using key words such as: Nurse, paramedic, trust, and patient perception, which produced no peer-reviewed examples (Krumperman, 2013).

MedStar Program

Hostettler (2016), addressed the high cost of healthcare and the impact of repeated and often excessive use of hospital EDs by a small group of patients with chronic medical conditions. Hostettler specifically focused on heart failure, a condition she reported as affecting 5.8 million people in the United States (Hostettler, 2016). While other chronic medical conditions such as diabetes and chronic obstructive pulmonary disease (COPD) also represent a significant number of repeated visits to EDs, heart failure alone accounts for nearly one million hospitalizations annually and roughly 25% of 30-day rehospitalizations, which subsequently reduces reimbursement amounts to hospitals via readmission penalties (Hostettler, 2016). Hostettler (2016) claimed that reducing hospital readmissions requires collaboration and a need for alternative solutions.

The key objective of the project was to examine readmission rates of heart failure patients enrolled in MedStar's Mobile Integrated Healthcare Heart Failure Readmission Avoidance Program in Fort Worth, Texas during a period spanning the course of 2 years and ending all reporting by December 31, 2015. The sum of data was gathered and analyzed from a total of 94 program enrollees, which, as predicted, reflected a reduction in hospital readmissions as well as affiliated costs. Other program objectives included cost of care and overall health status of program enrollees. The Plan-Do-Study-Act model was incorporated as a theoretical basis and a retrospective cohort design was also used (Hostettler, 2016).

Within the discussion, it is noted that while the targeted readmission rates decreased as anticipated, the total number of ED visits were greater than expected—in which the author offered a range of possible explanations for the incongruence. As a limitation, it is mentioned that the study was restricted to a single program in a single community, and that studies in other locations, or the use of pooled data would be necessary for validating results. Furthermore, the author also references the IHI's Triple Aim, aligning the MedStar program and other community paramedicine models to the key elements of the initiative: Improving patient experience, quality, and satisfaction, improving the health of populations, and reducing costs (Hostettler, 2016; Institute for Healthcare Improvement, 2014).

The study is relevant as it represents a prime example of a limited number of research efforts conducted within the United States that have produced peer-reviewed literature relating to community paramedicine programs. In addition, the program models

studied, among others, are indicative to those which would likely be implemented in

Tennessee. Furthermore, MedStar continues to be a key leader and innovator of multiple

programs that target specific problems and gaps within the healthcare delivery system.

Current MedStar programs include:

- The EMS Loyalty Program, addressing high utilizers of the 911 system

- Observation Admission Avoidance Program

- Congestive Heart Failure Program

- Hospice Revocation Avoidance Program

- 9-1-1 Nurse Triage Program

- Home Health Partnership Program

- Citizen EMS Academy Program

Reimbursement for Services

Funding for potential community paramedicine programs is a significant

consideration, as there are no existing reimbursement models in place to pay for such

non-transport programs. Although Zavadsky and Hooten (2016) discussed the possible

reimbursement gateways afforded through the creation of accountable care organizations

(ACOs) and the shift from fee-for-service to a value-based payment models outlined in

the PPACA, ambulance services continue to be reimbursed solely as a supplier of

transportation. With no payment models that directly reimburse EMS for services

provided outside of transportation, some alternative solutions have been offered, such as

obtaining federal healthcare innovation grants, sponsorship funding, bundled payment or

cost avoidance programs, which the later three are contingent on stakeholders such as

hospitals and ACOs passing along shared savings to EMS agencies (Zavadsky & Hooten, 2016).

Goldberg (2014) referred to the existing EMS reimbursement model as being a *flawed paradigm* based on a CMS fixed-fee schedule, which often fails to compensate for total operating costs. The author continued by referencing the high cost involved in maintaining a constant state of emergency preparedness, a system where costs can only be recovered through increased patient transports. Such a paradox financially incentivizes an upsurge rather than a reduction in hospital ED patients, and therefore undermines the collaborative efforts outlined in cost avoidance and other shared-savings programs aimed at keeping patients out of the hospital.

In a research effort made possible through a CMS grant, authors studied a random 5% of Medicare claims between 2005 and 2009, which involved Medicare covered ambulance events. Authors reported that EMS transported 21 million patients to EDs in 2010, and that EMS providers frequently transported patients for conditions that would not qualify as true emergencies. Furthermore, through a validated algorithm, it was estimated that 12.9-16.2% of Medicare patients were transported for complaints that were either of a lower acuity or otherwise best treated in the primary care setting. In fact, according to resulting data, around 34.5% of patients not admitted to the hospital were discharged with low-acuity conditions that did not require hospital ED level of care (Alpert et al., 2014).

The research designers identified two specific aims, which the foremost was to predict a likely impact on EMS transport numbers if CMS allowed providers to manage

certain patients through alternative measures not resulting in hospital ED transport, and a second objective of calculating the resulting cost savings. Excluded in the study were pre-designated nonemergency transports, and other transports qualifying as medical transports: HCPCS codes: A0426, A0428, A0430, A0431, A0435, and A0436, as well as calls relating to traumatic injury, psychiatric, or alcohol and drug use, which were classified separately. Within the three-step process, 973,489 Medicare transports resulting in hospital admission were also omitted based on the assumption that alternate care was not appropriate since patients were indeed admitted to the hospital. Medicare cases surviving the disqualifying process were subject to study using a validated algorithm that classified discharge diagnoses into four categories of severity: nonemergent; emergent and primary care treatable; emergent, ED care needed, and preventable or avoidable; and emergent, ED care needed, and not preventable or avoidable (Alpert et al., 2014).

In conclusion, study results found that 34.5% of Medicare beneficiaries who were transported by EMS and not admitted to the hospital, ended up with low-acuity diagnoses and therefore, have possibly received medical care through an alternative source. It was further concluded that the sum of these low-acuity patients account for 15.6% of all EMS transports to hospital EDs that are covered by Medicare. It was also estimated that Medicare could have saved $560 million had there been alternative treatment options that circumvented ED transport. Within the closing discussion, it is reiterated that CMS considers EMS a transportation benefit, and that reimbursement is not allowed without physically transporting patients (Alpert et al., 2014).

Collaborative Efforts Supporting Community Paramedicine

Flex Study

Researchers interviewed state EMS officials, rural health representatives, and state Flex coordinators during a period spanning from January to September 2013. A literature review was conducted of peer-reviewed journals and trade-related publications that promoted EMS integration into the broader healthcare system. Within the study, a brief background of the Medicare Rural Hospital Flexibility Program (Flex) is provided. The Flex program was created by Congress in 1997 in efforts to support rural health initiatives through grants and other services. A target objective of the Flex Program is a commitment to improving Critical Access Hospitals in areas of quality and services, as well as developing local and regional systems. Within the later aim is where the integration of EMS becomes a relevant component within the structuring of emerging rural healthcare systems (Pearson et al., 2014).

Considering that the provision of healthcare in the rural setting was the overarching focus, the community paramedicine model in question would be the primary care and primary care extenders model. The authors pointed out that a significant challenge associated with this model is that services can closely parallel, and often interfere with services provided by other healthcare professionals, specifically home healthcare providers. In addition, the authors claimed that a lack of clarification regarding expanded roles has resulted in opposition from other healthcare providers within pilot community paramedicine programs (Pearson et al., 2014).

In summary of the key findings, authors stated that many of the rural community paramedicine programs remain in pilot stages, and that funding and reimbursement issues threaten the sustainability of programs, as well as identifying a need for collaboration and buy-in among stakeholders. Of specific interest, data from interviews claimed that data collection and program evaluation are vital considerations for policymakers developing community paramedicine programs (Pearson et al., 2014). The study is important and relevant as it examines community paramedicine programs within the United States and serves to expand upon the limited amount of available research within this specific paradigm.

National Agenda for CP Research

In another collaborative effort, The North Central EMS Institute, along with the Joint Committee on Rural Emergency Care, held a national conference in 2012 in Atlanta, GA with the aim of producing a national agenda for community paramedicine research. During the conference, representatives from the Rural Health Research Center conducted a research session in which 60 participants were grouped into pairs and interviewed in round robin fashion, each answering three predetermined questions, which were later reviewed by the researchers (Patterson & Skillman, 2012).

The interview design process topics were: *Research priorities, research challenges*, and *research resources and opportunities*. Of specific interest were findings within the category of research challenges, to include:

- A lack of EMS research infrastructure allowing facilitation of mobile integrated healthcare/community paramedicine research

- A lack of research experience within the EMS industry

- A lack of awareness and respect among external stakeholders within the broader healthcare field

- A lack of potential research support from external stakeholders such as insurance companies and other healthcare system partners

- An inherent lack of communication and trust between EMS agencies and practitioners

- A presumed resistance from other healthcare industries such as home healthcare agencies

- A lack of quality reporting systems measuring outcomes, as well as a lack of access to existing data that is protected by HIPAA

Multiple academic resources were mentioned at the conference, including the University of Tennessee, and were subsequently recognized within the third category: *Research Resources and Opportunities*. Partnerships with state and local governments were also suggested and included such agencies as health departments, state EMS offices, rural health and 9-1-1 systems. On the federal level, agencies mentioned as potential resources included the DHHS, the Department of Homeland Security (DHS), the Department of Transportation (DOT), as well as other agency branches such as the Centers for Disease Control (CDC) and the CMS (Patterson & Skillman, 2012).

National EMS Advisory Council

The National EMS Advisory Council adopted its Final Advisory on Community Paramedicine on December 4, 2014. In the opening section, an explanation of how the

PPACA affects EMS as an industry is provided at length, while disclosing that most changes affecting EMS are largely indirect. A key point conveyed as a significant difference between hospitals and EMS agencies is that the CMS offers hospital partial reimbursement for uninsured patients through Hill-Burton and Disproportionate Share Hospital payments (Beck et al., 2012). EMS receives no such reimbursement option from CMS and often recovers no money for uninsured transports. Within the language of the PPACA, EMS services are among the Essential Health Benefits , which is outlined in Title I, Subtitle D, Part I, Section 1302: Essential Health Benefits. EMS services fall under *exchange-based health plans*, but the focus is on hospital ED services, with no reference to EMS services (Beck et al., 2012).

However, EMS is mentioned within Title V Healthcare Workforce; Subtitle B; Innovations in the Healthcare Workforce, Section 5101 National Healthcare Workforce Commission, in which Beck et al. (2012) identifies such recognition as being essential to future integration into the broader healthcare system, as well as being crucial to the facilitation of possible reimbursement for services extending beyond ED transport. It is suggested that EMS, as an industry, transition beyond traditional roles and expand services to befit a more community-based system focused on treatment of chronic health conditions.

It is further asserted within the text that provisions from Title V confirms field EMS as a recognized healthcare profession. Multiple PPACA title sections are identified and explicated as including provisions which either have a direct or indirect influence on EMS as an industry. While the future of the PPACA remains unsure, certain provisions

could further align EMS for integration into the broader healthcare system, yet EMS is

scarcely mentioned throughout the respective titles (Beck et al., 2012). The closing

section offers a reiteration of the value of EMS as a community resource, along with the

mention of its unique and inherent presence within the community, aligning it to reduce

healthcare costs through more of a preventative practice model. According to Beck et al.

(2012), some of the challenges impeding future success include:

- Lack of reimbursement for community paramedicine services

- Lack of existing research illustrating a potential impact, or benefit, of EMS

    functioning in this new capacity

- Lack of community understanding as to the services available through

    community paramedicine programs

- Incapacity of policy and other decision makers to comprehend the potential

    value of realigning resources to include preventative medicine models

- Diversity of existing programs and services provided

- Inability to access NEMSIS and other relevant data

In addition to identifying challenges, it was recommended that states identify

barriers precluding innovation and adoption of community paramedicine programs.

Specifically, states were encouraged to consider reviewing the ASPR funded AASHTO

Community Paramedicine: A Legal Analysis, which addresses legal parameters and the

ability of states to regulate community paramedic programs. It was further recommended

that the Department of Transportation consider modifying NEMSIS to incorporate

community paramedicine data, and that Federal Interagency Committee on EMS organize

workshops in efforts to develop strategies for data collection. A review of the National

Consensus Conference on Community Paramedicine Research Agenda and a general

support of funding future grants was also suggested. It was further proposed that the

NHTSA work alongside the DHHS and the Department of Homeland Security in

gathering a broad range of stakeholders to develop strategy leading to implementation of

community paramedicine programs nationally (Beck et al., 2012).

Federal Interagency Committee on EMS: Strategic Plan

The Federal Interagency Committee on EMS is a Congress-mandated committee

formed in 2005 to support collaboration among EMS and 9-1-1 systems and streamline

efforts to improve the quality and delivery of EMS nationally. The 2013 Strategic Plan

generated from recommendations conveyed by the National EMS Advisory Council. The

strategic plan specifies six EMS system goals, in which the fourth goal refers to

sustainability and EMS integration into the broader healthcare system. Within the text of

this goal, community paramedicine is identified as an *innovative model*, and reference is

made to another white paper entitled *Innovation Opportunities in EMS*. The Federal

Interagency Committee on EMS Strategic Plan serves as another example which

recognizes and promotes the future of community paramedicine within a federally funded

publication (Federal Interagency Committee on Emergency Medical Services, 2005).

HRSA: Community Paramedicine Evaluation Tool

The DHSS Health Resources and Services Administration (HRSA) published an

evaluation tool entitled *Community Paramedicine Evaluation Tool* in March 2012 in

special consideration for the Office of Rural Health Policy. The document refers to the

Rural and Frontier EMS Agenda for the Future as a foundational instrument which

defined community paramedicine as an organized system that is integrated within the

local healthcare system and provides services based on community needs. The evaluation

tool lends to the recognition of the various models of community paramedicine, as well

as the need to customize each program to best suit specific needs of the community. The

projected ambiguity is addressed through the creation of benchmarks serving as a

common framework. The evaluation tool can also be used for urban programs, and while

it is intended for existing programs, it can also be used as an assessment tool for future

programs.

EMS Trade Magazines

While numerous publications devote to EMS and prehospital professionals, this

review will recognize two specifically: *EMS World* and the *Journal of Emergency*

Medical Services, which both have published copious articles dedicated to the subject.

Most notable of efforts was a yearlong series published by EMS World, which addressed

different aspects of community paramedicine and related programs beginning with the

January 2015 edition. Monthly topics included:

- Strategic Planning for rapid implementation

- Data metrics and strategic goals

- Updates on CMS Innovation Grants

- Collaborations with home healthcare

- Accreditation of MIH programs

- Profile of the MIH Summit at EMS on the Hill Day

- Choosing the best candidates to be MIH practitioners

- Payer perspectives for MIH services

- MIH programs in rural settings

- International models of MIH

Legal Pathway to Implementation

Tennessee EMS Board: Task Force on Mobile Integrated Healthcare

Below is a sequential listing of Tennessee EMS Board Task Force meetings on

Mobile Integrated Healthcare and the current availability of meeting minutes as of date:

- June 30, 2014 @ 10:00AM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

o August 25, 2014 @ 11:00AM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- November 03, 2014 @ 12:00PM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- December 15, 2014 @ 12:00PM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- February 02, 2015 @ 12:00—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- March 09, 2015 @ 12:00PM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- April 13, 2015 @ 12:00PM—Iris Room 665 Mainstream Drive, Nashville, TN (minutes published)

- February 02, 2016 @ 10:00—Iris Room 665 Mainstream Drive, Nashville, TN

- March 14, 2016 (minutes unavailable)

Tennessee Legislature Affecting Community Paramedicine

SB 1161 by Senator Joey Hensley (R) Senate District 28 (Giles, Lawrence, Lewis, Maury, Perry, & Wayne counties). Medical occupations:

As introduced, requires the Tennessee Emergency Medical Services Board to study, on or before, January 31, 2018, the practice of mobile integrated healthcare by emergency medical services personnel and its relationship to community paramedicine and report its findings and recommendations to the health and welfare Committee of the Senate and the Health Committee of the House of Representatives – Amends TCA Title 68, Chapter 140. (Hensley, 2017)

The bill was last updated as being assigned to the General Subcommittee of Senate Health & Welfare Committee on 03/16/2017.

HB 1214 by Representative Antonio Parkinson (D) House District 98 (part of Shelby County). The bill is linked to Medical Occupations and shares same language as SB 1161. The bill was last assigned to s/c Health Subcommittee on 02/15/2017.

SB 1276 by Senator Mark Norris (R) Senate District 32 (Tipton County and part of Shelby County). MEDICAL OCCUPATIONS: As introduced, authorizes the Tennessee Emergency Medical Services Board to establish standards for mobile integrated healthcare through promulgation of rules; defines 'mobile integrated

healthcare' as the provision of healthcare using patient-centered, mobile resources in the out-of-hospital environment – Amends TCA Title 68" (Norris, 2017). The bill was passed on second consideration and referred to Senate Health & Welfare Committee on 02/13/2017.

HB 1272 by Representative Dwayne Thompson (D) House District 96 (part of Shelby County). The bill is linked to SB 1276 and shares the same language. It was last assigned to s/c Health Subcommittee on 02/15/2017.

SB 1270 by Senator Mark Norris (R) Senate District 32 (Tipton and part of Shelby County) HEALTH CARE—AMENDED: Adds to the Emergency Medical Services Board the power, responsibility, and duty to establish standards for a community paramedic through promulgation of rules pursuant to the Uniform Administrative Procedures Act, compiled in Title 4, Chapter 5. Authorizes EMS personnel and physicians on the scene to provide mobile integrated health care by means of community paramedicine, including non-emergent care and transportation by ambulance, in addition to care that constitutes EMS as defined in Tenn. Code Ann. 68-140-302" (Thompson, 2017). The bill, linked with HB 1271, became Public Charter #370 on 05/22/2017.

HB 1271 by Representative Dwayne Thompson (D) House District 96 (part of Shelby County). The bill is linked to SB 1270 and respectfully shares the same language. The bill was signed into law by Governor Bill Haslam on 05/11/2017 and assigned Public Charter #370 on 05/22/2017.

Literature Emerging During the Study

Among literature emerging over the past several years are two dissertations and a master's thesis, which directly pertain to mobile integrated healthcare/community paramedicine. A central commonality among all three studies is that each evaluated aspects of existing community paramedicine programs. A brief synopsis of each program is provided in the following text.

