

# THE PARAMEDIC DEFICIT

The EMS Deficit: A Study on the Excessive Staffing Shortages of Paramedics and its Impact on  
EMS Performance in the States of South Carolina and North Carolina and Interventions for  
Organizational Improvements

by

James B Eubanks

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Doctoral Study Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Business Administration

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Liberty University, School of Business

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### Abstract

This is a qualitative multi-case study on emergency medical services (EMS) paramedic shortages, their effects on ambulance responses, and the quality of patient care in the prehospital environment. A qualitative multi-case study was selected for this study because the nature of the methods' design aligned with a systematic approach of life experiences (Creswell, 2015). Paramedics who participated in this study provided insight, from life experiences, as to why one prematurely leaves EMS; thus, creating a staffing shortage. The foundation of this study is the high staffing shortages of paramedics specifically in South Carolina (SC) and North Carolina (NC). Drastically reducing paramedic attrition is critical in reducing patient suffering, decreasing morbidity and mortality, and improving EMS key performance indicators. The conceptual framework for this study aligns with Fredrick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs. In conclusion, the findings from this study have shown that the number of ambulances that are unstaffed from the paramedic shortage has reached critical levels. Primarily, this review of the literature's discovered themes has identified numerous challenges contributing to the increasing EMS paramedic shortages and their effects on patient care in the pre-hospital environment. Secondly, the interview portion of this study solidifies the discoveries of the cited works and identifies further challenges through its semi-structured interview format. Thirdly, achievable data from previous studies, primarily from the South Carolina EMS Association, validate this study's findings through triangulation; thus, instilling rigor on primary reasons for EMS paramedic shortages and their impact on patient outcomes.

*Keywords:* EMS, paramedic shortage, paramedic attrition

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**Approvals**

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### **Dedication**

This work is dedicated to my wife, Connie Hubbard-Eubanks, who encouraged me to stay focused throughout my academic studies. There were times that I felt overwhelmed trying to manage life, work, and school. Connie has been with me every step of the way in life and spirit, during sickness and health, and in all my endeavors. I am extremely blessed that God has given me a beautiful, supportive, and loving wife who has always unselfishly shared her heart with me.

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### **Section 1: Foundation of the Study**

Imagine calling emergency medical services (EMS) for help and no one came. Most individuals in the United States anticipate a rapid paramedic response when calling 9-1-1; however, some EMS agencies do not have resources, such as paramedic staffing, to promptly respond to emergency calls (Michael Allan Marion Brantford Expositor, 2017). A 2015 national study, among 486 EMS providers in the United States, on ambulance response times, showed that 10% of the EMS patients waited almost 30 minutes for ambulances to arrive on the scene of emergencies (Seaman, 2017). Furthermore, EMS directors are concerned that they will not have enough employable paramedics in the future to care for the increasing percentage of patients (Belotto, 2017). From 2009 to 2011, the number of paid and volunteer EMS workers in the U.S. increased by 3.25%; however, EMT and paramedic staffing decreased by 300% nationwide the years from 2011 through 2018 ("CDC - Emergency Medical Services Workers - NIOSH Workplace Safety and Health Topic," 2019). If these drastic trends of long EMS response times from inadequate paramedic staffing continue and EMS leaders cannot locate paramedics for hire, patients will suffer and morbidity and mortality rates will increase; thus, the reason for this study.

The foundation of this study is specifically the high staffing shortages of paramedics in South Carolina (SC) and North Carolina (NC), to understand why paramedic staffing shortages are an increasing problem, and how staffing shortages affect EMS key performance indicators (KPIs) which are the quality of patient care, employee retention, ambulance response times, EMS patients' length of hospital admissions, and patient outcomes. Baier et al. (2018) identified there is a correlation between paramedic attrition, as a condition of paramedic shortages, and a decline in the quality of prehospital patient care. Stopping the outflow of paramedics is critical in

reducing patient suffering, decreasing morbidity and mortality, and improving EMS' KPIs.

Strategies to improve healthcare shortages are best achievable by identifying and implementing goals to reduce workforce attrition (Castro Lopes et al., 2017) that contribute to longer ambulance response times and endangers patients' lives (Sridhar, 2018). To fulfill the needs of the increasing patient population while meeting KPIs, EMS leaders must define what interventions have the greatest influence on paramedic retention, determine why there are not enough quality paramedics to fill EMS needs, identify factors that have the greatest impact on attrition, and interpret what extent paramedic retention influences KPIs.

### **Background of the Problem**

The background of the problem is the excessive paramedic staffing shortage. There seems to be a strong correlation between EMS paramedic shortages, employee burnout, unpleasant work environments, and the negative impact of KPIs which are employee attrition, longer ambulance response times, a paucity of care, increased length of hospital admissions, and higher patient morbidity and mortality rates. Paramedic burnout in EMS is an integral factor of attrition that is linked to workforce engagement and contributes to the quality of patient care (Boland et al., 2019). Paramedics who work in EMS experience emotional events that contribute to post-traumatic stress disorder (PTSD) and compassion fatigue which hastens paramedic job burnout (Miller et al., 2018). Paramedic burnout, a contributor to attrition, can be attributed to an accumulation of long hours, low wages, high call volumes, and patient trauma (Sridhar, 2018).