Queen Anne's County MIH program. In a dissertation effort, Scharf (2017) used data from a mobile integrated community health pilot program in Queen Anne's County, Maryland to study diagnosis prevalence and comorbidity of participants enrolled in the MIH program. The study focused on frequent 911 use and ED overcrowding. Finding from the study revealed that 94.85% of participating patients were comorbid, with an average of 5.88 diagnoses per each patient (Scharf, 2017).

Green Valley Fire District MIH program. The Green Valley Fire District in Green Valley, Arizona sponsors a nurse practitioner MIH program entitled Fire-Based Urgent Medical Service (FBUM), which was launched in March 2015. The program features licensed nurse practitioners and an NP hotline that can be called as an alternative to calling 911. In a DNP project, Spera (2018), evaluated FBUM's success at decreasing ED visits for low acuity patients. Findings from the study revealed that 90.9% of participants called the NP hotline as opposed to calling 911 (Spera, 2018).

Mesa Fire & Medical MIH program. Mesa Fire & Medical Department, located in Maricopa County, Arizona, sponsors a mobile integrated healthcare program aimed at diverting low acuity patients away from EDs. Green (2018), in her DNP project, studied

aspects of another advanced practice MIH program geared toward ED overcrowding. Findings from the study revealed that the program had resulted in 64.3% of patients being successfully diverted to more appropriate facilities (Green, 2018).

Summary

In observation of over three decades of EMS operations, the NHTSA offered its reflection upon the experiences learned and presented a new vision for the future of EMS in the1996 *EMS Agenda for the Future.* An overarching theme, which has been echoed time and again in subsequent position papers, is the necessity for EMS integration into the broader healthcare system. Community paramedicine is frequently offered as the catalyst for reaching that goal. Perhaps EMS has longed for this specific acceptance since inception, and for many years now, the vision has remained unwavering. Community paramedicine is no whim or fad, it has been deemed vehemently as a destination, but is it an obtainable aspiration amid a host of varied obstacles?

Nationally, there are over 100 community paramedicine programs in 33 states (NAEMT, 2015), and Tennessee has recently made significant strides toward implementation by passing state legislature allowing for the formation of community paramedicine standards. While on the state level community paramedicine is well into the implementation stage, it remains in the knowledge and persuasion stages of the innovation-decision process among the policy makers that would develop and implement programs. Furthermore, even if decision makers hold favorable opinions of community paramedicine, it is feasible, in lieu of guaranteed reimbursement, that many may choose not to adopt programs, in what Rogers (2003) referred to as the knowledge-attitude-

practice gap, or KAP-Gap, a phenomenon suggesting that favorable attitudes toward an innovation do not always result in adoption.

Because concepts such as the KAP phenomenon and the pro-innovation bias, as well as other precluding factors, are likely to influence the adoption of community paramedicine programs in Tennessee, more research is needed to identify likely barriers. This study specifically addressed existing and anticipated obstacles as viewed by potential adopters, therefore fulfilling a significant gap in the existing literature, as such subjectivity and relative bias had yet to be considered to a suitable extent. Chapter 3 includes the theoretical framework and methodology used to explore the adoption of community paramedicine programs in Tennessee.

Chapter 3: Methodology

Introduction

The purpose of this qualitative case study was to explore the willingness and intent among EMS leaders and other policy makers to adopt community paramedicine programs in Tennessee. I focused on identifying barriers that may affect adoption of programs, including tangible barriers and the attitudes, opinions, and political positions of key decision makers. In the study, I recognized the concepts of the pro-innovation bias, which assumes that an innovation should be adopted holistically within a given social system and without reinvention. Also, perceptions of the knowledge-attitude-practice (KAP) gap were recognized as they apply to the innovation decision stage, as favorable attitudes toward an innovation are no guarantee of adoption (Rogers, 2003).

This chapter includes a restatement of the research question as well as central concepts of the study as they related to the chosen research design and methodology. Other parameters, such as research tradition, disciplinary orientation, and design classification, were identified, as well as supporting rationale and the role of the researcher. Any perceived biases and relevant ethical considerations were identified. The design of the study, including the target population, sampling strategies, instrumentation, and procedures will also be disclosed. The strategy for data collection and analysis is presented in detail, including issues of validity, dependability, and confirmability. Ethical procedures such as the IRB process and other ethical concerns and participant protection are discussed at length.

Research Design and Rationale

The overarching research question was used to explore existing opinions, attitudes, and beliefs among key policy makers regarding the adoption and diffusion of community paramedicine programs in Tennessee.

Central concepts, such as pro-innovation bias, the KAP gap, relative advantage, the S curve, and binary logic, will be discussed as they apply to the topic. The study was qualitative in nature, structured as a case study, set in sociological orientation, and contextually situated within the physical setting with an exploratory design, collective, multi-sited, and intrinsic, with an embedded approach toward data analysis. In addition, the study included traits of anticipatory research and prospective policy analysis. Parallel to theory, a pragmatic application allowed for a naturalistic, real-world query into existing problems and possible barriers through open-ended questioning aimed at soliciting the expertise of seasoned EMS professionals and policy makers.

In respect to methodology, and in support of rationale, the answers sought within the research project existed beyond the realm of quantitative inquiry. Key insights were pursued through exploring the opinions and attitudes of decision makers. Creswell (2007) suggested that understanding phenomena involves the study of a culture-sharing group and their shared ideas and behaviors. EMS leaders and policy makers frequently belong to different culture-sharing groups, which further augments the need for a profound understanding as program success is contingent on collective agreement.

Rogers (2003) also postulated the importance of group behavior, which he referred to as a *social system,* which is defined in diffusion research as a set of

interrelated units working toward a common goal. While the ethnographic approach is preferred for group study, it is important to understand that members of these groups do not exist within a single physical setting where behavior and participant interaction could be easily observed. Furthermore, community paramedicine programs do not yet exist in Tennessee, and therefore any study of applicable behaviors within the physical setting is irresoluble.

In contrast, the case study is delineated by a bounded system of time and place, which by design is less restrictive and not dependent on behaviors observed in a specific physical setting. In fact, the case itself, by definition, is a unit of measurement (Patton, 2014) and is quite unconstrained and may even be a program, event, or activity (Creswell, 2007). The case study tradition provides the necessary mobility and depth required to explore research questions to an exhaustive extent. Patton (2014) suggested that case studies can produce a more applicable interpretation and often allot a deeper understanding of the situation. Patton (2014) further stated that the case study approach is particularly valuable when evaluating variations between similar programs and can also extract rich data from a limited number of exemplars.

Role of the Researcher

Foremost, I made all inquiries as a single researcher. Such inquiry is inherently hermeneutical and subject to certain ethical considerations, such as personal bias and past experiences. Creswell (2007) suggested that qualitative research, by nature and design, is interpretative and that researchers engaged in such inquiry should disclose specifics of their backgrounds that may affect the study.

As prescribed by Creswell (2007), the following is offered as an open disclosure: I am a man currently affiliated with EMS as a licensed paramedic provider in the state of Tennessee. I have been in the field since 2002 and have previously served for 2 years as a county service director within the state, at which time I considered creating a community paramedicine pilot program. However, during that short tenure, such opportunity was thwarted by a lack of state legislation allowing providers to function in the role of community paramedic. Since leaving the capacity of service director, and as this study has progressed, I have developed a more unbiased perspective and no longer possess a position of advocacy, power of influence, or the ability to pursue the development of a community paramedicine pilot program in Tennessee.

In addition to acting alone in conducting all research activities, I served only in the role of interviewer, having no participatory role in the research itself, and because community paramedicine programs do not currently exist in Tennessee, it was assumed that no benefit would result from researcher participation. While the right to collect observational data and field notes was reserved, no such data were collected due in part to a lack of opportunity, as no pilot programs emerged during data collection.

In summary, no power relationships existed between myself, as the researcher, and any of the participants. All biases were addressed accordingly, as the overarching goal was to explore the true opinions, attitudes, and unique positions of participants without researcher influence. To further safeguard against ethical concerns or possible conflicts of interest, no research was conducted in organizations where there exists a position of influence, real or implied, or that could have questionably posed a threat to

the integrity of the research. Employment in a nonmanagerial position, such as in the role of paramedic, was excluded as no direct influence upon decisions may be implied.

Methodology

The qualitative case study supported an opportunistic approach and the population included selected individuals having influence over the decision to adopt programs, possessing valuable knowledge and expertise, or holding opposing viewpoints that may impact final decisions. A target population consisted of EMS leaders, such as service directors and other decision makers, within both public and private organizations across the state, but also included public policy makers, such as county mayors, ER physicians, and others possessing potential influence over the decision to adopt community paramedicine programs in Tennessee.

The study applied a purposeful sampling strategy to ensure valuable, information-rich cases wherein the benefit of in-depth study would advance the current knowledge of the subject and fill necessary gaps in the literature. Patton (2014) suggested that the logic behind purposeful sampling is the selection of cases that will elucidate specific research questions. For example, in this study, it was necessary to purposefully select possible early adaptors to ensure inclusion of pro-innovation bias and to include opposing opinions among laggards and others existing at various points along the adoption continuum.

According to Patton (2014), existing heterogeneity among small samples may be troublesome due to contrasting variations. Similarly, Rogers (2003) described homophily and heterophily communications, stating that some degree of the latter is necessary for

diffusion to occur, but ideally and aside from the innovation itself, diffusion success is largely reliant on similar beliefs within a given social system. Such is the case in EMS, as the unique culture within the field cuts across societal and geographical boundaries, providing a familiar foundation of general understanding among members. However, while most participants in the study possessed a basic knowledge of community paramedicine, there were different levels of interest pertaining to the adoption of such programs.

In the study, I employed a maximum variation sampling strategy in an effort to not only uncover the uniqueness of individual participants and their respective organizations, but also to identify emerging themes. According to Patton (2014), the use of maximum variation sampling in small samples alters the disadvantage of heterogeneity into an advantage, as collective patterns or themes emerging amid variations may be of value. In further support of this rationale, Creswell (2007) stated a preference for using maximum variation sampling in case studies, as the strategy, by design, illuminates existing diversities. There are 95 counties in Tennessee; each is responsible for providing EMS services to its citizenry, and thus, a wide range of perspectives concerning community paramedicine was anticipated. Patton (2014) stated that among samples of great diversity, data will not only yield detailed accounts of individual cases, but also any shared themes emerging from heterogeneity.

The criteria for which participants were selected varied due to the opportunistic nature of the research design. However, all participants retained either a position of influence in the decision to adopt community paramedicine programs in a state or local

capacity or possessed a specific knowledge or opinion that is of pragmatic value.

However, participant selection was conducted in a tiered fashion, with EMS directors,

managers, and other decision makers being the first chosen within geographical regions.

A second tier included elected officials having influence over policy decisions. A third,

opportunistic tier proffered a chain sampling approach designed to expand the research

project to include cases and participants possessing additional knowledge relevant to the

study. Such participants included ER physicians, primary care providers and home health

professionals, each holding valuable opinions or expertise that contributed to the data in

what Patton (2014) referred to as a *snowball effect*.

Each participant stated his or her *position of influence*, which was verified to

satisfy criterion parameters. However, such positions were not identified in transcripts,

nor solicited in interviews. Furthermore, specific locations of participants, and other

information which could reasonably threaten exposure of identity or otherwise jeopardize

the privacy of participants was redacted from transcripts. In the case of chain sampling of

external stakeholders, the same principles and protections applied, as only the

participant's *position of opinion* was identified. The two specific categories: *position of*

influence and *position of opinion*, served to identify participants as being either internal

or external participants. In efforts to promote validity and to ensure the integrity of the

study, all participants and their positions were verified to a reasonable extent.

The study was confined to the state of Tennessee, which is divided into 95

separate governing counties. The state is further divided into eight EMS regions that

mirror the Tennessee Healthcare Coalitions as prescribed by the Tennessee Department

of Health, with the difference being the later refers to the regions by specific name instead of by numbers. In efforts to avert possible confusion, the following is a list of regions with coinciding names and numbers:

- Region I: Northeast/Sullivan (8 counties)

- Region II: Knox/East Tennessee (16 counties)

- Region III: Southeast/Hamilton (11 counties)

- Region IV: Upper Cumberland (14 counties)

- Region V: Tennessee Highland Rim (13 counties)

- Region VI: South Central (12 counties)

- Region VII: Region Seven (17 counties)

- Region VIII: Midsouth (4 counties)

Figure 1 is a graphic representation of each region and its geographical location within the state.
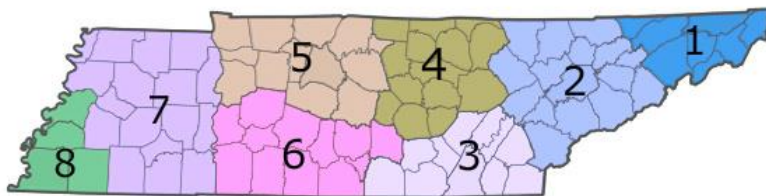

Figure 1. Tennessee state EMS regions map.

Within each region exist municipalities of differing populations and civic healthcare needs. Because community paramedicine, as a collective discipline, avers some degree of benefit to communities of all sizes, it was necessary to include cases which represented a range of different population compositions. However, past research

and existing pilot programs have largely focused on the fringes of rural and urban

communities, and much of the subsequent data can be classified as exclusively belonging

to one of the two distinctions. Therefore, a preference for rural and urban cases of

specific merit, or those representing a unique circumstance or need, were deemed as

critical cases subject to sampling. While the U.S. Census Bureau considers such factors

as population thresholds, density, land use, and distance in classifying populations as

either rural or urban, this study will consider county populations and use specific

numbers to classify each case as either rural, urban, or suburban. Urban is a total county

population exceeding 100,000; suburban is a total county population between 25,000-

99,999; and rural is total county population less than 25,000 (U.S. Census Bureau, 2020).

In efforts to keep the sample size manageable for a single researcher, the base

structure for participant selection underwent a process to initially select at least one

participant from each of the eight regions, as well as selecting participants representing

both urban and rural locations and populations of various size and service delivery

structure, either government operated or private. However, with an overall opportunistic

theme, sampling strategies such as *maximum variation sampling*, *critical case sampling*,

and *chain sampling*, were used. The rationale behind using multiple sampling strategies

was to achieve *methodological triangulation*, one of four strategic research paradigms

identified by Patton (2014), designed to strengthen qualitative studies through the mixing

of purposeful samples strategies.

The sample size previously prescribed served as a minimum number to ensure

that all eight Tennessee EMS regions were included in the study. The overarching goal of

the methodological triangulation strategy was to expand upon the base sample size in an opportunistic and emerging fashion, seeking information-rich and diverse cases that would yield in-depth data. While it was anticipated that some participants would have limited knowledge of community paramedicine, others were expected to have vast knowledge of the subject. By design, the study was exploratory in nature, and contrasting viewpoints were expected to emerge. While information-rich cases from informed participants provided valuable data, certain cases were subject to pro-innovation bias. Therefore, expanding the sample size to include less informed participants, while yielding less depth, disclosed a wider range of opinions which were useful in understanding existing diversities (Patton, 2014). In this study, the maximum sample size allotted by the committee methodologist was 24.

Instrumentation

The instrumentation used in the research was limited due to a design largely reliant on the interview process. Interviews were conducted and recorded via electronic audio recording applications and an interview protocol was be developed and structured as follows:

- Topic guide

- Enrollment and consent forms

- Introduction

- Interview

- Data entry and handling

- Transcription, coding, and analysis

- Ethics statement

- Quality assurance

A collection of historical documents, such as white papers, position papers, published agendas and other items previously referenced in Chapter 2, were used as data sources. The reputability of such items is often internal, appearing in respected trade magazines such as *The Journal of Emergency Medical Services* and *EMS World*. Other examples include position papers and agendas which are familiar to industry insiders, such as the original EMS white paper, *Accidental Death and Disability: The Neglected Disease of Modern Society,* published by the National Academy of Sciences in 1966, and the more recently published and more applicable, *Innovation Opportunities for Emergency Medical Services*, a draft white paper published by the Department of Transportation and the DHHS in 2013. Also, the four specific agendas mentioned in Chapter 2, *EMS Agenda for the Future, Rural and Frontier EMS Agenda, EMS Education Agenda, and EMS Workforce Agenda* were considered, as each exist as benchmark pillars within the EMS industry.

The DHHS Health Resources and Services Administration's (HRSA) Community Paramedicine Evaluation Tool was published in 2012 and was largely incited by the content and vision embodied in the *Rural and Frontier EMS Agenda for the Future*, published in 2004. The publication identifies an absence of established benchmarks and performance indicators within the United States and proposes community specific system design based on intrinsic needs. Because community paramedicine is so closely linked to

broader public health themes, the evaluation framework selected mirrors terminology and concepts familiar to public health (DHHS, 2012), as exemplar in Figure 2:
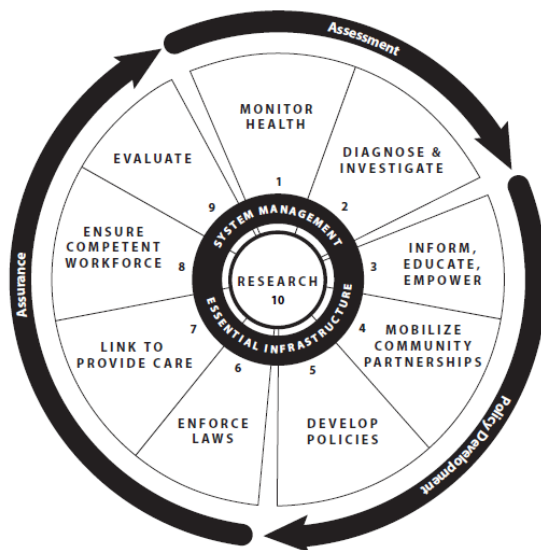
Figure 2. HRSA public health model.

The evaluation tool can be used by either rural or urban agencies interested in evaluating existing community paramedicine programs. However, the evaluation process can also be used as a planning tool for aspiring agencies seeking to create new community paramedicine programs. Since there are no existing community paramedicine programs in Tennessee, the later purpose of the evaluation tool was used in this research project, as participants were asked if they were familiar with the application and if they had previously used it as part of a community needs assessment.

It is unknown if the evaluation tool has been previously used as a research instrument, either in whole or in part, or if it has been used in other capacities associated with research processes. However, by viewing questions through a future-tense lens, the evaluation tool can be transformed into an assessment tool, aligning it with a significant

level of appropriateness, as many of the questions brought forth within the evaluation tool are pertinent, such as questions regarding community needs assessments, stakeholder collaborations, EIS database systems, and internal and external resource systems. The evaluation tool was not used in the study because it was largely unfamiliar to participants. However, for future purposes, public use of the evaluation tool is preauthorized through a statement of public domain, with subsequent reproduction of material welcomed upon source citation (DHHS, 2012).

While the assessment tool was ultimately not used in this study, it remains the gold standard for measuring the success of existing community paramedic programs in the United States. Therefore, as it may contribute to awareness, certain aspects of the assessment tool have been retained in the final study, including the scoring chart, as seen in Table 1. By design, the tool is objective in nature and uses a 0-5 chart to score each benchmark assessment.

Table 1

HRSA Scoring Chart

Score	Progress scoring
0	Not known
1	No
2	Minimal
3	Limited
4	Substantial
5	Full

The scoring chart represented in Table 1 is used throughout the evaluation tool to quantify benchmarks in three broad topic areas: a*ssessment, policy development*, and *assurance*. However, in scoring the indicators (benchmarks) for aggregate scores or mean

averages, the authors offer no options for grading cumulative scores and refer to the process itself as being subjective in nature. Furthermore, as expressed within the limitations, the evaluation tool holistically relies on the individual opinions of those completing the assessment (DHHS, 2012).

While there are numerous models that have been used to measure diffusion of innovations within the United States, this study used the internal determinants model. Popular adaptations of this model are recurrent in the field of public health and are often designed to measure individual behaviors rather than those of organizations or government entities. Prevailing theories used in government innovation research have been modified from original models designed to measure the behavior of individuals, including Everett Rogers's diffusion of innovations and the famed *S-curve,* for which the national interaction model exemplifies (Sabatier, 1999). Therefore, because Tennessee has already adopted community paramedicine on a state level, and it is the adoption and diffusion among individual counties and communities that is relevant to this study, the model used reverted to one that explored the individual behaviors and attitudes of perspective decision makers.

Data Collection and Analysis Plan

Data were collected primarily through participant interviews conducted within the natural setting. While some data were retrieved from published materials, the majority were collected within the geographical boundaries of the state of Tennessee, subdivided into eight specific regions, as defined by the Tennessee Department of Health, and further subdivided into the local communities that were outlined by individual participant

jurisdiction. Data were collected in various venues, to include telephone communications, but also included personal offices, conference rooms, and other non-specific areas which were deemed suitable by all parties. All data are considered confidential unless otherwise specified.

All data were collected by the researcher, including all interviews. A single interview, either by telephone or in person, was conducted with each selected participant, with interviews scheduled for a maximum duration of 1 hour. However, duration times varied, but all interviews were completed within the allotted period. Subsequent interviews were deemed unnecessary, and member checking was conducted via email. Data were collected using electronic audio recording devices, to include a cellular phone and an electric recording app. All raw data were appropriately converted and stored on flash drives, which will be maintained in a safe deposit box for a period of 5 years, and at which time, will be destroyed. Furthermore, all electronic files, both audio and written, will be securely stored on a password protected computer throughout the data collection process and for a period of 5 years. All data were considered confidential.

No deviation in the data collection plan arose, and subsequently, the planned sample size was not altered through any participant cancellation. However, only seven of the eight EMS divisions were represented, as no participants emerged from one of the regions despite the use of alternative sampling strategies. Following the conclusion of the data collection period, a letter of exit and debriefing instructions was forwarded to each participant via email.

All data were linked to the corresponding interview questions and subjected to the process of a selected coding procedure and analysis using NVIVO software programming. In addition, matrices, charts, and graphs, including the signature S-curve, were used to present various information. An adaptation of the ladder of analytical abstraction was used to organize, synthesize, and present data in a more valid format (Miles & Huberman, 1994).

1. Summarizing data (packaging data): Transcribing audio to text, synopsis of interviews, forming coding categories, coding of data, linking data to frameworks.

2. Aggregating data (repackaging data): Identifying themes, locating emerging trends, emphases, and potential gaps in data.

3. Synthesis: Developing propositions, constructing explanatory framework, cross-checking, matrix analysis of major themes, synthesis, and integration into explanatory framework.

Issues of Trustworthiness

Metaphysically speaking, the researcher holds a fundamental worldview most closely related to social constructivism, in which Creswell (2007) expressed the propensity of constructivists to value complexity over simplicity, and an ensuing reliance on participant subjectivity. In addition to the *ontological* and *epistemological questions*, Guba and Lincoln (1994) identified a third question: The *methodological question*, which addresses the appropriateness of different methodologies in relation to specific worldviews, or paradigms. It was also suggested that a high level of hermeneutical inquiry can only be developed and realized through interactions between the investigator

and participants. With the philosophical and methodological choices duly substantiated, and the need for a hermeneutical approach recognized, there are four standard criteria for measuring the trustworthiness of qualitative research efforts: *Credibility, transferability*, *dependability*, and *confirmability* (Guba & Lincoln, 1994).

Credibility

Qualitative research is naturalistic because it is unmanipulated by the researcher and entails a natural validity that is guileless and transparent, and without the presence of researcher influence (Miles & Huberman, 1994). The overarching aim of this research project was to explore the opinions and beliefs of individual participants, and to do so without offering influence of any kind. In addition to natural validity, which was assumed to be inherent, several modes of triangulation were employed to further strengthen credibility. Data triangulation emerged as different applications were introduced. Methodological triangulation also occurred through opportunistic sampling, in which the purposeful sampling design included chain sampling, critical case sampling, and maximum variation sampling.

Because credibility is contingent upon participant perspective, and that such individual perspectives should remain uncontrived and transparently conveyed (Guba & Lincoln, 1994), the use of member checking was used to strengthen credibility. Sample saturation was a target goal which efforts continued until such a point where no new information was being unveiled and participant responses became redundant (Patton, 2014). Reflexivity was also a key component in the research process, and a reflexive

journal was maintained by the researcher. serve as philosophical benchmarks aimed at ensuring an open-minded approach.

Transferability

To ensure external validity, or transferability, measures of theoretical validity, such as abstract explanations, are specifically useful if connected to existing external theory (Miles & Huberman, 1994). Participant responses provided examples of data relevant to existing diffusion studies, as well as other theories, processes, and models used in evaluating the adoption of federal and state government programs in the United States and abroad. By using open-ended questions and an extended invitation to contribute in-depth and detailed responses, the use of *thick description* was solicited and encouraged during the interviewing process. The aim was to obtain enough thick description from participants to ensure potential transferability (Miles & Huberman, 1994).

The use of chain sampling in initial inquires was also instrumental in identifying key informants that identified critical cases (Patton, 2014). Clearly, some opposition, or at least skepticism among adopters was anticipated. Therefore, it was necessary to identify cases which existed beyond the pro-innovation bias, and beyond the elite group known as innovators, which represent only 2.5% of the population (Rogers, 2003). As prescribed, the innovators were those participants interested in creating community paramedicine pilot programs and are exemplar of the pro-innovation bias.

A total of five adopter groups exist: innovators (2.5%), early adopters (12.5%), early majority (34%), late majority (34%), and laggards (16%). Subsequently, there is a

phenomenon in extended diffusion research known as *crossing the chasm*, in which a diffusion gap exists between the first two groups (innovators and early adopters) and the following three groups (early majority, late majority, and laggards). It was deemed necessary to identify adopters existing within the first 15%, which constitutes the early market, and those existing among the following 85%, on either side of the chasm, respectfully. Blending the use of critical case sampling with maximum variation sampling ensured representation from each of the broader adopter categories, as well as the inclusion of the chasm phenomenon, which explored the extent to which community paramedicine is viewed either through the pro-innovation lens, or as an unsustainable or disruptive innovation.

Dependability

Again, triangulation was used to strengthen dependability as well as credibility. Community paramedicine in Tennessee is in a progressive state and is subject to the influences of policy as well as popularity. For example, new legislation has emerged during the writing of this proposal, with future progress forthcoming, and likely contingent upon broader adaptations of healthcare delivery on the national stage. Therefore, it was necessary to identify any emerging changes or influence on participant input. The aim of dependability was realized through a commitment to awareness, and to the timely provision and inclusion of applicable up-to-date information as it unfolded.

Confirmability

It has been suggested that perhaps the best path to confirmability is gained through sharing results with the participants themselves. Furthermore, soliciting feedback

from participants ensured that data retrieved was genuine, and that no misunderstandings or misinterpretations existed, which increased the plausibility of the study. A second strategy toward confirmability involved the mitigation of personal researcher biases, as well as elements of triangulation were used to further strengthen objectivity and confirmability (Hancock & Algozzine, 2006).

An overarching theme of confirmability is that research findings and conclusions need to reflect that of the inquiry, as opposed to that of the inquirer (Guba & Lincoln, 1994). To ensure objectivity, methods of the study were explained in detail to each participant, as well as the process of data collection. Furthermore, the methods and procedures used in the study have been documented in detail and verifiable through an audit trail. All data and related documentation will be retained for future reference and analysis for a period of 5 years, at which time it will be destroyed (Miles & Huberman, 1994).

Ethical Procedures

All EMS participants were initially contacted through their respective organizations using public means. However, certain participants emerged through the chain sampling process, and were contacted directly through means provided. Invitations to participate in the research project were sent by U.S. Mail and included a consent form, in which upon return, documented a signed willingness to participate in the research project. By the nature of design of this research project, participants were not expected to belong to a protected class or vulnerable population, as they were identified as high-ranking EMS or government officials charged with some degree of decision-making

influence. Furthermore, ethical research standards were adhered to as they applied to the study of human participants. In addition, all institutional and IRB requirements were met as prescribed, with inclusion of the documents mentioned above, as well as other permissions and approvals that were necessary to conduct the research project (Walden IRB 02-15-19-0384394).

<div align="center">**Summary**</div>

The overarching goal of this research project was to explore the opinions, attitudes, and awareness of the topic among participants, and to construct an attempt to gauge the willingness and readiness of potential leaders to adopt and implement community paramedicine programs in Tennessee. A detailed plan and methodological strategy have been documented within this chapter, to include relevant methodology, population sample size and inclusion criteria, as well as data collection and analysis strategies. Ethical standards and protection of participants and privacy have been checked using the university's forty-question Research Ethics Planning Worksheet, which mirrors the criteria needed for IRB approval. The methodologies, strategies and research plan described within this chapter was carried out as specified. Results of the study will be presented in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this qualitative case study, as aligned with Rogers' diffusion of

innovations theory, was to explore the willingness and readiness of EMS leaders and

other external decision makers to adopt community paramedicine programs in Tennessee.

A single overarching research question probed the opinions, attitudes, and beliefs of key

policy makers, both internal and external, regarding the likelihood of adoption and

diffusion of community paramedicine programs, as specifically applied to and limited to

the state of Tennessee. This research, subsequent analysis, and completion of this

dissertation project predates the rollout of community paramedicine pilot programs in the

state. Some pilot programs are reported to be close to induction, but implementation of

such programs remains forthcoming. This chapter includes a description of the setting

where data were collected, demographic considerations, and participant characteristics as

deemed relevant to the study. Data collection and analysis techniques are explained, as

well as aims at trustworthiness and validity.

Setting

As prescribed in Chapter 3, the study included all eight EMS regions in the state

of Tennessee, and such dispersal of participants rendered it necessary to conduct some

interviews via telecommunications. A total of 21 interviews were conducted; 10 were

conducted in person, and 10 were conducted by telephone, and one interview was

conducted in two parts, the first by telephone and the second in person. All interviews

were conducted at a time selected by the participants, and all participants agreed to the

audiotaping of interview sessions, as stipulated in the consent form. Interviews conducted in person were held in locations, such as personal offices, conference rooms, or in other private areas, agreed upon by both parties. Privacy was presumed during telephone interviews, as locations were selected by individual participants.

Demographics

A total of 102 invitations were sent via U.S. mail to EMS services across the state, including every 911 emergency EMS provider from each of the state's 95 counties. All contact information was obtained from the Tennessee EMS website. In addition to EMS services, other external stakeholders were also approached, including county mayors, ER physicians, primary care physicians, home heath administrators, hospital administrators, and billing professionals. In rural and suburban areas, the EMS director was typically the decision maker regarding the adoption of community paramedicine programs. However, in larger urban areas, leaders were more often high-ranking officials other than service directors. External decision makers and other stakeholder professionals were selected based on either participant referral or availability. All participants claimed to be residents of the state of Tennessee. Figure 3 is a graphic representation of specific participant categories.
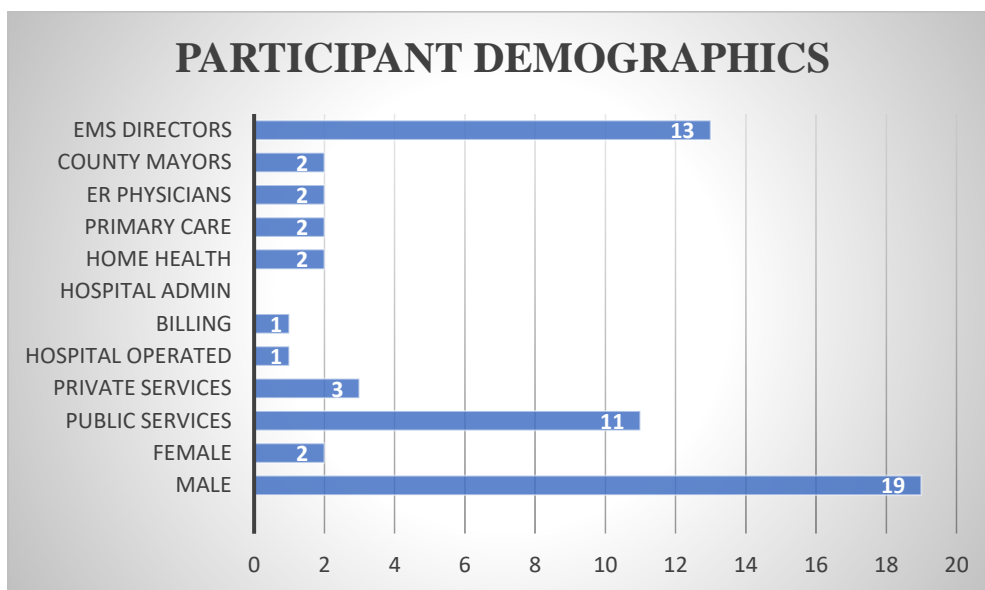
Figure 3. Participant demographics.

Data Collection

Personal one-on-one semi-structured interviews were conducted either in person

or via telephone with a total of 21 participants, representing seven of the eight EMS

regions across the state. Interview locations were chosen by participants, and in-person

interviews were largely conducted in a private area located at the participant's place of

employment. A single 1-hour interview was scheduled with each participant, and the time

allotted proved adequate to collect necessary data, as interviews were easily completed

within the 1-hour timeframe. Each interview was digitally recorded using a recording app

on a personal computer, and backup recordings were made using a smart phone. The

microcassette recorder prescribed in Chapter 3 was not deemed necessary and therefore

was not used.

The following figures depict participant involvement by population classification.

From those invited to participate, every respondent was granted approval and inclusion

into the study; the limited number of respondents did not warrant the use of a selection or elimination process. Therefore, the figures below offer an unbiased representation of raw interest from a population perspective, excluding one caveat, referrals were largely limited to the rural areas where I admit inclusion in a social network. Among EMS directors and high-ranking officials, four represented rural communities, five represented suburban communities, three represented urban areas, and one represented rural, suburban, and urban areas, for a total of 13 participants (as shown in Figure 4). Rural and urban community paramedicine programs differ greatly in their scope and purpose.
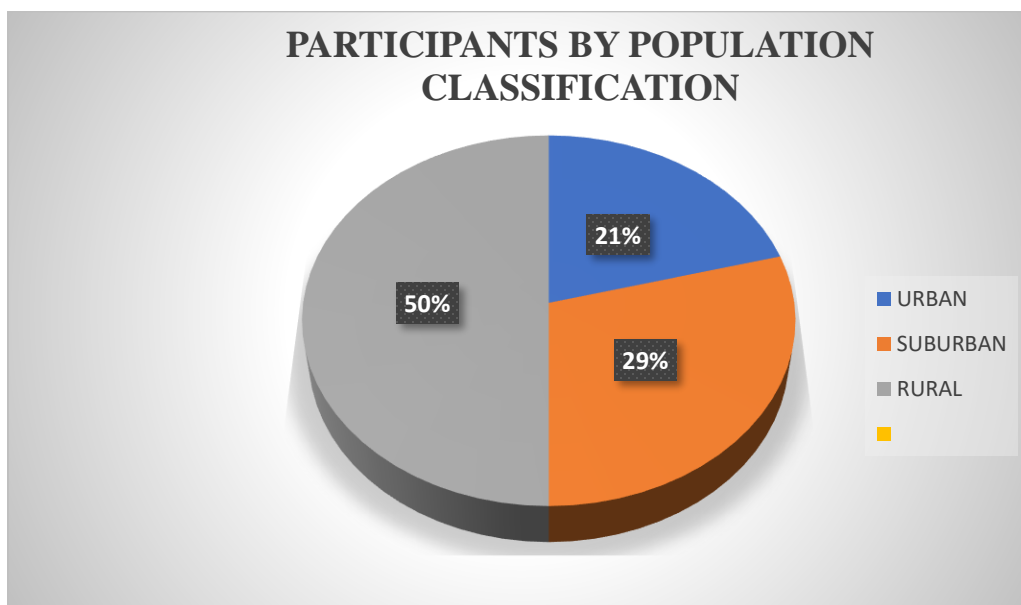
Figure 4. Participant population classification.
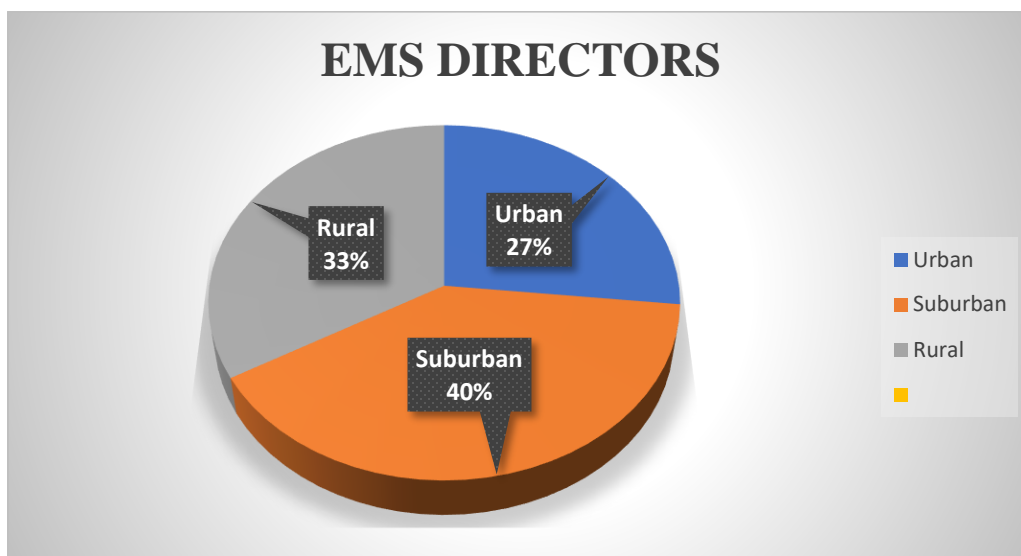
Figure 5. EMS directors by population classification.