To decrease the paramedic staffing shortage and improve the quality of patient care in the out-of-hospital environment, EMS directors must determine the causes leading to staffing shortages and implement interventions to improve organizational performance. Some factors affecting staffing shortages have been identified as paramedic burnout because of accumulative

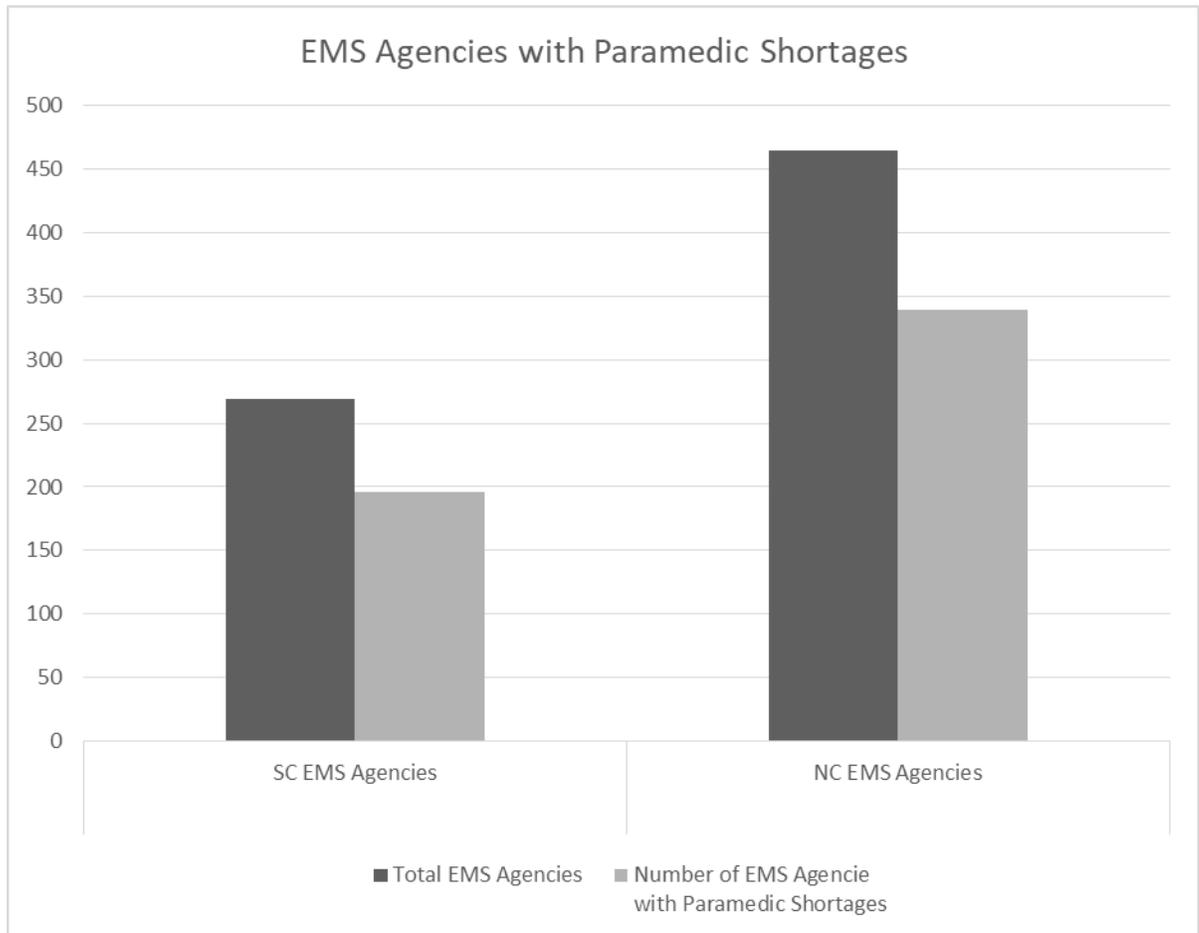
stress from traumatic experiences (Boland et al., 2019; Miller et al., 2018), the lack of management appreciation (Miller et al., 2018), obscure prestige, inadequate public respect (Majchrowska et al., 2021), unpleasant work environments, the lack of promotional opportunities, inadequate benefits, and low wages (Belotto, 2017). Additionally, many paramedics are leaving EMS because of the physical demands of the job such as consistently carrying heavy patients and equipment, job offers in another career, or personal relationships (Belotto, 2017).

The main purpose of this research identifies the primary causes of the paramedic shortages specifically in SC and NC and recommends ways to reduce the staffing shortage. Most paramedics in the United States quickly burn out because of the long hours or the lack of administrative support (Boland et al., 2019). Numerous paramedics have resigned from EMS because of stress-related burnout, compassion fatigue, and PTSD because of accumulative stress from their traumatic experiences (Miller et al., 2018). Psychological problems or the lack of administrative support that contribute to the high attrition rates among paramedics negatively impact patient care (Baier et al., 2018). Primary factors contributing to paramedic burnout in SC and NC are important components that were identified during this study. In summary, research on the staffing shortages in EMS helps by addressing EMS KPIs which were identified as the quality of patient care, employee retention, delayed ambulance response times, EMS patients' length of hospital admission, and EMS patient outcomes. Figure 1 is a bar chart comparison representing the number of ambulance agencies experiencing paramedic staffing shortages in SC and NC. The SC and NC Continuum's "State Data Sheet" (2019) shows there are 269 EMS and ambulance companies in SC and 464 EMS and ambulance companies in NC. Seventy-three

percent (73%) of the EMS agencies in the Carolinas are experiencing paramedic shortages (Osby, 2019).

**Figure 1**

*EMS Agencies in South Carolina and North Carolina with Paramedic Shortages During 2018*



*Note.* Data from State Data Sheet (n.d.) retrieved from <http://www.emspic.org/continuum> and “EMS Faces Challenge in Adding Workers: Action Needed to Prevent Staffing Crisis Nationwide,” by Osby (2019).

**Problem Statement**

The general problem addressed during this study is the increasing staffing shortage of paramedics that is resulting in a negative impact on the quality of patient care. In the 2018

national study by the American Ambulance Association, the turnover rate of one-in-four paramedics is an increasing problem in the United States (Osby, 2019). Almost three-fourths of the 733 EMS agencies and private ambulance providers in the Carolinas are experiencing paramedic shortages because there are not enough qualified job candidates to satisfy the needs (Osby, 2019). One study predicts that by the year 2030, there will be a critical shortage of healthcare workers and paramedics to care for the increasing number of patients (Castro Lopes et al., 2017). The specific problem addressed is that the EMS paramedic shortage in the states of SC and NC is contributing to a drastic decline in the quality of prehospital patient care.

### **Purpose Statement**

The purpose of this qualitative case study adds to the body of knowledge by expanding on the understanding of the reasons for paramedic staffing shortages in EMS. The reason why it is so important to overcome the paramedic staffing shortages in the EMS industry is because of the effects it has on patient care in the out-of-hospital setting. EMS paramedics are challenged with the ability to think critically, display good judgment, recall clinical knowledge, produce psycho-motor skills effectively during time-sensitive emergencies, and maintain reflexes during ambulance operations and scene management (Corman, 2019). During staffing shortages, paramedics often work extended shifts, and they are often forced to work overtime, thus reducing their situation awareness and their ability to think critically (Backberg, 2019).

This study is critical to SC and NC because the problem ultimately affects patient care in these areas that have been identified as having high medical needs. One example to illustrate the need for this study is the drastic number of patients who suffer from strokes. “Stroke is a leading cause of disability and the fifth leading cause of death in the USA” (Harris et al., 2020, p. 1). In the United States, every year someone suffers a stroke every 40 seconds, someone dies from a

stroke every four minutes; it is the leading cause of disability affecting 795,000 sufferers, the fifth leading cause of death killing 140,000 people, and costs \$34 billion (“Stroke Facts,” 2020). Since 1965, the Center for Disease Control has identified SC and NC as two of the eight states with the highest stroke mortality rates, also referred to as “the stroke belt” (Howard & Howard, 2020, p. 742).

Timely first response and rapid patient transport to a hospital with a stroke center are critical in reducing disability and death from stroke (Powers et al., 2018). To reduce mortality and morbidity in the Carolinas, EMS agencies must stop the outflow of paramedics. There are experienced industry professionals who believe the shortage of paramedics can be addressed by introducing new and exciting career advancement opportunities in EMS. This study has discovered several reasons for the paramedic shortage and the findings have helped identify recommendations that are expected to reduce the shortage of paramedics in SC and NC.

### **Research Questions**

The research questions have identified the primary reasons for the paramedic shortages, specific to SC and NC, through the discoveries of several reasons that have influenced paramedics to voluntarily terminate their employment. Additionally, the research questions have determined that the reasons for the paramedic shortages in the Carolinas are consistent with the reasons for the paramedic shortages in the United States, which are accumulative stress from low pay, traumatic experiences, inept management, lack of advancement opportunities, long hours, stressors of the job, lack of respect, poor working conditions (Boland et al., 2019; Miller et al., 2018), the lack of management appreciation (Miller et al., 2018), obscure prestige and inadequate public respect (Majchrowska et al., 2021).

1. What primary factors influence paramedic shortages in the states of South Carolina and North Carolina?
  - a. What interventions would have the greatest influence on paramedic retention for EMS agencies in South Carolina and North Carolina?
  - b. What factors have the greatest impact on EMS paramedic attrition in South Carolina and North Carolina?
  - c. What interventions would have the most impact on recruiting newly certified paramedics for EMS agencies in the states of South Carolina and North Carolina?
2. What primary factors influence paramedic tenure?
  - a. To what extent can historical data and trends of EMS provide a foundation for predicting a staffing model to meet future needs?
  - b. To what extent does paramedic tenure influence paramedic longevity with an EMS agency in South Carolina and North Carolina?
  - c. To what extent does paramedic experience, through tenure, influence EMS Key Performance Indicators?

### **Nature of the Study**

This research project was a qualitative multi-case study. Qualitative studies provide researchers with opportunities to receive answers based on human experiences as identified by specific research questions to gain a greater knowledge of conditions that influence certain factors (Gelling, 2015). In qualitative studies, researchers explore a situation, event, or individual ascribing a human or social problem (Creswell & Creswell, 2018) through an open-ended methodology that was guided by the research paradigm of the researcher's worldview.