No field notes or observational entries were made, as prescribed in Chapter 3, because interviews alone yielded no opportunity to collect such data, even where on-sight interviews were conducted, as no pilot programs currently exist. Only audio recordings were performed, and no visual recording occurred, as instructed by the IRB. Furthermore, participants appeared comfortable to conduct interviews via telephone rather than using Skype, Facetime, or other audiovisual media platforms. Another deviance from the original data collection plan was that member checking was conducted via e-mail, as this method seemed most appropriate; audio transcripts were e-mailed directly to participants for individual review. A final deviancy entailed using NVivo data analysis software as opposed to MAX QDA, which was discussed in Chapter 3.

One aberration occurred that could be considered an unusual circumstance, or at minimum a significant deviance concerning instrumentation. In Chapter 3 a considerable effort was made to present the DHHS Health Resources and Services Administration's (HRSA) Community Paramedicine Evaluation Tool and Public Health Model, as it is

considered the standard community assessment tool in the United States. However, among participant interviews, the HRSA community assessment tool was not used a single time in its entirety and was only used as a general reference by one organization. Therefore, the HRSA scoring chart, shown in Table 1, was not used as instrumentation or otherwise utilized as originally planned.

Data Analysis

Audio files of participant interviews were transcribed and saved as Word documents. A total of 136.75 pages of single-spaced data were derived from 21 participant transcripts. The data corpus was then uploaded into NVivo software for analysis. First-cycle coding efforts included a holistic content analysis that was an inductive process aimed at identifying emerging themes. Thirty-nine topics emerged and were recorded into specific categories that will be presented throughout this chapter as they relate to the broader emerging themes.

The second-cycle coding process included creating a discourse analysis and identifying main themes. Due to a need to combine initial codes into a more manageable and significant set of themes, I adapted a focused coding strategy (Saldana, 2009). Six major categories emerged from the initial coding process. Table 2 illustrates those six emerging categories, their frequency across all participant interviews, and the total number of references.

Table 2

Second Cycle Coding Themes

Second cycle coding	Participants	References
Financial/reimbursement	21	156
CP defined	21	405
Home health	19	96
Public health/access	21	351
Rural EMS/CP	19	47
Urban EMS/CP	16	50

In addition to, and coded separately through a deductive process, were responses to the five attributes applicable to Rogers' theory of diffusion of innovations: (a) relative advantage, (b) observability, (c) trialability, (d) complexity, and (e) compatibility. Twelve of the 13 EMS directors interviewed provided answers to questions related to these attributes, which Rogers (2003) described as characteristics of adopter perception having a direct correlation to rate of adoption.

Only one discrepant case was identified, as typically participants were either in favor of community paramedicine, neutral toward it, or against it; responses were somewhat similar, if not expected. However, Participant 2 provided responses that suggested that community paramedicine programs would lead to more hospital closures, especially in rural areas, and he referenced the financial instability of rural hospitals across the country. The case is listed as aberrant because of the uniqueness of responses provided by this participant. Participant 2 provided the following example:

A hospital like this one—it is tenuous at best and were you to—that the model that we're kind of thinking of here, you and I, would mean closing most of the rural hospitals in areas like this because, ideally, the goal of the program would

seem to be to divert nonemergent patients. In any hospital, whether you're in

[REDACTED] or [REDACTED], or New York City, the overwhelming

majority—90% of patients who are seen in ERs everywhere in the county are

nonemergent patients. So, if the model is to try to divert all those people to more

appropriate care, then you will probably close most hospitals in the country that

aren't inner-city hospitals.

Evidence of Trustworthiness

In terms of credibility, and through the pursuit of naturalistic inquiry, I maintained

my aim for natural validity through the unmanipulated structure of open-ended

questioning. As aforementioned, a specific deviance from the plan presented in Chapter 3

was that the HRSA assessment tool was not used in the capacity of data triangulation.

However, methodologically speaking, triangulation of the data occurred through

opportunistic sampling, particularly through critical case sampling, chain sampling, and

maximum variation sampling, as was prescribed in Chapter 3. In addition, I used member

checking to strengthen the case for credibility, and I achieved sample saturation prior to

the allotted number of interviews set forth by committee. I maintained a reflexive journal

throughout the process, although no peer review process was considered.

Again, the HRSA assessment tool was not used, and therefore was not considered

in achieving transferability. However, the aim for rich description was realized in many

individual transcripts, as well as collectively in the sum of data. The use of chain

sampling identified key informants, as prescribed, resulting in referrals to critical case

participants. As anticipated, opposition among potential adopters was recognized and

produced data uninfluenced by pro-innovation bias. A target goal for achieving transferability, as proposed in Chapter 3, was inclusion of participants representing different adopter groups: Innovators (2.5%), early adopters (12.5%), early majority (34%), late majority (34%), and laggards (16%). All adopter categories were represented. Figure 6 illustrates how participants placed among the five adopter groups recognized in Rogers theory of diffusion of innovations:
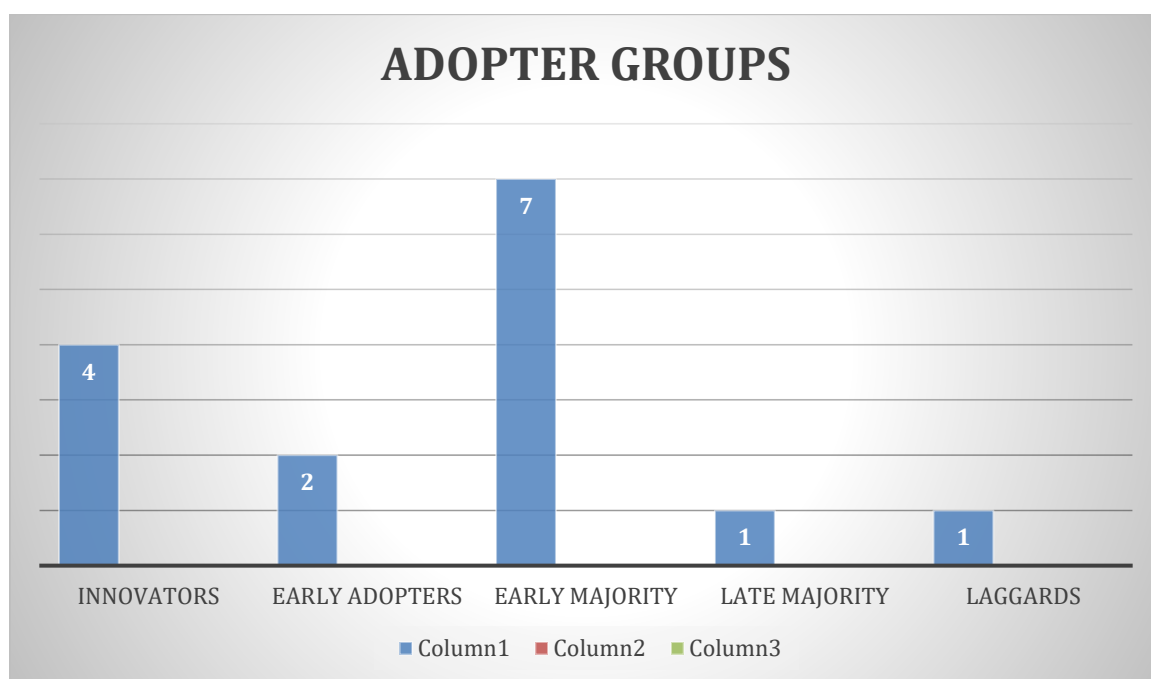
Figure 6. Adopter groups.

The timing of this study has been both uncanny and relevant, as the conclusion of data collection and the completion of the final dissertation predated the implementation of pilot programs in the state. As foreshadowed in Chapter 3, new legislation has indeed emerged and continues to reshape the future of EMS. The most significant revelation to emerge is the CMS announcement of its new voluntary 5-year payment test model, The Emergency Triage, Treat & Transport (ET3), which CMS claims will deliver the most

appropriate and applicable prehospital emergency medical care. Although CMS vehemently denies any connection between ET3 and existing community paramedicine models, the new ET3 model allows for reimbursement to EMS agencies for transports originating from 911 scene calls to destinations other than hospital ERs. The ET3 model was first announced at a fire hall in Washington D.C. on February 14, 2019, 5 days before the first participant interview was conducted. ET3 was discussed as a topic in many of the participant interviews and such inclusion serves as an example of the commitment to dependability held by the researcher. In addition, new dissertations have emerged since the writing of Chapter 2 and have been added to the existing literature review.

Member checking remained an essential strategy in achieving confirmability. Upon completion, transcripts were emailed to each participant and feedback was encouraged. Participants were also instructed to review transcripts for accuracy and further encouraged to make additional statements if deemed necessary. No topic experts were solicited as considered in Chapter 3. All data, including audio files, transcripts, and email correspondence has been preserved for future review.

Results

Because there is only one overarching research question, results are presented through the six emerging categories, or themes, produced during the second cycle coding process. The categories are presented here based on the total number of references included within both the parent and child nodes combined, as determined by the analysis software. Categories are listed chronologically based on the total number of references.

Community Paramedicine Defined

The definition of community paramedicine is arguably subjective, if not by design alone, as each individual community is encouraged to create programs that benefit the specific needs of their respective community. This theme was composed of ten first-cycle coding categories, which included responses from all 21 (100%) participants and resulted in 405 individual references. Table 3 illustrates the first-cycle coding categories which comprised the broader theme:

Table 3

Community Paramedicine Defined, First Cycle Coding

Community paramedicine defined	Participants	References
Telemedicine	8	21
Public perception	15	50
Paramedic skillset	8	19
Needs assessment	7	13
CP reception	7	17
CP pilot projects	13	27
CP models	17	69
CP implementation	12	31
CP education	10	27
CP defined	21	131

Public perception and understanding of community paramedicine programs are vital considerations which are applicable to Rogers' five attributes, as they pertain to the complexity and compatibility of the innovation. Most communication regarding community paramedicine has been contained within the social group, which is EMS, and no major efforts have served to extend communications to the general public. Therefore, innovation awareness and support may be low, which was a concern among certain participants.

Overall, 14 participants (67%) responded to the question of how well they thought community paramedicine would be received in the community. Participants 1, 9, 10, 12, 13, 18, and 19 (50%) felt that community paramedicine programs would be favorably received in their respective communities. Participants 6, 7, and 20 (21%) expressed mixed opinions on how they felt programs would be received, and Participants 5, 8, 14, and 15 (29%) felt that programs would not be well received. On the topic of public perception, Participant 18 provided the following representative response:

I see some initial isolated hurdles with individuals who may not be that receptive to it. But I think overall, locally, it will be very well accepted. And a lot of these folks don't want to access care in the way that that are now, but they don't feel like there are other options. Maybe we can offer them some other options that would be appropriate to help.

Participant 20 offered the following opinion, "I don't know, because I guess it's one of those—the way it's always been issues. Maybe a paramedic is more seen as a first responder in an emergency."

The topic of conducting a community needs assessment, such as the national HRSA Community Paramedicine Assessment Tool, was discussed by seven participants (33%). Four participants (19%) stated that a needs assessment had been conducted in their community, and one participant (5%) stated that a community paramedicine needs assessment was currently being conducted. Two participants (10%) stated that the needs assessment was conducted as a part of a larger community health project and was not primarily focused on community paramedicine. However, only two participants (10%)

claim to have used the HRSA model, but not in its entirety. It is unclear if anyone has completed the HRSA assessment tool, and therefore the tool was not used during the analytical portion of this study. Participant 4 offered the following statement concerning a community needs assessment:

> We weren't identifying certain groups to work on. We worked on those that were calling 911 too frequently and were overutilizing our services and worked to reduce their inappropriate use of 911 and connect them with a better resource. And, through that work, we found that behavioral health issues were big, so, we started addressing that in our work as well. That's why I say our needs assessment wasn't a huge document that we created, it was things that we learned along the way and are now putting into a document.

Paramedic skillset was a topic discussed by eight participants (38%), resulting in 19 references. Participant 6 provided the following representative response as it pertained to home health nurses:

> There's a ton we can do that they can't—it's not that they can't do—they've not been trained to do, and it's not in their scope of practice. Paramedic is unique and is trained for emergencies outside the hospital. That's their basic training. If they see an emergency in the home, they're going to react, and they know what to do. Some home health that go in—RN, LPN, whatever their title is, they haven't been trained in emergency medicine the same way a paramedic is. A paramedic will be an asset in the home.

Participant 13 offered the following response:

I think the other thing too, is a little bit autonomy. You know, nurses are taught

pretty much to assess and relay. Paramedics are taught a lot more like physicians

assistants, and things such as that nature, where they're taught to walk in and

assess the situation and make their own decisions off the protocol—because we

are used to such more autonomy than your standard home health nurse would be.

Additional training and education for the community paramedic was a topic

discussed by 10 participants (48%), generating 27 individual references. Participant 10

offered the following statement:

The training part of it, the class, as far as EMS, we did little training ourselves.

We identified people within the healthcare system. People from the cardiology

group came in and did chronic management on [congestive heart failure] patients,

and case managers from the hospitals taught parts of it—and physicians from

primary practice. Clinicals were the same thing, we did our clinicals in various

settings, so that really helped us build relationships and get buy in from those

different providers—because they were engaged in the training.

Participant 5 offered the following statement:

It's very specific training. I don't believe that right now your street paramedic is

equipped to deal with some of the challenges that they're going to face with the

MIH program. Just learning how to access the assets that are available will be a

learning curve. It would definitely be something that you would have to start on a

small scale before moving to a larger scale

Participant 19 offered the following response:

> I sat in on every single one of these classes and I learned so much. It's so different
> than thinking like a paramedic. You have to put all of that aside and kind of take a
> nursing stab at it, in a way. It was a good class. We had excellent instructors.

The future use of telemedicine was a topic discussed by eight participants (38%),
resulting in 22 references. Participant 10 provided the following response regarding
telemedicine:

> I think telemedicine is going to be much more Important for them—being able to
> connect that patient and the community paramedic with that provider through
> telemedicine. Providers can bill for that now, so there is some incentive there for
> that, if they can do some telemedicine home visits, then the provider can bill for
> that as well.

Participant 13 provided the following response:

> The one downfall that I have with telemedicine is that I can look at a patient, and I
> can talk to a patient, but I can't do a hands-on assessment of that patient. So, I
> think if I had somebody who was there with the patient, where I could kind of
> conduct the interview, and still yet have somebody to do that hands-on
> assessment. listen to lung sounds, do that good physical exam—maybe with just a
> little additional training to do a few things that are not typically part of the
> standard paramedic physical exam, that could easily be expounded upon, such as
> use of an otoscope and things like that.

The topic of community paramedicine models was discussed by 17 (81%) participants and generated 69 individual references. Participant 10 offered the following statement regarding general support for all programs:

> To roll it out statewide, we certainly need the EMS Board's support. We need their guidance and direction. We need them to give us guidance but not tie or hands, because the programs are going to be so different across the state. From here to [REDACTED] are two completely different needs, two completely different systems.

Participant 17 provided the following response:

> We got deployed during Hurricane Florence in North Carolina, and we went to Wilmington, and New Hanover Regional Medical Center down there runs the EMS service, and we worked really close with them during the hurricane and during the week following the hurricane. And, they run a significant community paramedic program there. So, we were first introduced to community paramedicine actually in action, actually watching it work during the aftermath of a hurricane.

Public Health and Access

Public Health and Access was a broad theme comprised of 18 categories of first-cycle codes. The category included responses from all 21 participants (100%), totaling 348 references. Table 4 illustrates the first-cycle codes which encompass the broader theme:

Table 4

Public Health and Access, First Cycle Coding

Public health and access	Participants	References
Unmet medical needs	9	15
Treat and release	5	10
Technology infrastructure	5	10
Stakeholder relationships	12	26
Research	6	10
Public safety net	4	6
Public health	11	26
Primary care	9	33
Patient access	16	58
Low acuity	10	23
Hospital transfers	4	6
Hospital closures	6	12
Health care system	8	18
EMS strain	7	12
Behavioral health	6	11
Barriers	11	21
Alternate destinations	13	46
911 misuse	2	5

Patient access to care was a topic discussed by 16 participants (76%), which resulted in a total of 58 references. Participant 1 offered the following representative response concerning patient access to care:

Other than the fact that they can't get any specialized care here. I mean, we are basically just a lifeboat for patients here—to shuttle where they need to go to get their care. . . so being in a rural community, the time it takes to get the care that you need takes longer than if you were in an urban area.

The topic of EMS serving as the public safety net for healthcare was discussed by four participants (19%), with a sum of 6 references. Participant 10 offered the following statement concerning EMS serving as a public safety net:

Like I said, after 5 o'clock we are the only healthcare provider and we get utilized

a lot as kind of a PCP. You know, people will call, and they want us to come

check them out. They really don't want a ride to the hospital, but they need their

blood pressure checked, or their sugar checked, just kind of a second set of ears.