### ***Discussion of Research Paradigm***

This research study was guided by positivism, or the positivist paradigm. “Research paradigms guide scientific discoveries through their assumptions and principles” (Park et al., 2020, p. 690) which are shaped by the researcher’s view of the world. “Positivism often aligns with quantitative research; however, qualitative studies can also align and benefit from positivism (Park et al., 2020) “to receive knowledge from human experience” (Turyahikayo, 2021, p. 212). The paramedics, who were chosen to participate in this multi-case study, drew from their personal experiences to provide truthful data concerning numerous challenges they encountered while working in the EMS industry. Positivism, this researcher’s worldview, is a single objective of reality because there is only one version of the truth. Proverbs 14:25 (New International Version) teaches, “A truthful witness saves lives, but a false witness is deceitful.” The Bible, which is all truth, has firmly established a solid foundation for this study; thus, aligning with positivism.

### ***Discussion of Design***

In this study, both current and previously employed EMS paramedics were interviewed to identify factors contributing to attrition. Information that was obtained from the participants’ individual experiences was categorized into themes and codes were developed to define why paramedics terminated their positions entirely, why they changed EMS employers or their reasoning for wanting to leave the industry. Individual interpretation of experiences has driven the discovery of factors that are impacting paramedic staffing shortages and recommendations for interventions to help improve paramedic retention are addressed in the findings of this study. In qualitative studies, the original information is often a set of field notes entered into a database consisting of episodes pertinent to historical events and field actions, specific opinions,

reasonings or explanations, and specific details or other meanings identified by participants who have personal experiences in the topic being studied (Yin, 2016). The data are usually collected, analyzed, and interpreted from themes during personal interviews with pertinent individuals or focus groups (Creswell & Creswell, 2018).

A quantitative method or mixed-method research was not chosen for this study because quantitative research requires a structure of measurements, statistical data, or numeric data analysis from polls. A disadvantage of quantitative research is that participants do not have the autonomy to fully express in-depth details to research questions (Trochim et al., 2016). Quantitative research is best suited to test theories by measuring the relationship between variables (Creswell & Creswell, 2018). In a mixed-method study, a researcher combines quantitative and qualitative methods to broaden the research conclusions' breadth and depth (Schoonenboom & Johnson, 2017). A mixed-method design provides a clearer understanding of research conclusions in comparison to isolated qualitative or quantitative research (Creswell & Creswell, 2018). The framework of mixed-method research uses the combined structures of qualitative and quantitative measures to interpret a study's conclusions (Creamer, 2018); therefore, a mixed-method study is impractical because quantitative measures do not apply to this study.

### ***Discussion of Method***

A qualitative case study was selected because of the nature of the methods' design to provide a systematic approach to life experiences (Creswell, 2015). In particular, the life experiences of paramedics have given insight as to why one prematurely leaves EMS; thus, creating a staffing shortage. Additionally, this study has relied on data collected through the following characteristics of the qualitative study design.

**Table 1***How Data Were Collected*


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Data Collection Characteristics
<ul style="list-style-type: none"> <li>• Multiple sources of data           <ul style="list-style-type: none"> <li>○ Interviews of current and former paramedics of SC and NC.</li> <li>○ Observations of the work environment of the paramedic field.</li> <li>○ Documents to provide further insight into trending paramedic response times.</li> </ul> </li> <li>• Participant’s meanings           <ul style="list-style-type: none"> <li>○ Focus is given to the meaning that participants hold about the problem. In this case, the meaning paramedics of SC and NC (participants) of the study hold about the problem of the study which is the staffing shortage of paramedics in SC and NC.</li> </ul> </li> <li>• Emergent design           <ul style="list-style-type: none"> <li>○ The plan and phases of the study were subject to shifting because of the data collected, responses of participants, or the environment studied; however, there was no indication to shift the plan or phases at any time or point of reference during this research project.</li> </ul> </li> </ul>

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*Note.* Data Collecting Characteristics from Creswell (2015).

***Summary of the Nature of the Study***

A study’s design provides structure and strengthens a research project (Trochim et al., 2016). A multi-case study was the chosen design for this qualitative study because an exploratory analysis was sought from “why” and “how” themes. According to Yin (2018), case study designs are best suited for qualitative research seeking answers to “why” and “how”

questions. A case study design provides opportunities for researchers to conduct in-depth studies on the behavior of a specific group, life cycles of an individual, managerial structures, organizational processes, or maturation of industry to explore how something happens (Yin, 2018). McKinley and Rose (2020) described a “case” as interpretive research involving an individual or target group.

Two research designs that were not practical for this study are phenomenological and grounded theories. The phenomenological design is a philosophical and psychological structure in which a researcher studies and describes a phenomenon by interviewing participants who personally experienced the phenomenon (Creswell & Creswell, 2018). The purpose of a phenomenological research design is to study specific events by interviewing individuals who experienced the events (Larkin et al., 2019). Grounded theory design is a systematic research approach in which theories are constructed from reasoning and then evaluated during future experiments or experiences (Flick, 2019). With grounded theory, data are collected during the study to define and develop concepts and theories (Corbin, 2017).

### **Conceptual Framework**

The conceptual framework for this study was based on the models of Frederick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs. These ideologies of both models hold that employee retention is influenced by rewards, recognition, human needs, and satisfaction (Vipperman, 2019).