They're either okay, or they're not okay and need to go to the hospital.

Hospital closures was a topic discussed by six participants (24%), resulting in 12

references. Participant 10 provided the following statement on the topic of hospital

closures:

There are a lot of counties in our state now that have hospitals that are closing. So,

their model is going to be different, they're not going to be getting referrals from

their local hospitals. They're going to be getting referrals from larger facility an

hour away that's discharging a patient back to their county that doesn't have a

hospital or first-assist clinic or anything.

Participant 2 provided the following response on the topic of hospital closures:

But, given that 90% of all ER visits in the country have always been not for

emergencies—or even urgencies, if you cut the volume of patients by 90%,

certainly all of your rural hospitals will close. And that's not necessarily

something that couldn't, or shouldn't be done, you would just have to change the

way you deliver care.

Behavioral and mental health was a topic discussed by six participants (29%) and

resulted in 11 references. Participant 8 offered the following representative response:

I think one of the big gaps would be getting patients referred to specialized

treatment facilities. You know, drug and alcohol addiction, psychological issues,

that kind of stuff. We pick up a lot of patients now and take them directly to the

ER, and they either overwhelm the system, or what have you. I think if there was

a community paramedic that went to these peoples' houses and was able to

navigate the system for them and get them into the right facility instead of sending

them to the ER. I think that would be a big benefit.

Public health was a topic discussed by 11 participants (52%), with a total of 26

references. Participant 2 offered the following representative response:

You know, the problem, I think, with me trying to answer those questions is that

in an emergency department you see such a peculiar slice of the community

health problem—this is single visit, episodic care that we provide. It is designed

to only be one visit, and it doesn't give you much of a slice of the needs of the

community in that way.

The topic of EMS strain, or otherwise defined as the pressure placed on the EMS

system during high-volume periods that overload resources. The topic was discussed by

seven participants (33%), with 12 references. Participant 17 offered the following

response:

We run five ambulances in our service and…today is Thursday, and in the last

seven days we have run out of ambulances at least four times. And, some of those

calls that people have gone on and been tied up, would have directly impacted by

having a community paramedicine program.

Participant 9 offered the following response:

> To direct those non-emergent, lower acuity patients to physician's offices rather
> than transporting them to [REDACTED], which takes our ambulances out of
> service. We can have ambulances out of service on one transport for 4 hours
> because they are lined up against the wall at the hospital ER.

The topic of technology infrastructure was discussed by 5 participants (24%),
resulting in 10 individual references. Participant 21 offered the following response:

> We're fighting that battle now. We received grant money 3 or 4 years ago, and
> they put in so many thousand feet of line. We received a grant last year, in
> February, and the lender a million dollars, and they've been hanging those lines
> all over the county now. We are currently applying for the next leg of that. The
> governor, in and around us, declared that, because we're distressed status, we
> need to be brought up to standard with everyone else around us.

The topic of stakeholder relationships was discussed by 12 participants (57%),
resulting in 26 individual responses. Participant 19 offered the following response:

> They're extremely stoked about this. They are very, very supportive from the
> county commission to our mayor to the hospitals to the community stakeholders
> like home health. Alternative transportation methods—some of our wheelchair
> vans, United Way. Some of our charitable groups…we have support.

The topic of alternative destinations was discussed by 13 participants (62%),
resulting in 46 individual responses. Participant 3 offered the following response:

Ultimately, I think the major benefit to EMS is the diversion of patients—one,

away from emergency departments and then ultimately just away from any sort of

transport. The point of community paramedicine is to utilize other resources that

may or may not be available right now—to divert these patients to at some point,

either immediately or in delayed fashion.

Other emerging topics discussed and categorized under the broader theme of

Public Health and Access included: Unmet medical needs (43%), treat and release (24%),

research (29%), primary care (43%), barriers (52%), 911 misuse (10%), low acuity

(48%), and the healthcare system (38%).

Financial/Reimbursement

Financial matters and reimbursement for community paramedicine programs was

another broad theme to which all 21 participants (100%) contributed, for a total of 160

individual references.

Table 5

Financial/Reimbursement, First Cycle Coding

Financial/reimbursement	Participants	References
Low income	3	3
Hospital readmissions	5	12
Financial	16	60
CP reimbursement	16	78
CMS penalties	4	6

Reimbursement for community paramedicine services was the topic addressed most often

within the broader financial category, spanning 16 participants (76%) and 78 references.

Participant 3 offered the following representative response:

Step one is that you've got to have some sort of reimbursement structure, and we will see what this new structure is going to be. So far, the sustainable programs have been funded through grants, and we've got a good amount of research obviously that we are saving the insurance companies a ton of money by doing this.

Participant 18 offered the following response:

I think as time goes on as and we demonstrate that these programs are workable…it's sustainable. And hopefully the models improve and that's definitely going to be a hindrance to the community paramedicine is getting third-party payers: Medicare, Tenncare, BlueCross, get on board with paying for us to provide these services and making it sustainable. That's a huge hurdle.

Participant 19 offered the following response

We don't really know where the money is coming from yet. We've had discussions, Okay, we're going to be saving the healthcare system X amount of dollars on readmissions. So, they should pay a percentage. . . sure. That's been discussed. I mean I don't think at this point there's anything off the table, but there's not been any decisive answers. . . I think we can get the payers on board. Again, I think they're going to see the cost effectiveness. I don't think it's going to be a hard sell. It's just getting that ball rolling. and that's a big ball to get rolling.

Participant 4 offered the following response concerning the CMS ET3 rollout:

> I was actually at the announcement in D.C., we traveled up there for that. CMS
> would say, and I've heard them say on their webinar, that ET3, emergency triage,
> treat and transport does not deal with community paramedicine at all. It's
> designed around ambulances. And, the reason they say that, in my opinion—I've
> not seen this in their literature—In my opinion, because they can't define a
> community paramedic yet, but they can define an ambulance.

Participant 10 offered the following representative response, which also addressed the
new CMS ET3 model:

> One of the challenges with community paramedicine right now is that a lot of
> things that community paramedics are doing is to reduce transports to the
> hospital, reduce readmissions, and navigate patients away from the ED, and until
> this ET3 model came out, there's really no incentive for any ambulance provider
> not to just transport everybody to the hospital, and that's how we get paid. So, it's
> exciting, even though they have said with this ET3 model, it is not community
> paramedicine and it can't be used to directly pay for that.

Participant 11 offered the following response:

> Whoever is paying the money dictates how they'll pay it, why they'll pay it, for
> what reason they'll pay it, when they'll pay it, and that's what you're up against.
> Again, if the paramedics are not even up on the radar screen with these carriers—
> the Blue Cross's, and the United Health Care's and the Medicare's, and Medicaid

and all that—if they are not even on the radar screen, it's not going to go anywhere, and all it's going to end up being is a charity function.

Home Health Industry

The topic of home health was discussed by 19 participants (90%) with a total of 96 individual responses. A common concern among participants was the similarities between the rural model of community paramedicine and the home health industry. Participant 10 offered the following response regarding similarities between community paramedicine and home health:

Home health is not going to go see patients unless they meet criteria for home health, which is pretty stringent criteria. I think the opportunity for us is those patients who get discharged from the hospital with a stack of discharge instructions go home and they are expected to follow them and they have no idea what half of those discharge instructions mean, or they don't have means to get medications and things like that, and we can follow those and arrange that and help them in a short term—over a short period, and those are just patients that home health is not going to get paid for—these patients are not going to meet that criteria.

Participant 19 expressed the following opinion:

Initially, they were standoffish, because they viewed it as competition. Until we actually went in with them on an executive level, So, here's what we're proposing, here's what we want to do, and once they realized, Hey, we're going to

be able to pick up a patient—we're going to get the ones that fall through the home health cracks.

Participant 4 provided the following response:

I would have to confirm that in that process, we involved folks from multiple disciplines. We had home health representatives, and rural health, physicians, and EMS was well represented, as well as EMS educators. And it was also diverse across the state with representatives from each of the eight EMS regions. This is not a home health model whatsoever. Home health has very strict rules on what they can be paid to see.

Participant 7 offered the following response:

For us it would be a benefit because home health comes from outside our county. So, we would be able to offer something that's not necessarily offered here, you know, from this county, so that part would be good. I don't think community paramedicine is going to take the place of home health—that would be a lot of explaining to do.

Participant 8 provided the following response:

Why not just expand home health care's role? I mean, they are already doing it, essentially. And, I think it comes down to, you know, home health care is going to be really good at the stuff that we're weak at.

Urban EMS/Community Paramedicine

The topic of urban EMS and community paramedicine was discussed by 16 participants (76%) with a total of 50 responses. Participant 18 offered the following representative response:

Well, of course, some of this is a learn-as-you-go kind of thing but looking at other programs in other places and hoping they may be able to help unload some of the demand on EMS and the ER by channeling people to more appropriate venues for care. I'm hoping that. . . our loyalty customers, I think, as they are referred to, we can assist them in finding more appropriate means to deal with issues they have.

Participant 19 offered the following response:

So, we're going to take a small demographic, initially, and run with it. That's why we picked high utilizers in the ED, because we can keep it more narrow at that point. And then as we expand, and we get our footing more underneath us, then we'll grow as we need to. We're going to start with a small amount of people and go from there.

Participant 4 offered the following response regarding the effects of ER overcrowding:

Absolutely, there is no doubt. It has an adverse impact on our operations on a daily basis. We have ambulances waiting at ERs for extended periods waiting to offload. We estimate that we lose the equivalent of two ambulances a day because they are not available because they are waiting at ERs. I did not do that calculation myself…We know there are times when the ER's holding our units,

we call them units, our ambulances, 2 to 4 hours even, before we have a bed

available—to transfer care. It is that extreme. We have extended wait times at

hospitals fairly regularly.

Participant 9 offered the following response:

In our county, it would be being able to go out and evaluate these patients and

prioritize the physician offices—because that is what we have—to direct those

non-emergent, lower acuity patients to physician's offices rather than transporting

them to [REDACTED], which takes our ambulances out of service, with transport

times of 30 minutes. We can have ambulances out of service on one transport for

4 hours because they are lined up against the wall at the hospital ER.

Rural EMS/Community Paramedicine

The topic of rural EMS and related community paramedicine programs was

discussed by 19 (90%) participants, with a total of 47 recorded references. Participant 17

offered the following representative response:

There are still a lot of things I would like to see us do, and actually, community

paramedicine is one of those things I would love for us to do. But again, we are a

small rural county, and I don't think budget-wise, that is something that is going

to happen in the next 10 years. I just don't see that that is a viable budget option

for us, although I'd love to see it happen.

Participant 21 offered the following response: "Of course, when you get to your rural

areas, you can't have enough coverage anyway. For years past we probably went 10 years

without a hospital here and EMS was your medical".

Participant 5 offered the following

> I think we have the same short comings that that most rural counties have. We
> don't have a lot of physicians, we only have three actual main physicians. Most of
> the healthcare, especially at the provider level is done by nurse practitioners. That
> kind of sets up a shortfall at times.

Participant 7 offered the following opinion:

> I think we would be utilized more for home health. It would be a good program,
> but our job is to answer the 911 call, or BLS medical transport. You know, in
> your rural counties, you do a lot of community paramedicine just off the nature of
> being that healthcare provider, but I don't think, at the end of the day, it lines up
> with our mission.

Five Perceived Attributes of Innovation

A deductive coding process was used to explore the perceived attributes of
innovations, as prescribed in Rogers' theory of diffusion of innovations. There are five
attributes in which adopters perceive the benefits of an innovation: relative advantage,
compatibility, complexity, trialability, and observability (Rogers, 2003).

   Relative advantage. Relative advantage represents the perception of an idea, or
innovation, as being better than the existing status quo, whether that may be a
technological advancement, policy, or program (Rogers, 2003). Participant 10 offered the
following representative response:

> I think it is a great way for us to do a better job of getting patients the care they
> need at—the right type of care, rather than just taking everybody back to the

hospital—to coordinate with physicians, and things, through community

paramedic, to get those patients the care they need in their homes in a much more

efficient solution than just transporting everybody to the hospital.

When asked about relative advantage, Participant 14 offered the following opinion:

I cannot at this time. I looked at it . . . I went to the EMS directors meeting last

year, or the year before, and they discussed it—I mean the Medical Directors

meeting, and they explained it. I don't know if we could utilize it.

Participant 15 offered the following response: "I really don't know that it would benefit

here in this county just because of the home health. I think that's going to hurt home

health when you do community paramedicine."

Participant 19 provided the following representative response:

It's going to improve Community Health. We're going to be able to go out and

make sure the patient is living in a home that is safe, and we will come out and do

a home assessment—safety assessment, first thing, initial assessments, medication

reconciliation making sure these patients understand their discharge orders. We

will help them coordinate transportation to some of these doctor's appointments.

We're going to be kind of the filter, or the go to between their primary care and

them.

Participant 4 offered the following response:

I see the opportunities in areas where unfortunately we have seen hospitals close.

We know, particularly in [REDACTED] Tennessee there have been several small,

rural hospitals close because they could not continue to operate. So, one must

imagine that that has had a significant impact on EMS agencies in their county. If

you have a medical emergency, you have to be transported out of the county

every single time. That's a scary proposition. So, I can see community

paramedicine models that are geared toward reducing the impact of those non-

emergency calls and avoidable calls, so as to increase the availability of

ambulances for true emergencies.

Participant 7 provided the following response:

Absolutely. Like I said, after 5 o'clock we are the only healthcare provider and we

get utilized a lot as kind of a PCP—you know, people will call, and they want us

to come check them out. They really don't want a ride to the hospital, but they

need their blood pressure checked, or their sugar checked, just kind of a second

set of ears, you know, they're okay, or they're not okay and need to go to the

hospital.

Compatibility. Compatibility refers to the perception of new innovations, and

how compatible they are with the status quo, or more specifically applied to this study,

how community paramedicine will fit with other aspects of EMS. Participant 15 provided

the following response: "I think it would be good, but I think they need to fix the

problems in EMS before they start advancing it out in the community, like community

paramedicine".

Participant 17 offered the following response:

We got deployed during Hurricane Florence in North Carolina, and we went to

Wilmington, and New Hanover Regional Medical Center down there runs the

EMS service, and we worked really close with them during the hurricane and
during the week following the hurricane. And, they run a significant community
paramedic program there. So, we were first introduced to community
paramedicine actually in action, actually watching it work during the aftermath of
a hurricane.

Participant 18 offered the following response: "Perhaps not in a traditional sense, but I
think as the evolution of EMS continues, I think this is a very good and natural fit and
something that would work well in our system".

Participant 19 offered the following response:

I do, I think this is going to be the future for EMS. You may have heard, I'm sure
you have, especially since you have an EMS background, Medicare just rolled out
the ET3 model pilot for the next 5 years. Unfortunately, that does not apply to
community paramedicine at this point in the game.

Participant 4 offered the following response:

I think the insurers are going to be interested in partnering with EMS agencies to
deploy community paramedicine models, because they see it as a way to reach
people that they can't reach currently. And, so we have the unique advantage of
being fore deployed in the community. We are already stationed throughout.
Couple that with we are trusted in the community—our brand is good.

Complexity. Complexity refers to how difficult the innovation will be to
comprehend and to use. Participants were asked how difficult it would be for the public

to understand and use community paramedicine programs. Participant 1 offered the

following response:

> I think you will get a lot of confusion from the community at first. For one thing,
> they are used to—there is a lot of crossover with home health, and what that
> would entail. So, you're going to see a lot of people that are confused as to what
> the difference would be between this model and what home health does.

Participant 12 offered the following:

> I think that there would definitely be some complicating factors. I don't know if it
> would be that difficult to get the concept across in those areas, but the logistics of
> making the program happen may certainly be complicated, just from a staffing
> and training perspective.

Participant 15 offered the following response:

> Very, because right now I don't even understand EMS more or less community
> paramedicine. But one benefit, it may help, because you're getting those
> paramedics out in these communities and I think that's a lot of EMS's problem is
> community awareness.

Participant 17 offered the following response from an urban perspective:

> Some of my closest friends work at [REDACTED]. For [REDACTED] Fire
> Department, and it would be really easy for their citizens to understand it. Hey,
> we are going to send this vehicle out, and it's going to have this person on it, with
> this capability, and they would roll right with it. I think in a big city like that, it

would be real easy. For a rural area—like a few of the counties that are around us,

it would be a little more difficult to get the community on board.

Participant 18 offered the following response:

EMS is still a relatively new field, you know, spanning 40 plus years but you still

have people that do not understand the concept of EMS as it is today. So, this is

going to be a giant leap in trying to get people educated and knowledgeable with

what we're doing. And that's something I don't see a quick, easy fix to. It's going

to be a significant period of time to get people involved.

Participant 5 provided the following response:

I do believe it will be a hard sell. Initially, at first, because the public—we have

geared them for years now to—you call 911 and an ambulance is going to show

up and take you to the hospital. To be calling for help and someone other than an

ambulance shows up with an option other than taking them to the hospital. I do

believe that it will be a difficult sell initially.

Participant 7 offered the following statement:

I think our community is kind of unique. They are used to us being there anyway,

so it would be a branch off of us. I don't think we would have a big learning curse

here, but I think a lot of your counties would—that have a 24-hour clinic, or a 16-

hour clinic that people are used to going to. We are kind of utilized that way

anyway—without the official community paramedicine program.

Trialability. Trialability is the degree in which a given innovation may be tested

by a potential adopter prior to making a full commitment (Rogers, 2003). In the case of

community paramedicine programs in Tennessee, the element of trialability was universally assumed to be experienced through the implementation of a temporary pilot program. One caveat that bears mentioning, the category of trialability, as well as the following category of observability, are captured through the adopter lens, as those questions were asked of potential adopters themselves, and no attempts at gauging public opinions were solicited or offered. Of the 13 potential adopters interviewed, all but one agreed that a pilot program would be beneficial, if not necessary. Participant 17 provided the following representative response:

> I think that would be a necessity. In our community we had to do a pilot program using the existing personnel in a way that was not necessarily certified community paramedic—you know, we have a lot of critical care paramedics that could bridge that gap pretty easy, and so getting those guys out in the field in a pilot program would be paramount. Because then, we could come back to our legislative body with data, and say look, this is the data, and this is what it saves us in the long run for an investment on the front end. And I definitely think that would be one of the things that would be important.