#### ***Herzberg's Two-Factor Theory of Motivation***

In Herzberg's Two-Factor Theory of Motivation model, Herzberg (1959) defined an individual's job satisfaction as one's “overall attitude toward his job, whether he likes or dislikes it” (p. 5). Herzberg's first concept identifies employee motivators (Vipperman, 2019) where

employees are inspired by intrinsic factors of achievement, work satisfaction, challenges, and job responsibilities (Herzberg, 1968). Herzberg's second concept is "hygiene or maintenance factors" (Vipperman, 2019, p. 14) which are defined as extrinsic factors of compensation, job security, work status, and working conditions (Herzberg, 1968). Paramedics are motivated by Herzberg's intrinsic factors; however, they are demotivated by a lack of extrinsic factors (Peterson, 2019).

Herzberg's motivational factors align with this study by defining motivational factors of EMS paramedics and to what extent the absence of motivators contributes to paramedic shortages. A lack of job satisfaction is the leading predictor of employee attrition among government workers (Pitts et al., 2012). This is significant to the study considering the number of paramedics who are leaving EMS is increasing (Alexander et al., 2009). Occupational stress and negative job conditions affect employee physical health and contribute to employee job dissatisfaction (Kuykendall & Tay, 2015). Many paramedics suffer from accumulative occupational stress and become dissatisfied with their jobs because of the extended duty times from late EMS calls, heavy call volumes during shifts, and completing patient care reports (Backberg, 2019).

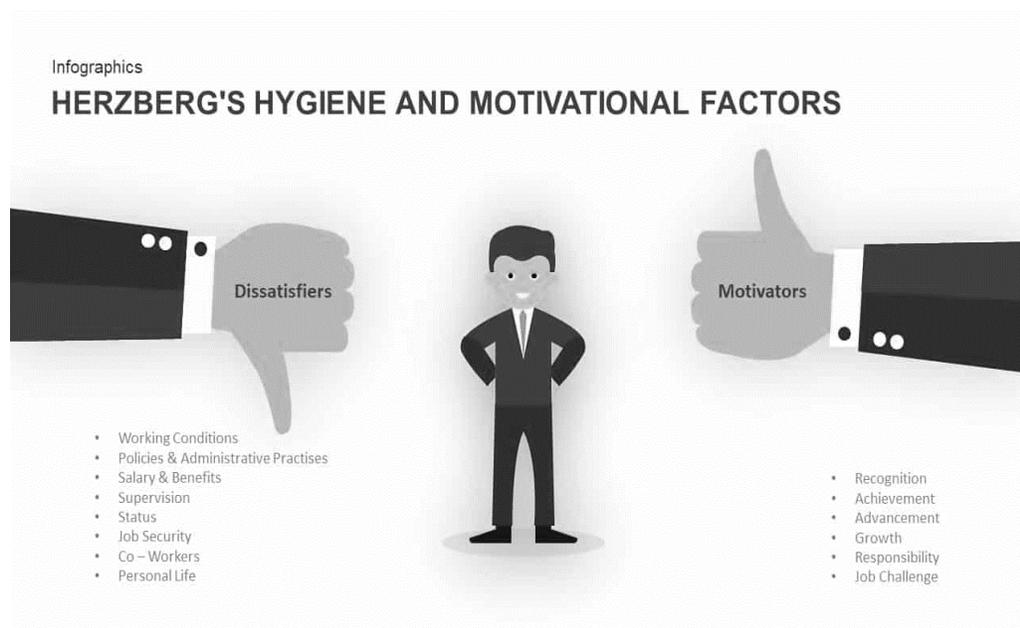
Compensation, an extrinsic factor of Herzberg's model, is linked to the ability or the inability to "recruit and retain" employees (Studnek & Crowe, 2016, p. s87). According to the 2018 U.S. Bureau of Labor Statistics, EMS workers in the United States are paid an hourly salary of \$16.05 hourly, or 40% less than what the average American worker earns, and EMS is reported as one of the worst-paying medical jobs in the United States (Bahler, 2018). In May 2018, the median annual salary for paramedics was \$34,570 in SC, \$36,200 in NC, and \$34,320 nationwide which was less than the national median annual salary of \$38,640 for all other

medical and non-medical occupations combined (U.S. Bureau of Labor Statistics, 2018). In May 2019, the median annual salary was \$34,670 in SC, \$38,270 in NC, and \$35,400 nationwide (U.S. Bureau of Labor Statistics, 2019).

Herzberg's Two-factor of employee motivation defines hygiene factors and motivators as factors that either contribute to employee dissatisfaction or employee motivation. Employees are demotivated by poorly managed or the absence of Herzberg's hygiene factors; however, they are motivated by the presence of Herzberg's motivational factors (Herzberg's Hygiene and Motivational Factors PPT, 2019).

## Figure 2

### *Herzberg's Two Factor Theory of Motivation*



*Note.* Retrieved from Herzberg's Hygiene and Motivational Factors PPT (2019).

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### ***Maslow's Hierarchy of Needs***

According to Abraham Maslow's Hierarchy of Needs, employees are motivated by "D-needs" which are "physiological, safety and security, love and belongingness, and esteem" or "B-needs" identified as "self-actualization" (Acevedo, 2018, p. 744). Paramedics' work environments include accumulative stress from psychological traumatic experiences that are linked to the critical medical and trauma conditions of specific patients (Miller et al., 2018). The review of the literature has discovered that paramedics experience "hazardous physical work environments, non-optimal workloads" (Kuykendall & Tay, 2015, p. 4) from extended shifts, and they "are at high risk of occupational illness and injury" (Studnek & Crowe, 2016, p. s88). EMS paramedics who work 12- or 24-hour duty shifts often suffer from sleep deprivation which is shown to be linked to obesity, cardiovascular disease, hunger or changes in appetite, gastrointestinal problems, metabolic disorders, and emotional changes (Backberg, 2019). Because of the long hours, stressful working conditions, and low wages in comparison to the education and credentialing requirements; the paramedics' highly demanding work environment and occupational conditions are not conducive to meeting the basic human needs of physiological, safety and security, esteem, and "self-actualization" (Acevedo, 2018, p. 744). When employers routinely fail to meet their employees' needs that are identified by Abraham Maslow's Hierarchy of Needs, these employees easily become demotivated and often search for other employment opportunities outside the organization (Acevedo, 2018).

### ***Herzberg's Theory and Maslow's Hierarchy of Needs***

Herzberg's Two-Factor Theory of Motivation often produces enormous benefits in public organizations, such as EMS, when employees "experience such feelings as achievement, recognition, and responsibility at work" (Hur, 2018, p. 330). As defined by Abraham Maslow's

Hierarchy of Needs, peoples' needs must be met through self-actualization and self-fulfillment (D'Souza & Gurin. 2017). Under Herzberg's Motivational Hygiene Theory, motivational factors produce employee job satisfaction when met while the hygiene factors contribute to "job dissatisfaction if they are not met at an organization" (Peterson, 2019, p. 4). Additionally, this study aligns with Maslow's Hierarchy of Needs by investigating how paramedics' needs are satisfied. When evaluated against Maslow's Hierarchy of Needs, defined as "D-needs" and "B-needs," the paramedic's work environment fails in meeting the basic human needs of physiological, safety and security, esteem, and "self-actualization" (Acevedo, 2018, p. 744; "What is Human Resources," 2018).

### ***Summary of the Conceptual Framework***

This study has discovered several conditions that align with Herzberg's Two-Factor Theory Model and Maslow's Hierarchy of Needs, as to why EMS agencies in SC and NC are experiencing high paramedic shortages and how these conditions relate to the existing knowledge that the shortage of paramedics negatively affects patient care. Herzberg's theory has been used to study employee job satisfaction in numerous healthcare professions, firefighters, and EMTs; however, "it has not yet been used to study job satisfaction specifically among paramedics" (Peterson, 2019, p. 18). By applying the concepts from Herzberg's Two-Factor Theory Model and Maslow's Hierarchy of Needs to the data obtained from this study, a better understanding of the correlation between paramedic shortages and EMS KPIs, including patient care, has been identified.

Figure 3 is a comparison between Maslow's Hierarchy of Needs and Herzberg's Factor Theory of Motivators and Hygiene Factors. In Maslow's Hierarchy of Needs pyramid, self-actualization and esteem are equivalent to Herzberg's Two Factor Motivators of achievement,

recognition, work itself, responsibility, and advancement. Maslow's Hierarchy of Needs belonging and love, safety, security, and basic physiological needs are equivalent to Herzberg's Hygiene Factors of interpersonal relations, company policy or administration, supervision, salary, and working conditions ("Herzberg's Two Factor Theory," 2018).

### Figure 3

*Maslow's Hierarchy of Needs and Herzberg's Two Factor Theory Comparison*



*Note.* Retrieved from <http://www.whatishumanresource.com/herzberg-two-factor-theory>.

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## Definition of Terms

The purpose of the definition of terms in this research is to describe the meaning of specific words that are prevalent in this study of EMS Attrition. A definition of specific terms includes:

***Advanced EMT:*** Prehospital patient care providers who have additional training in advanced airway skills and intravenous cannulation in addition to EMT training. Individuals who perform advanced care must work under a physician to provide their advanced skills. Advanced EMTs apply a few specific advanced sets of procedures, in addition to EMT skills, to treat patients who suffer from an acute illness or injury requiring ambulance transport to an emergency department or other healthcare facilities (“The National EMS Scope of Practice Model,” 2019).

***American Ambulance Association:*** The American Ambulance Association is an EMS organization with the mission to promote EMS policies, procedures, and research to assure excellence in prehospital care. The organization was founded in 1979 and is in McLean, Virginia.

***Ascribing:*** A cause for an event or situation.

***Certification:*** The act, in the form of an official document, that a state agency provides to an individual in assuring that minimal medical competencies are met to provide efficient and safe patient care (“The National EMS Scope of Practice Model,” 2019).

***Compensation:*** For this research, compensation describes a monetary hourly rate of pay rather than total compensation which includes the accumulation of employees’ benefits packages. Compensation, as a term in this study, is only the cash wages paid to EMS workers as their base hourly pay rate and includes both scheduled and unscheduled overtime pay.

***EMS system abuse:*** The repeated use of EMS by patients who frequently call 9-1-1 for reasons, complaints, or chronic illnesses that are identified as medically unnecessary and do not require urgent or emergent transport to an emergency department by an ambulance.

***EMT:*** The basic prehospital patient care providers who hold a local or state certification to provide treatment to patients who suffer from an acute illness or injury require ambulance transport to an emergency department or other healthcare facilities (“The National EMS Scope of Practice Model,” 2019).