Participant 18 offered the following response:

> I think a pilot will definitely be very important thing. With Tennessee, there's not a great deal of experience in this specific venue. I know that [REDACTED] has a program that I don't think is called Community paramedicine but they've been dabbling in that the last couple of years and had some success with it and I think any time we can pilot something—look at it and try to evaluate how it's going to

work here. It's going to be a benefit to us to see if we can't make this work. I think we can, but until we actually get out there and get boots on the ground, there's no way to know.

Observability. Observability is the degree to which the direct results of an innovation are publicly visible (Rogers, 2003). As previously stated, responses were solicited through the lens of the potential adopter and not the general public. Participant 10 offered the following response:

I think from our experience, and we've done that—not in Tennessee obviously, but other programs. It is very important to see the different programs that are out there. I think that, while that's very important, services that are looking at community paramedicine need to be careful not to just try to duplicate what somebody else has done. You really have to look at what the focus is in your community and try to fill the gaps and meet those needs in your community and not just duplicate what somebody else has done. Every community is a little bit different.

Participant 19 offered the following response:

Eagle County Colorado was one of the first founders, and [REDACTED] is one of their paramedics that is over community paramedicine out there, and he and I have spent the end of January together. So, I got to bounce some things off him. Multiple other states like Florida, New Jersey, Montana, Wyoming. Other states that have this… Minnesota. I've gotten to talk to their paramedics and get some ideas. One thing I've noticed every single—like you just said a few minutes ago,

every single company, or every single service, every community paramedicine

program is unique to themselves.

Summary

As Tennessee begins to roll out community paramedicine on a state level, several

services across the state are currently preparing to launch community paramedicine pilot

programs in their respective areas. In addition, the Department of State Division of

Publications released the proposed rules for community paramedicine on December 16,

2019, which will become effective on March 15, 2020. Participants in this study included

13 EMS directors, or high-ranking officials, two county mayors, three EMS medical

directors (two of which are still current), two ER physicians, and other community

stakeholders who may, at some point, have influence over the adoption of community

paramedicine programs in Tennessee. A single, overarching research question was

designed to explore the opinions, attitudes, and beliefs among participants regarding

community paramedicine in Tennessee.

First-coding analysis of the data included 39 categories of participant responses

which emerged from the data during an inductive process. The categories were

subsequently narrowed to six common themes: public health & access, community

paramedicine conceptualized and defined, all things financial, home health industry,

urban EMS & community paramedicine, and rural EMS & community paramedicine. A

second, deductive process was used to gather and analyze data based on Rogers perceived

attributes of innovation; relative advantage, compatibility, complexity, trialability, and

observability.

Chapter 5: Interpretation, Recommendations, and Conclusions

Introduction

As EMS service providers across the state of Tennessee consider adopting community paramedicine programs, it is important to recognize variables that may affect the success of future adoption and implementation of new programs. In this research study, I collected data from 21 participants, including 13 EMS service directors or other high-ranking officials, as well as EMS medical directors, ED physicians, primary care providers, county mayors, and home health representatives. The purpose of this qualitative research study was to explore the opinions, attitudes, and beliefs among key decision makers regarding the adoption and implementation of community paramedicine programs in Tennessee. This chapter includes a review of the overarching research question and the subsequent findings, analysis, recommendations, and discussion.

This research design was a qualitative case study focused on the willingness and readiness of key decision makers to adopt community paramedicine programs in Tennessee. The study was bounded by the constructs of community paramedicine, as well as geographically within the eight EMS districts in the state. For the study, I employed an exploratory design that was multi-sited to explore individual opinions of potential adopters and other key decision makers regarding community paramedicine as it existed within a specific social system and in a pre-diffusion stage.

The primary purpose for conducting the research study was to explore participant opinions for the potential acceptability of community paramedicine as an innovation. Rogers (2003) described this form of prediction research as *acceptability research*, which

includes determining perceived attributes and exploring an innovation in its pre-diffusion stages, and the timing of the study proved impeccable, as the completion of this study predates the implementation of pilot programs in the state.

Summary of Findings

Six overarching themes emerged from the data corpus: (a) community paramedicine conceptualized and defined, (b) public health and access, (c) financial/reimbursement, (d) home health industry, (e) urban EMS and community paramedicine, and (f) rural EMS and community paramedicine. In addition, participants also provided responses to a priori questions regarding the five perceived attributes of innovations: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability. Lastly, participants were asked at what point along the adoption continuum they believed their service would adopt community paramedicine programs.

A total of 102 EMS services in Tennessee were invited to participate in the study, and 13 accepted and provided semi-structured interviews. NVIVO software was used for data analysis, and six overarching themes emerged. A sum of 405 references were recorded as all 21 participants defined and conceptualized community paramedicine. Within the broader theme, 17 participants (81%) discussed community paramedicine models, whereas 13 participants (62%) shared opinions on potential pilot programs in the state. The public's perception of community paramedicine was discussed by 15 participants (72%), and 12 participants (57%) discussed the statewide implementation of community paramedicine programs in Tennessee.

Another broad theme involved public health and access, among the 21 participants, 16 (75%) discussed patient access to care, 13 (62%) discussed alternative destinations, 11 (53%) discussed low acuity patients, and 12 (57%) discussed stakeholder relationships. Financial considerations ranked third as a category with 159 references among all 21 participants (100%). Topics in this theme included reimbursement for community paramedicine services (16 participants, 76%), hospital readmissions (five participants, 24%), and low-income patients (three participants, 14%). Other broad themes included the home health industry and rural and urban EMS systems; all themes are discussed further in the next section of this chapter.

Interpretation of Findings

As of this writing, no community paramedicine programs existed in Tennessee. However, prediction or acceptability research can be beneficial in exploring, and even predicting, the rate of adoption of a given innovation (Rogers, 2003). Rogers described three broad strategies for conducting acceptability research; the first involves exploring the rate of adoption of similar past innovations to aspects of the future innovation. This strategy was explored, in part, by referring to data present in the literature review and finding application to the current innovation. A second strategy is to present a hypothetical innovation, which I found to be unnecessary as most participants had a strong knowledge of the basics of community paramedicine. The third strategy is to investigate the acceptability of a potential innovation as it exists in its pre-diffusion stage. This third category warranted much devotion as it is most relevant at the point in time that innovations are being implemented and evaluated or, in this case, where pilot

programs are set to be launched and evaluated in the near future. This study was exploratory in nature and it would be difficult to predict its long-term contribution to the subject of community paramedicine. However, a desired goal was to contribute to the body of existing knowledge, especially as it pertains to the understanding of the adoption and diffusion of new innovations.

Contribution to Existing Literature

  Foundational publications: EMS in the health care system. As detailed in Chapter 2, the *Emergency Medical Services Agenda for the Future* was a 1996 federally funded foundational white paper that loosely predicted the adoption and diffusion of community paramedicine. At minimum, the publication identified that EMS would need to evolve and adapt in order to maintain sustainability, and specifically, it would need to integrate with other healthcare services. Certainly, sustainability in healthcare extends beyond the realms of EMS. Participant 2 offered this unique perspective as it pertains to the quality of healthcare and sustainability within the overall delivery system:

    And, of course, we decided 40 years ago in this country that we couldn't afford

    high quality care for everybody, and so the movement over the last 40 years has

    been to dilute the quality of care we give everywhere—and that's understandable

    because nobody can afford gold-plated everything. So, what I'm seeing is that

    there has been a shift in the way we deliver care in this country for a lot of

    different reasons—financial reasons, technological reasons. We've had to reinvent

    the wheel.

Other specific position papers identified in Chapter 2 include *Accidental Death &*
Disability: The Neglected Disease of Modern Society, published in 1966 by the National
Academy of Sciences; *The Rural and Frontier Emergency Medical Services Agenda for*
the Future, published by the National Rural Health Association; and the NHTSA's *EMS*
Workforce for the 21st Century, published in 2008; the latter publication addressed the
increasing number of aging baby boomers. Data collected from Participant 6 addressed
this ongoing concern:

> I look at the population figures and the census, and what's going to change over
> the next 10 years is when the baby boomers get—as they age, so I think there's
> going to be a different market for a different type of medical care in this county—
> and for the United States as a whole.

Community paramedicine research prior to 2012 and expanded roles. As
mentioned in Chapter 2, Bigham et al. (2013) conducted a systematic review of existing
literature that addressed expanded roles of the paramedic provider, which included a
discussion of an enhanced scope of practice for community paramedics operating in the
field. The data from this study offered continued discussion on the broad topic of
expanded roles of the community paramedic. The data were derived from six first-cycle
coding categories extending from the broad theme entitled community paramedicine
conceptualized and defined, which included entries from all 21 participants (100%), for a
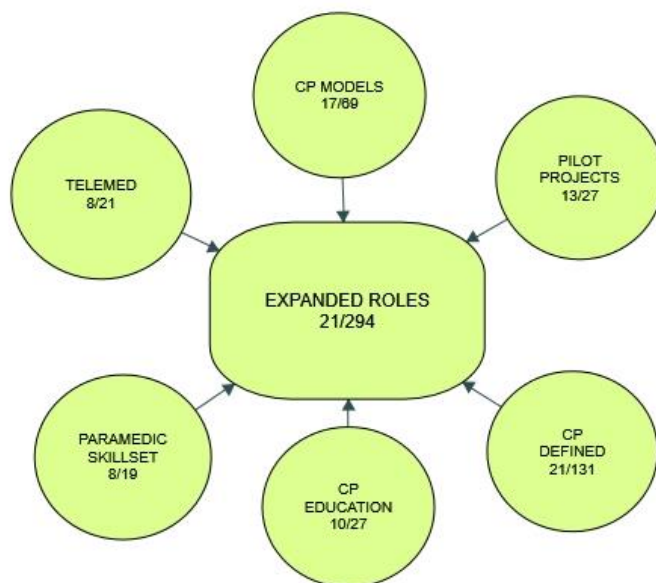combined total of 294 individual references, as illustrated in Figure 7.

Figure 7. Expanded roles.

Renfrew County program: Community paramedicine models. An

ethnographic study conducted in Renfrew County, Ontario, aimed to develop a

standardized community paramedicine model of care (O'Meara et al., 2016). This study

continued the conversation through a discussion of various community paramedicine

models, both preexisting and speculative. As with the discussion of expanded roles, the

bulk of data exists within the first-cycle coding categories: community paramedicine

models (17 participants/69 references) and community paramedicine defined (21

participants/131 references). The data included discussions on both rural and urban

models of community paramedicine, as well as preexisting models and novel ideas.

Participant 10 offered the following statement:

> I think they are going to be more like the Colorado programs. I don't know that
>
> we'll ever do as much, but certainly in our rural areas, especially areas that have

no hospital or no freestanding ER—something like that. These patients already

rely on 911 and rely on their ambulance services to provide that care.

CHAP-EMS program: public perception. The CHAP-EMS Program was

associated with a qualitative study conducted by Brydges et al. (2016). The researchers

focused on participant perceptions of community paramedics operating in the CHAP-

EMS program, a program providing cardiovascular and diabetes prevention services in a

specific residential housing community in Toronto, Canada. The data in this study

contributes to the conversation concerning public perception, at least as it was speculated

by participants at the time of interviewing. Applicable data were derived from two first-

cycle coding categories: public perception (15 participants/50 references) and community

paramedicine perception (7 participants/17 references), within the broader category of

community paramedicine conceptualized and defined. Participants were asked how

complicated they thought it would be for the public to understand the concepts of

community paramedicine. Of those participants asked, 73% believed that it would be

difficult for the public to understand, to various degrees, and 27% stated they believed it

would not be complicated for the public to understand. The topic of public perception

will be discussed later in this chapter as it applies to the compatibility aspect of the five

perceived attributes of innovations.

North Carolina programs/MedStar: Low acuity patients. Krumperman (2013)

claimed that too many low acuity patients depend on the services of EMS and hospital

EDs for non-emergency medical conditions which could be more appropriately treated in

non-emergency venues. The study compared two North Carolina pilot programs. The

Orange County program used an ETR response model, in which paramedics would evaluate patients on scene and then determine if transport to a hospital ED was necessary. The Mecklenburg County model used a TTR system in which employed nurses using evidence-based protocols to determine ambulance necessity. Data from this study contributes to the conversation of low acuity patients and ER overcrowding, as relevant participant responses were recorded within the following first-cycle codes: low acuity (10 participants, 23 references), 911 misuse (two participants, five references), treat and release (five participants, 11 references), high utilizer (eight participants, 15 references), and ER overcrowding (13 participants, 27 references).

Hostettler (2016) addressed the high cost of healthcare and the impact of excessive use of hospital EDs for chronic medical conditions. The research project examined readmission rates of heart failure patients enrolled in MedStar's Mobile Integrated Healthcare Heart Failure Readmission Avoidance Program in Fort Worth, Texas. Data presented in this study, as it pertained to chronically ill patients, was represented within the broad theme: Home healthcare (19 participants, 98 references) and references commonly referred to the management of chronic medical conditions as applicable under the proposed rural model of community paramedicine. Typical responses focused on aspects of EMS functioning in a capacity which some participants considered to be an infringement on the home health industry. Data from this study contributes to that discussion, as well as the discussion of low acuity patients, as data representative of the topic were collected through seven first-cycle coding categories
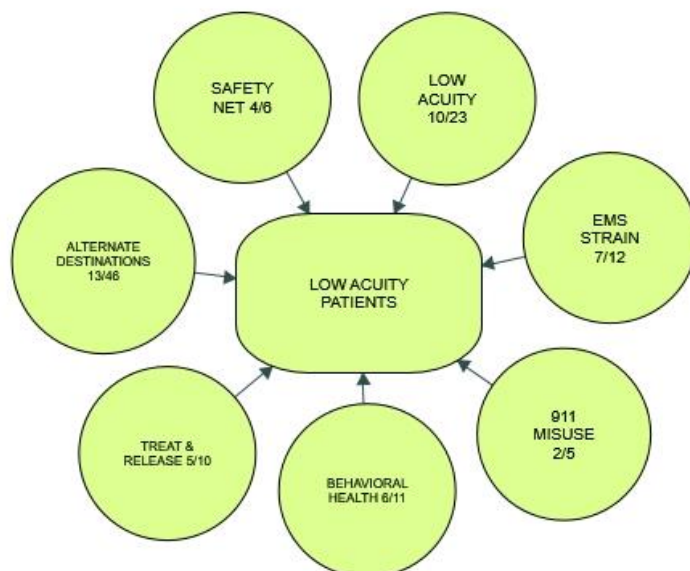
Figure 8. Low acuity patients.

Reimbursement for services: ET3 a possible gateway. How to pay for

community paramedicine services remains one of the most challenging barriers, as there

are no clear pathways to reimbursement at the present time. As presented in Chapter 2,

Zavadsky and Hooten (2016) discussed possible reimbursement gateways which may

arise from the creation of accountable care organizations (ACOs). Participant 16

contributed to the conversation by stating that EMS services may benefit from inclusion

into an ACO, but also warned that certain entities have struggled to get compensated

from hospitals:

> Well, if you could get the body to contract with an ACO, and they could get paid
>
> through the ACO. There is a push now to get pharmacists to do that—sign up with
>
> an ACO. There is a push for nursing homes to sign up with an ACO. What we
>
> have seen so far is, the hospital gets the money from the ACO, but then they don't
>
> want to send money to the pharmacist or the nursing home.

Goldberg (2014) referred to the current EMS reimbursement model as being flawed and being based on a CMS fixed-fee schedule which does not fully compensate ambulance services for total costs incurred. The author also claimed that the high cost of preparedness financially incentivizes ambulance services to transport a higher number of patients, which only adds to the problem of ER overcrowding. In addition to financial incentives, the ethos of EMS is transportation of patients to EDs, as expressed by Participant 1:

> There are a lot of patients that we see that probably don't need to go to the hospital, but we still transport them because of the liability issue. That is our policy. That is what we are trained to do.

In another effort afforded through a CMS grant, researchers studied a random 5% of Medicare claims between 2005 and 2009, which focused on Medicare-covered ambulance transports. In summation, EMS transported twenty-one million patients to hospital ERs in 2010, which 12.9% of Medicare patients were transported for low-acuity conditions, and 34.5% of patients not admitted to the hospital were subsequently discharged with low-acuity conditions which did not require ER care (Alpert et al., 2014).

Alpert et al., (2014) estimated that Medicare could have saved $560 million during 2010 had there been alternative treatment and destination options, which is the same amount referenced in the February 14, 2019 publication introducing the Center for Medicare and Medicaid Innovation's Emergency Triage, Treat, and Transport (ET3) model. The new ET3 is a 5-year pilot program which will allow EMS services to transport patients to alternate destinations, such as primary care physicians or urgent care

clinics, and in some instances, provide treatment on scene using telemedicine or through

the employ of a qualified provider on scene. The ET3 program initiative was announced

by representatives from the CMS and the DHHS at a fire station in Washington D. C. on

February 14, 2019, 5 days before the first participant interview was conducted for this

study.

The program is slated to begin in January 2020, with applications being released

during the summer of 2019. The program will run for a period of 5 years and is open to

Medicare-enrolled ambulance providers. According to CMS, up to 40, two-year

agreements will be awarded to local governments, or other entities operating ambulance

services (CMS, 2019). At least one known participant in this study attended the February

14, 2019 ET3 rollout in Washington D.C., while another claimed that he was in the

process of applying for one of the 40 available cooperative agreements available through

CMS. Although participants have vehemently expressed that the ET3 program will not

fund community paramedic programs, the topic was discussed by Participants 4, 6, 7, 8,

9, 10, 18, and 19 (38%), which some suggested that the ET3 program could be a gateway

for future community paramedicine funding.

The study also addressed low acuity patients and ER overcrowding, in which each

bore significant conversation among participants in this study and included those

operating within both rural and urban areas. However, the perspectives among

participants differed greatly, with urban participants expressing concerns over ER

overcrowding and long wait times, while their rural counterparts were concerned more

with the vitality and survival of rural EMS services and hospitals. Participant 2 presented

this concern:

> But, given that 90% of all ER visits in the country have always been not for
>
> emergencies—or even urgencies, if you cut the volume of patients by 90%,
>
> certainly all of your rural hospitals will close. And that's not necessarily
>
> something that couldn't, or shouldn't be done, you would just have to change the
>
> way you deliver care.

> Participants 3, 4, 9, 10, and 18 also discussed hospital closures during interviews.

In total, there were 12 references among six participants (29%) in which mentioned

hospital closures in Tennessee. The subject of ER overcrowding was addressed by a total

of 13 participants (62%). Participant 4 offered the following statement:

> Absolutely, there is no doubt. It has an adverse impact on our operations on a
>
> daily basis. We have ambulances waiting at ERs for extended periods waiting to
>
> offload. We estimate that we lose the equivalent of two ambulances a day because
>
> they are not available because they are waiting at ERs.

The topic of hospital closures in Tennessee is not limited to rural application only, as

several urban hospitals have also closed over the course of the last decade. Certain

models of community paramedicine promote transporting patients to the most appropriate

facility, often referred to as alternative destinations, in which means destinations other

than a hospital ED. Figure 9 illustrates the correlation between hospital closures and

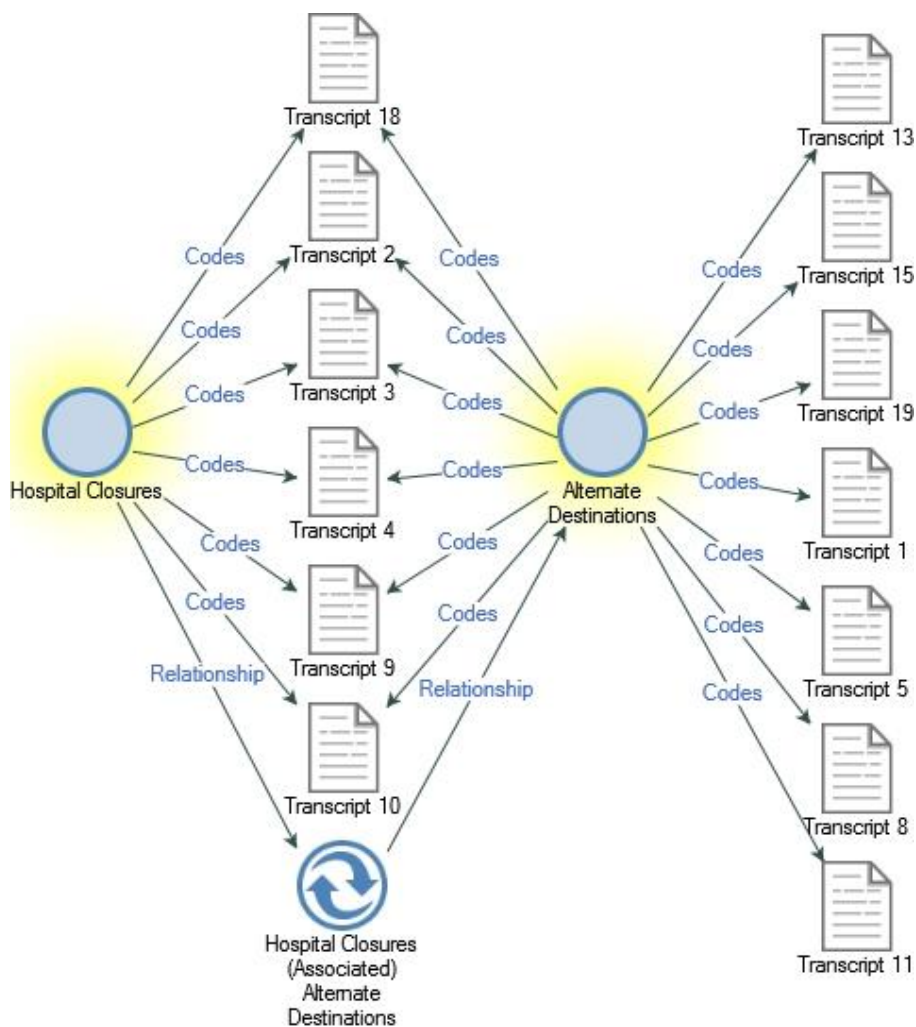alternative destinations, as discussed among participants.

Figure 9. Hospital closures/alternative destinations.

Flex study. The Flex program was created by Congress in 1997 and was aimed at

promoting rural health initiatives through grants and other services. The Flex study was

conducted in 2013, and the authors pointed out that certain rural health delivery models

may closely parallel, and possibly interfere with services provided by other healthcare

professionals, specifically home health providers (Pearson et al., 2014). The topic of

home health engendered significant data among 19 participants (90%), with a total of 98

references, as many participants voiced similar concerns to those expressed in the Flex Study.

Theoretical Framework Influence

Everett Rogers's theory of diffusion of innovations was employed as the study's foundational theoretical framework. In Rogers's theory, there are four main elements in the diffusion of innovations. Foremost, it begins with an innovation, such as community paramedicine, and then how that innovation is communicated over time within a specific social system. Within the element of innovation exists the five perceived attributes of innovations. A provisional coding process was used to explore these five perceived attributes as they pertained to this study. Of the 13 participants interviewed, 77% claimed they saw some degree of relative advantage in community paramedicine programs, while 23% stated they perceived no such advantages. It bears mentioning that of the four urban participants asked, 100% recognized relative advantage. In contrast, two of the three (66%) participants not seeing a relative advantage where from rural areas. In terms of compatibility, 85% of participants believed that community paramedicine was compatible with the overall mission and goals of EMS, while 15% stated otherwise. When asked how complicated they thought community paramedicine would be for the public to comprehend, 54% stated that it would be complicated, while 46% stated that it would not be complicated to understand. Ninety-two percent of participants stated that it would be necessary to experiment with a pilot program before making a long-term commitment, while 08% stated no trialability would be necessary. All participants (100%), agreed that it would be necessary to observe an existing program prior to adopting.

Table 6

Five Attributes

Attribute	Yes	No
Relative advantage	1, 10, 12, 17, 18, 19, 4, 7, 8, 9	14, 15, 5
Compatibility	1, 10, 12, 15, 17, 18, 19, 4, 5, 8, 9	7, 14
Complexity	1, 12, 14, 15, 18, 5, 8	10, 17, 19, 4, 7, 9
Trialability	1, 10, 12, 14, 15, 17, 18, 19, 4, 5, 7, 8	9
Observability	1, 10, 12, 14, 15, 17, 18, 19, 4, 5, 7, 8, 9	

The second element in the diffusion of innovations is *communication*. Essentially, in this case, the communication phase will entail three separate tiers, or specific communication channels: State, local, and the general public. In the simplest of terms, a communication channel is a means of transferring knowledge about an idea from one individual to another (Rogers, 2003). According to Rogers (2003), Mass media options are the fastest way to reach the general public, but in contrast, interpersonal channels offer a more effective means of influencing potential adopters. Thus far, in the state of Tennessee, community paramedicine has been communicated through interpersonal communication channels existing between state leaders and local EMS services, with opinion leaders and innovators leading the way.

Of course, state EMS leaders and local EMS leaders share a certain level of homophily, as they belong to the larger EMS family and therefore share a similar worldview that is indigenous to EMS providers. On the other hand, the general public will likely be unique and hold a variety of different beliefs and span across broader geographical and socioeconomic domains. With that said, homophily communication is easier and more likely to occur (Rogers, 2003). Once pilot programs are up and running

in Tennessee, it is uncertain if community paramedicine will be communicated through mass media or through interpersonal communications such as physician referrals. Perhaps while physician and hospital referrals may be most effective in communicating rural models, urban models may require some degree of mass media to communicate program initiatives to target audiences.

Rogers (2003) suggested that some degree of heterophily is necessary for the exchange of information to occur, and that ideally, all other characteristics between participants be similar except for the innovation itself. This idea of broad homophily between participants will obviously not be the case regarding the communication of community paramedicine programs to the general public. However, the success of such communications may instead rely more on the common denominator, in which in this case, is the provision of healthcare, in which may prove more akin to perceptions of relative advantage or even the aspect of compatibility among potential adopters within the public sector.

Time is the third element in the diffusion of innovations. Within the element of time, there are five distinct phases: *Knowledge, persuasion, decision, implementation and confirmation*, in which are collectively known as the innovation-decision process (Rogers, 2003). As mentioned earlier, while the state of Tennessee is entering the implementation phase of community paramedicine programs, individual EMS services and their associated stakeholders largely remain scattered among the knowledge, persuasion, and decision stages of the process. Furthermore, the general public has yet to be officially introduced to the knowledge phase, at least in Tennessee. The five stages

represent the component of time as they occur chronologically through the process

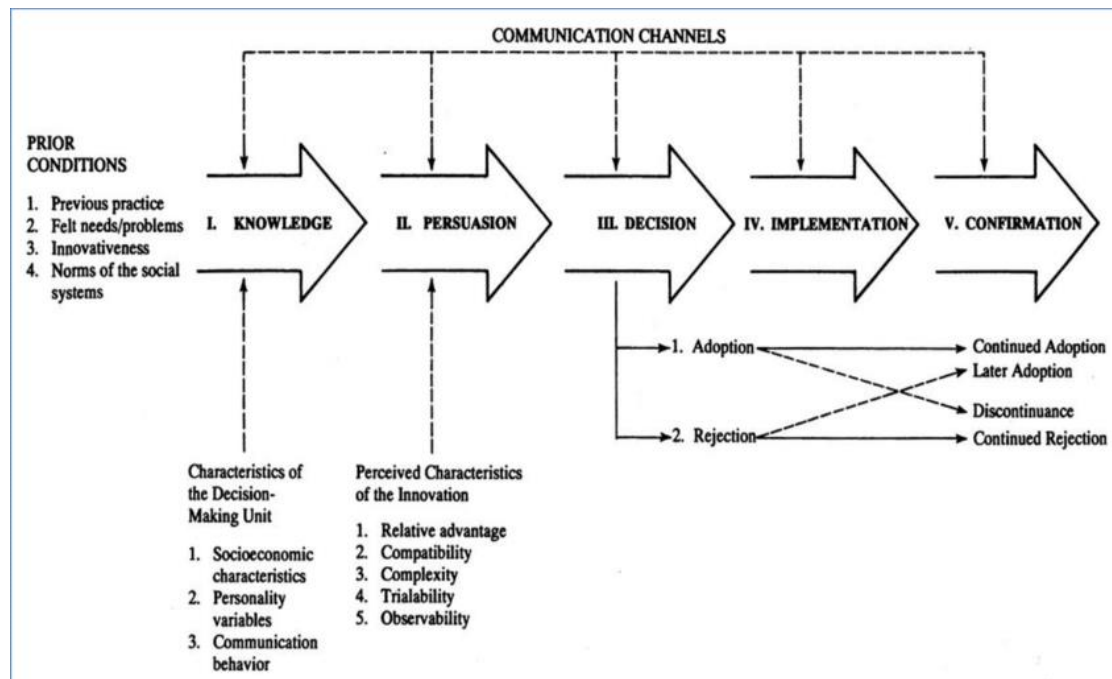(Rogers, 2003). Figure 10 illustrates the Innovation-decision process:

Figure 10. The innovation decision process. Adapted from *Diffusion of Innovations* (5th ed.) by Everett M. Rogers, 1995, 2003. Copyright 1995, 2003 by the Free Press. Reprinted with the permission (see Appendix D).

A *social system* is the fourth element in the diffusion of innovations. In this study,

the EMS profession was the target social system. However, as previously mentioned,

community paramedicine in Tennessee will have to endure the diffusion process one last

time as the innovation reaches the final social system, the general public. Although

participants were asked how they thought the public would perceive community

paramedicine, it bears mentioning that responses to that question were speculative, as

members of the general public belong to a different social system and were not

represented in this study. Of the participants asked, 46% stated they believed the concepts

of community paramedicine would be difficult for the general public to understand, and 54% stated they did not believe programs would be difficult to understand.

System norms play a significant role in the diffusion process (Rogers, 2003). The public is accustomed to the status quo of healthcare delivery, which may vary among different geographic and socioeconomic populations, but nonetheless remains normal to individuals. For instance, while urban residents belonging to marginalized populations may seek their primary medical care through the ER, their rural counterparts may continue to visit their family doctor, or suburban patients may choose to receive their care through local health clinics. Therefore, the general public represents more than one social system, which should be recognized, as it may be easier to sell the idea to marginalized urban residents than an elderly rural population, or vice versa. According to Rogers (2003), opinion leaders and change agents are needed to persuade other members of a social system.

Although EMS belongs to a different social system and possess a certain degree of heterophily from the general public, the two social systems are intertwined, as EMS operates daily within the broader spectrum of the general public. In short, EMS is already immersed in the community. Participant 4 offered the following response regarding the relationship between EMS and the community:

> When I show up in my vehicle, marked by my department and I'm in this
>
> uniform, then most people are receptive to the interaction. And, that's different
>
> from, say, another practitioner showing up in an unmarked vehicle and a pair of
>
> scrubs. They may not be as well received as I am in my readily recognized EMS

and fire uniform. I think that is an advantage we can use as well as we have the infrastructure in place to reach people. We have vehicles, we have communications. We have a safety piece there, and we are ideally situated to work in the communities.

According to Rogers (2003), opinion leaders are members of the social system, while change agents can be professionals with external influence, and who may be able to bridge the heterophily gap. Future success of community paramedicine programs in Tennessee may require social system influence from both opinion leaders and change agents. While the existing position of EMS in the community would likely provide opportunity for change agent influence, it remains uncertain who opinion leaders may be, or how their influence may be disseminated across communication channels.

The S-shaped bell curve is a familiar tool in diffusion research which identifies five adopter categories: Innovators, early adopters, early majority, late majority, and laggards. Thirteen EMS directors/officials and two county mayors were asked at which interval they believed their community would adopt a community paramedicine program. In total, there were 15 participants in which ranked themselves, or their respective organization or entity, in one of the five adopter categories. Forty percent represented rural areas, 46% were suburban, and 26% were from urban areas. In the S-curve diffusion model, the mean (average) is represented by the vertical line between the early majority and late majority categories, with a standard deviation of plus or minus two. Innovators and early adopters make up the first two categories, representing the first 16% of all adopters. Six (40%) of the 15 participants claimed inclusion into one of the first two

categories, as either innovators or early adopters. Of those six participants, three (50%)

were from urban areas and three (50%) from suburban areas, with no rural representation

within the first two categories. Furthermore, the last two categories, late majority and

laggards, were both represented by participants from rural areas. Therefore, according to

the data, there appears to be a stronger interest for community paramedicine programs in

more highly populated areas. Figure 11 illustrates the adopter categorization S-curve with
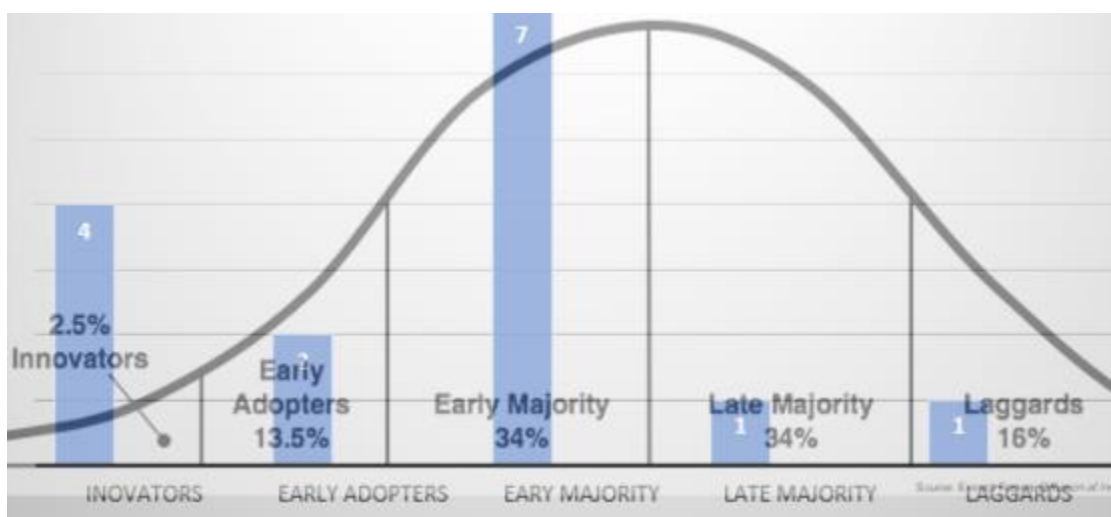
participant placement superimposed:

Figure 11. S-curve participant placement. Adapted from *Diffusion of Innovations* (5th ed.) by Everett M. Rogers, 1995, 2003. Copyright 1995, 2003 by the Free Press. Reprinted with the permission (see Appendix D).

Pro-Innovation Bias. According to Rogers (2003), a serious deficiency in

diffusion research involves a type of bias known as pro-innovation bias, in which

participants are already vested in the innovation itself, and therefore favor its success. As

seen in Figure 11 above, the innovator category represents the first 2.5% of all adopters,

yet in this study, 26% of participants claimed inclusion into the innovator category. This

data may reflect a presence of pro-innovation bias in this study, but it also may indicate

an increased willingness to participate in studies where there is a greater interest in the subject matter. On the topic of pro-innovation bias, as applied to this study, two caveats prevail. Foremost, diffusion research is often funded by change agents seeking monetary gain, and secondly, most diffusion research is conducted post hoc, or after an innovation has fully diffused (Rogers, 2003). This study varies in both circumstances, as no funding was received for this study, nor have community paramedicine programs began to diffuse in Tennessee. According to Rogers (2003), one way to avoid pro-innovation bias is to conduct research prior to the diffusion of an innovation. This study recognized that call for a shifting approach to data collection.

Limitations of the Study

Perceived limitations of the study were mentioned in Chapter 1, to include a lack of research in which is universally inherent to the profession of EMS. However, due to the scope of the research design and proposed goals, a lack of research did not have an apparent effect on outcomes. Furthermore, a lack of available data had no bearing on the results either, as the topic was not addressed among participants and was therefore irrelevant. The timing of the research itself served as a limiting factor, as the study was conducted prior to the adoption and diffusion of programs, and therefore much of the data collected was speculative in nature. However, as previously mentioned, acceptability research has its place within the broader field of diffusion research, and aspects of this study may serve to guide future adopters of the innovation at hand.