***Employee attrition:*** A reduction of staffing through volunteer resignations, involuntary terminations, retirement, termination of employee contracts, or downsizing of staffing. Employee attrition during this study is isolated to the paramedics who have voluntarily resigned from their positions in EMS.

***Fatality:*** Death contributed to accidents, war, or disease.

***Job burnout:*** A psychological condition experienced by employees is linked to numerous factors such as job-related stress, physical and emotional exhaustion, inadequate compensation, long hours, inadequate downtime for rest, sleep deprivation, lack of appreciation from managers and patients, inconsistent work-life balance, and EMS system abuse.

***Medical futility:*** Medical treatment or interventions that are unlikely to produce positive patient outcomes, care that offers limited to no benefit in improving patients’ medical conditions, or any factors that cause patient mortality or morbidity.

***Morbidity:*** A worsening medical condition is caused by medical errors, improper treatment, or negligence. Morbidity may or may not lead to mortality.

***Mortality:*** Death from a specific cause, or specific medical treatment that is deemed incorrect or linked to negligence.

***Motor vehicle crashes:*** Motor vehicle crashes are not identified as accidental. In most cases, they are the result of negligence. Although the 1966 EMS white paper classified motor vehicle crashes in the category of accidents (Accident Death and Disability: The Neglected Disease of Modern Society, 1997), automobile manufacturers shift the cause as preventable by the operators of the vehicles. In a 1965 Consumer Report article, the National Safety Council statistics categorized vehicle crashes as non-accidental and contributed by driver errors (Kelley, 2017).

***Myocardial infarction:*** Heart attack. Death of a portion of the heart muscle. Symptoms of a myocardial infarction often include chest discomfort, left arm or hand pain, shortness of breath, and nausea. Myocardial infarctions can be fatal without immediate life-saving interventions in a PCI center or “percutaneous coronary intervention.” An individual can suffer a “silent heart attack” which can cause sudden death without warning.

***Paramedic:*** Prehospital or emergency department patient care providers who are certified at the highest level in comparison to EMTs and advanced EMTs. Paramedics must work under the license of a physician who is familiar with EMS standards and protocols. Paramedics provide skills at the basic EMT level, the advanced EMT level, and additional advanced skills including cardiac monitoring to interpret and diagnose patient conditions, administer medication, and other advanced skills to provide patient care at the highest level (Mulholland et al., 2020; “The National EMS Scope of Practice Model,” 2019).

***Paucity:*** Shortages, deficits, deficiencies, or a lack of something. Paucity defines a product, personnel, or a lack of the quality of service provided.

**Reflexivity:** A cognitive process is when an individual identifies and articulates a relationship between cause and effect based on specific situations witnessed events or life experiences.

**SC and NC Continuum:** A data tracking system used by the SC Department of Health and Environmental Control's Division of EMS and NC Office of EMS that tracks real-time updates of paramedic certifications, current EMS and ambulance companies that are currently licensed in SC or NC, and other statistics and data such as ambulance call volumes and procedures reported by each agency licensed in the states of SC and NC Continuum is the EMS Performance Improvement Center (EMSPIC) to monitor, promote, and assure that pre-hospital patient care standards are maintained by pre-hospital EMS agencies and EMS workers providing patient care in the pre-hospital setting and during interfacility transfers when patients are transported by ambulance from one medical facility to another.

**Synchronicity:** A coincidental series of unexpected events that seem related to previous events or situations (Merriam-Webster, n.d.).

**U.S. Bureau of Labor:** A federal agency of the U.S. Department of Labor is responsible for measuring labor market statistics, data, activities, working conditions, salaries, and price changes in specific trades, the economy, and organizations.

**Wages:** The initial rate of pay, usually an hourly monetary amount, employers give employees before taxes and other deductions.

### **Assumptions, Limitations, Delimitations**

Assumptions of this research are accepted as factual by individuals who will read this study; however, some of the data may have been generated from theories. Because assumptions are often controllable, they can be eliminated. Assumptions are necessary for this research

because the elimination of information or data that stems from theories would make this study irrelevant. Limitations are weaknesses in this research and are uncontrollable. Delimitations in this research are the controllable factors of boundaries and limitations throughout this study.

### ***Assumptions***

When conducting this qualitative study, it was assumed that all individuals who participated in the research answered all questions truthfully, without bias, and they provided specific answers to every question. Although the findings from this study were perceived as the truth, the qualitative research design relied on the participant's perception, logical thinking, and experiences.

### ***Limitations***

Locating paramedics who remained credentialed at either the national level or state level was accessible through a database. Identifying a full scope of reasons for attrition becomes complex, and sometimes impossible, for researchers when they are attempting to locate previously certified paramedics who are no longer credentialed at the national or state levels and to better understand why they quit EMS to work in another profession. A limitation existed when interviews of EMS paramedics were limited to those who were receptive to the study design by answering all questions openly and honestly. Data collected and categorized from survey participants were interpreted as data representing the paramedic profession.