In terms of generalizability, it is imperative once more to mention that the participants of this study likely belong to a different social system than the general

public, and for diffusion to be successful it must also occur within the public sphere. While participants were asked how they felt the public would perceive community paramedicine programs, the element of heterophily must be assumed, as members of the general public were not included in the study. It is not known how the public will perceive community paramedicine programs, and therefore issues of generalizability must be assumed as well.

When considering the overall significance of generalization in this study, it bears mentioning that the population size of EMS directors in Tennessee is relatively small. There are 95 counties in the state and typically only one 911 provider ambulance service for each county. Therefore, the population of EMS directors of 911 provider services is 95, give or take any exceptions. If this were a quantitative study with a finite population of 95, using a percentage of 50% with a confidence interval of 25.39, and a confidence level of 95%, the calculated sample size needed would be 13. There were exactly 13 EMS directors/officials interviewed in this study.

Recommendations

The findings of this study may be beneficial to potential adopters of community paramedicine programs in Tennessee, as well as to potential adopters in other states. Recommendations for future actions include that Tennessee continues to define and develop community paramedicine across the state. Participant 10 warned against the creation of a "cookie cutter" program in which does not allow for divergent designs of programs, and correspondingly, it is recommended that such parameters be amenable and designed to facilitate the success of both rural and urban programs alike. In order to

circumvent issues of heterophily, it is recommended that individual adopters of programs engage in strategic planning aimed at disseminating community paramedicine concepts to the public prior to implementation. It is further recommended that future adopters conduct a community needs assessment to customize programs to best address specific needs of the community. Finally, it is recommended that potential adopters promote stakeholder relationships at the onset of planning, to include working with such entities as home health agencies in a coordinated effort to establish purposeful healthcare delivery models.

This study was unique in several ways. Foremost, the study occurred prior to the diffusion of the innovation itself, which is commonly referred to as acceptability research (Rogers, 2003). Also, this study was concentrated on the potential diffusion of programs on a somewhat macro level, as opposed to focusing on specific programs. However, it is recommended that future studies explore programs from beginning to end, to include the planning stages throughout program evaluation. Future diffusion studies might explore indigenous knowledge systems, or the role of change agents in program dissemination. However, at minimum, it is recommended that further research be conducted on the specific roles of rural community paramedicine programs and their proximity to home health delivery models. Final recommendations promulgate a need for research focused on hospital closures, the effects of community paramedicine program delivery models, and how programs may best be integrated into the broader healthcare system.

Implications

The results of this study may be useful to current or future adopters of community paramedicine programs, as well as to others interested in broader topics within the field of EMS, or healthcare delivery in general. The exploratory research design allowed for emerging themes and mixed viewpoints expressed among both internal and external stakeholders. Also expressed within the findings are fundamental differences of opinions between urban, suburban, and rural participants, in which collectively represent a significant degree of heterophily within the EMS social system. Other aspects of this research project may prove useful to future works, as it contributes toward the body of knowledge and deepens the understanding of community paramedicine as viewed through a preadoption lens.

Social implications of the study are present on multiple levels, as inferences traverse across individual and societal applications within the broader scope of healthcare. Community paramedicine, in its conceptual form, offers a new paradigm of healthcare delivery in which may be tailored to meet the needs of a given community. If future programs commit to meeting the emerging healthcare needs of the public, a recognizable contribution to social change would be evident, benefiting both the patient and the practitioner. Findings of this study contribute toward positive social change through the expansion of knowledge and understanding at a most crucial stage in the diffusion process, the preadoption phase.

All processes of this study were completed prior to implementation of pilot programs in the state of Tennessee. Such preadoption research, also known as

acceptability research, can be beneficial as information is gained prior to the diffusion of an innovation. Rogers (2003) further suggested that a more useful means of predicting rate of adoption is to gather and evaluate data prior to the decision to adopt. Because community paramedicine programs are forthcoming in Tennessee, no retrospective data exists. However, the qualitative design of this study allowed for an anticipatory approach aimed at exploring the opinions, beliefs, and attitudes of leaders who are among likely adopters of community paramedicine programs. In terms of theoretical importance, this study is exemplar of preadoption research and responds to the call for more research of its kind.

Conclusion

The purpose of this qualitative case study was to explore the opinions, attitudes, and beliefs of key decision makers regarding the adoption of community paramedicine programs in Tennessee. Based upon research results, issues of relative advantage, compatibility, and complexity may affect future decisions to adopt programs in Tennessee. In addition, this study provides a narrow but specific glimpse into the current landscape of healthcare delivery in the United States, including discussions on topics such as hospital closures and differences between rural and urban healthcare needs and respective delivery models.

While community paramedicine is an emerging concept in the field of EMS, individual patient care remains foundational to its premise. Accurate and relevant needs assessments should be completed, and adopters must be open to reinventing the original innovation (Rogers, 2003). To offer a quote often attributed to Henry Ford, "If I had

asked people what they wanted, they would have said faster horses." Although the origin is unconfirmed, Steve Jobs also attributed that quote to Henry Ford, but went further adding, "People don't know what they want until you show it to them. . .our task is to read things that are not yet on the page" (Goodreads.com, 2019). Of course, people do know that they want dependable, quality healthcare, but as EMS leaders and other healthcare professionals, it will be our job to figure out what will be on the next page.

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Appendix A: Letter of Invitation

Roger L. Ritchie
102 Stonewall Drive
Knoxville, TN 37920

Date

Dear Service Director:

You are invited to participate in a research study in which serves as the capstone project of my doctorate in Public Policy and Administration at Walden University. You were selected to take part in this study because you are an EMS service director, or other member of the EMS community within the state of Tennessee who has a presumed influence subject to impact future decisions to adopt community paramedicine programs within Tennessee. This initial invitation is part of a process known as "informed consent", in which affords potential participants an opportunity to understand the study prior to making the decision to participate.

The purpose of this study is to explore the plausibility of adopting and implementing community paramedicine programs in Tennessee, and to gauge the existing knowledge of the subject among decision makers. It will further serve to examine any opinions, attitudes and beliefs in which may influence the decision to adopt such programs. The study will also seek to identify any foreseeable barriers in which may preclude the adoption of programs within the state. While other external (outside of EMS) participants are likely to be included in the study, it will be necessary to begin within the field of EMS itself, and with those members in which are likely to have an influence over future decisions to adopt programs.

Participants in the study will be asked to submit to an interview, either online or in person, in which they will be asked to provide generalized data, personal opinions and other knowledge as it may pertain to the subject. Participants will not be asked to provide specific patient data or other information in which may violate existing laws or patient privacy. Interviews are expected to take one hour to complete. In addition, a debriefing process will follow in which will allow participants to review research results and to confirm findings. All biases are welcomed, as this study is designed neither in support of, or in opposition to community paramedicine in general. In fact, examining all existing perspectives will be essential to the validity of the overall study.

While no financial compensation is offered nor otherwise implied, participation in the study will ensure that valuable data be made available to the public. It is therefore duly

intended that the information gained through this study allow for broader insight into the topic and the facilitation of well-informed future decisions concerning the adoption of community paramedicine programs in Tennessee.

Sincerely,

Roger L. Ritchie

Appendix B: Consent Form

CONSENT FORM

You are invited to participate in a research study about future community paramedicine programs in Tennessee. The researcher is inviting EMS service directors and other influential EMS professionals, as well as governmental leaders and other stakeholders who may have influence over the decision to adopt community paramedicine programs in Tennessee, to participate in the study. This form is part of the *informed consent* process, in which allows individuals to understand the study prior to deciding to participate.

The study is being conducted by a researcher named Roger Ritchie, who is a doctoral candidate at Walden University. Although Mr. Ritchie is a licensed paramedic in Tennessee, this study is separate from that role.

Background Information:
The purpose of this study is to explore the plausibility of adopting and implementing community paramedicine programs in Tennessee, and to examine the existing knowledge of the subject among decision makers, as well as any opinions, attitudes, and beliefs in which may influence the decision to adopt programs in Tennessee. The study will also seek to identify any foreseeable barriers in which may preclude the adoption of programs.

Procedures:
If you agree to participate in this study, you will be asked to:

- Participate in an online or personal interview with the researcher at a time and date of your choosing. The interview segment is expected to take one hour to complete.

- Arrange for a private, secure and safe location (office, conference room, etc.) of your choosing for in-person interviews.

- Provide generalized data, personal opinions, and other knowledge as it may pertain to the study topic. You will not be asked to provide specific patient data or other information in which may violate existing laws or patient privacy.

- Participate in a debriefing process in which you will have an opportunity to review research results and confirm findings by providing feedback via email. All correspondence within the debriefing process will be conducted via email and conclude prior to the closing date of the study.

- Allow for the interview to be audio recorded by the researcher

Voluntary Nature of the Study:

The study is voluntary, and you are free to accept or decline this invitation. Furthermore, if you decide to participate now, and for any reason change your mind, you may freely withdraw your participation at any time and without consequence.

Geographically, the study involves the state of Tennessee, and thus all applicable counties, jurisdictions and private services in which oversee EMS services within the state will be invited to participate. However, due to limitations in scope and resources, not all volunteers may be chosen for participation. However, both rural and urban services will be included in the study, and each of the eight EMS districts will be represented. All volunteers will be notified of selection status within thirty days of invitation. Some volunteers may be asked to serve as backup participants should the need arise.

Risks and Benefits of Being in the Study

Other than the risks of any minor discomfort in which may arise during the interview process, no substantial risks are anticipated, and therefore, the study will not pose a risk to your safety or wellbeing.

Although direct participant benefits may be limited, the study serves as a premier effort to study the topic of community paramedicine in Tennessee. Any potential benefit gained through the dissemination of research data and findings is intended for the communities you serve as EMS professionals.

Payment:

There will be no direct payment made to participants other than the satisfaction of contributing to EMS research efforts in Tennessee.

Privacy:

The reports generated through this study will not disclose the identities of individual participants or their affiliated services and specific locations, unless such identification be welcomed and duly approved by the participant and the affiliate alike. Furthermore, the researcher agrees not to use personal information for any purpose outside the research project.

All data will be stored on either a password-protected computer or data storage devices, in which the later will be secured in a locked safe located at the researcher's home. All data will be kept for a period of five years, as required by the university.

Contacts and Questions:
You may ask questions at any point during the research process. The contact information for the researcher is as follows:

Roger L. Ritchie

███████████
██████████████

If you wish to talk privately about your rights as a participant, you may call the Research Participant Advocate at my university at (612) 312-1210. Walden University's approval number for this study is 02-15-19-0384394 and it expires February 14, 2020.

Obtaining Your Consent:
If you feel comfortable with the parameters of the study and agree to participate, please indicate your consent by signing and returning to the sender at the address above. A copy of the consent form will be provided to you for your records. A self-addressed, stamped envelope has been included for your convenience. Please include phone number and email address.

Phone #_____ email:
_____

Printed Name of Participant _____

Date of Consent _____

Participant's Signature _____

Researcher's Signature _____

Interview Framework and Guideline

ORGANIZATIONAL

1) Describe your role within your current organization.

2) Within your current role, do you feel that you have some degree of influence regarding major decisions? For example, the decision to adopt or reject a future CP/MIH program within your agency? Do you have a voice?

3) How would you classify your service? *(911 contractor, convalescent service, ALS units, BLS units, number of total units, government operated or private, etc.)*

4) Has the subject of community paramedicine previously arisen within your organization?

COMMUNITY

5) How would you classify your community/service area: Rural, urban or suburban?

6) Can you describe the healthcare landscape in your community? *(How many hospitals, clinics, primary care physicians, nursing homes, ambulance services, etc.,)* and if there appears to be a collaborative effort towards unity?
   ****PROBE****

7) In general, do you feel the medical needs of the community are being adequately met?

8) Can you identify any unmet medical needs of the community?
   ****PROBE****

9) Can you identify any current barriers in which affects your agency's ability to deliver efficient prehospital emergency care in your specific community?
   ****PROBE****

10) Do you feel that your organization has a good working relationship with other health care providers in your community? Explain.

PERCEIVED ATTRIBUTES OF THE INNOVATION

11) Can you identify any foreseeable advantages in which may result from a CP/MIH program in your community? *(1. Relative Advantage)*.

12) Do you think the concepts of community paramedicine are compatible with the overall vision and goals of EMS? How may it fit into the current culture of your organization? *(2. Compatibility)*.

13) How complicated do you think CP/MIH programs will be to utilize and understand by the public, and is there a specific CP/MIH model in which you feel would most benefit your community? *(3. Complexity)*.

14) How important would it be for your organization to experiment with a selected program before making a large-scale commitment? *(4. Trialability)*.

15) Based on your knowledge of existing CP/MIH programs, have you observed any tangible benefits? Any success stories? How important will it be to review the results of a local pilot program prior to adopting a program within your organization *(5. Observability)*.

COMMUNICATION ACROSS SOCIAL SYSTEMS *(Homophily v. Heterophily)*

16) How receptive is your local agency towards change? *(Homophilous aspects)*

17) How receptive to change are any external decision makers? For example, local government officials or other external stakeholders outside of EMS? *(Heterophilous aspects)* Describe your past experiences with such stakeholders.

18) How well do you feel community paramedicine has been promoted on a national and state level?

19) How do you feel community paramedicine would be received in your community?

20) How well do you think community paramedicine programs will be received among other health care providers, especially if there appears to be a conflict of interest?

21) Do you feel that the public will see the value in CP/MIH programs?

TIME

22) Since it has taken a substantial amount of time to adopt and implement CP/MIH on the state level, do you feel that these delays may affect the adoption of programs?

23) Once approved by the state, how rapidly do you feel programs will be implemented?

24) Are there other factors in which you feel may slow down the adoption of programs in Tennessee?

OPINION LEADERS WITHIN THE SOCIAL SYSTEM

25) How likely are you to be influenced by the success or failure of future CP/MIH programs within the state?

26) How likely are you to be influenced by a program in a neighboring county?

27) Do you foresee any unexpected consequences in which may arise due to the adoption and implementation of CP/MIH programs in Tennessee?

STAGES OF THE INNOVATION-DECISION PROCESS

28) In terms of the likelihood of adopting a future CP/MIH program, which category would your organization most likely fall under?

- Innovators, risk takers, tech savvy and most likely to implement one of the first 3 CP/MIH programs in the state. **(INNOVATORS).**
- Pioneering, visionary, opportunistic, and likely to be among one of the first 16 services to implement a CP/MIH program in the state. **(EARLY ADOPTERS)**
- Pragmatic, cautious, but still among the first 50% of services to adopt a CP/MIH program within the state. **(EARLY MAJORITY)**
- Willing only to adopt a CP/MIH program once well established in the state and with proven benefits identified. **(LATE MAJORITY)**
- Committed to the status quo and unlikely to adopt a CP/MIH program unless it was deemed necessary. **(LAGGARDS).**

EARLY MAJORITY 34%

LATE MAJORITY 34%

LAGGARDS 16%

EARLY ADOPTERS 13.5%

INNOVATORS 2.5%
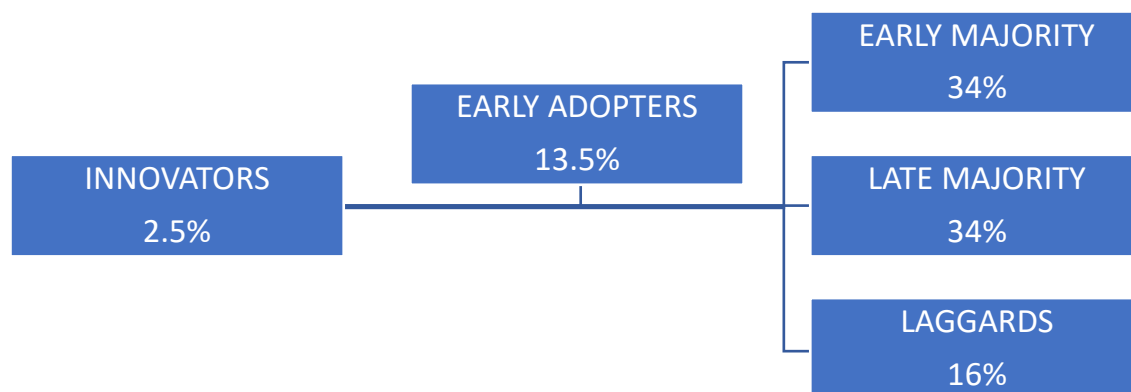
29) Is your organization currently discussing the possibility of adopting a future CP/MIH program?

30) Would you say your organization is vested in pursuing a community paramedic program?

VESTED
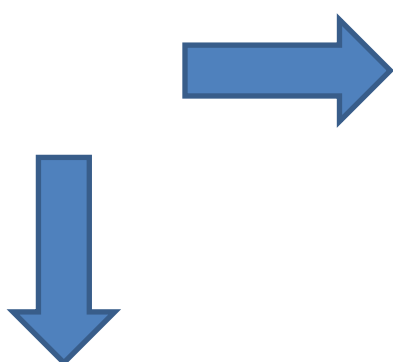
> 1) Is there ongoing discussion of adopting a CP/MIH program?
> 2) Have you completed a community needs assessment?
> 3) Are you familiar with the ......
> 4) Where are you in the decision process?
>   - Knowledge stage
>   - Persuasion stage
>   - Decision stage
>   - Implementation stage
>   - Re-invention stage
>   - Confirmation stage
> 5) Do you have a specific CP/MIH model in mind for your community?
> 6) Who would you consider the stakeholders to be?
> 7) Have you considered financing aspects?
> 8) In addition to financing, do you foresee other possible barriers? ****PROBE****

NOT VESTED

1) What are your personal thoughts about CP/MIH?
2) Do you feel your community could benefit from a CP/MIH program in the future?
3) How likely would you be to introduce the topic of CP/MIH for consideration among decision makers and other stakeholders in your community?

Appendix D: The Free Press Permission

Dear Roger L. Ritchie:

In reply to your request, you have our permission to use the Figure 5-1, "A Model of Five Stages in the Innovation-Decision Process" and Figure 7-3 "Adopter Categorization on the Basis of Innovativeness" as specified in your request from the book "**DIFFUSION OF INNOVATIONS, 5E**" by Everett M. Rogers in your Doctoral degree dissertation.

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