### ***Delimitations***

A study on paramedics' shortages in SC and NC was chosen as a research project because of the chronic and ongoing problems, specifically high employee attrition, in EMS which negatively affects KPIs. This research sought to identify the percentage of paramedics who have tenure with a specific EMS agency, paramedics who quit their jobs to work for another

EMS agency offering higher pay, paramedics who chose to leave EMS to work in a similar position such as emergency departments, and paramedics who chose to pursue more profitable, less stressful, and less demanding positions in non-EMS related industries. In summary, there are many studies on EMS paramedic shortages and their effects on the quality of patient care in the out-of-hospital environment. The population for this study was selected through the SC Department of Environmental Control's Division of EMS and the NC Office of EMS databases to help identify individuals who either work or have previously worked as a paramedic in either SC or NC.

### **Significance of the Study**

The significance of this study is to describe to the reader the problems of EMS attrition and who will ultimately benefit from the results of this research. If these problems continue and are never addressed, patient care will suffer; therefore, causing higher morbidity and mortality rates because of numerous operational KPI shortcomings including decreases in ambulance response times and the quality of patient care. By addressing and implementing strategies to combat the problems of paramedic shortages, the key beneficiaries of this study will be those who use the services of paramedics. The public is unaware that they are often treated by prehospital care providers who have been up for 24 hours straight. Moreover, patients do not want to be treated by inexperienced paramedics who have substandard cognitive knowledge, poor psychomotor skills, or those who are rushed through new employee onboarding only to fill open EMS positions. This study will benefit EMS directors and other managers, paramedics, and state legislators.

### ***EMS Directors and Frontline Managers***

Data given by paramedics will provide EMS directors and frontline managers with the reasons for paramedic shortages. The study provides an outlook on job burnout among EMS workers, offers several recommendations to combat burnout, provides ways to recruit and retain employees, and offers recommendations and resources for EMS agencies to implement to help employees manage their physical and psychological injuries. Numerous research studies are investigating the symbolic meaning of the work that paramedics provide to their patients and the coping resources and strategies that these caregivers are relying on to cope with the physiological injuries they suffer from traumatic experiences while performing their duties (Corman, 2018).

### ***Paramedics***

This study addresses challenges that increase paramedic attrition and attempt to prepare paramedics for a long and healthy career in EMS. This research provides several recommendations to help these clinicians become more aware of the problems caused by excessive staffing shortages. Through this study, paramedics are informed about the importance of safety and the long-term benefits of developing and maintaining a long and prosperous work-life balance to remain physically, mentally, and emotionally healthy. This study has revealed that accumulative stress encountered by paramedics is damaging to their health. The job of being a paramedic changes him physically, mentally, and emotionally (Sridhar, 2018).

### ***State Legislation***

State legislators should be concerned about the significance of the problems in EMS such as the causes, effects, and results of high paramedic shortages. Because legislators are elected by the public, they should be motivated to address these problems and implement goals to solve the

problems that negatively affect patient care and improve the overall safety and wellbeing of the public, or risk being replaced by politicians who will.

### **Literature Review Outline**

- I. The History of EMS
  - a. The Inception of Paramedics
  - b. EMS in the Future
  - c. A Transition from Current to Future Developments in EMS
- II. Paramedic Stressors and Job Burnout
  - a. EMS Stressors that Contribute to Paramedic Burnout
  - b. How Burnout Increases Paramedic Attrition
- III. Paramedic Shortages
  - a. Why Paramedics Leave EMS
  - b. Employee Motivator and Demotivator Factors.
  - c. EMS Paramedic Retention
- IV. Paramedic shortage and its Effects on EMS Key Performance Indicators (KPIs)
  - a. How paramedic staffing shortages Affect Patient Care
  - b. Factors that Increase Patient Morbidity and Mortality in the Out-of-Hospital Environment
  - c. EMS Organizational Performance Dilemmas.

### **Review of Literature**

The goal of this review of the literature was to investigate paramedic shortages, substantiate reasons for the high EMS paramedic shortages primarily from attrition, and assist in making recommendations to stop the outflow of paramedics; thus, improving patient care. The

literature collected for this review has provided a foundation for this research project, added to this study's findings by promoting validity and reliability, and has helped to define what extent the paramedic shortage impacts the quality of patient care. It was discovered that the challenges that increase paramedic attrition are influenced by two theories that were identified as the study's conceptual framework, which are Herzberg's Two-Factor Theory of Motivation and Maslow's Hierarchy of Needs. The purpose of this qualitative case study was to add to the body of knowledge by expanding on the understanding of the reasons for paramedic staffing shortages in EMS. The purpose of the literature review was to evaluate EMS paramedic shortages and their effects on the quality of patient care in the out-of-hospital environment through discovered themes.

In Herzberg's Two-Factor Theory of Motivation, employees are primarily inspired by intrinsic factors of achievement, work satisfaction, challenges, and job responsibilities (Herzberg, 1968). Additionally, employees' needs are met by Abraham Maslow's Hierarchy of Needs which are "physiological, safety and security, love and belongingness, and self-actualization" (Acevedo, 2018, p. 744). Companies that help their employees achieve Abraham Maslow's Hierarchy of Needs have more productive employees, employee opinion surveys are good, and attrition is low (Phillips, 2018). This review of literature evaluates correlations between EMS paramedic shortages and the conditions contributing to occupational burnout which Miller et al. (2018) identify to be untreated occupational stress, unpleasant job conditions, and PTSD from traumatic experiences.

In the absence of Herzberg's intrinsic and extrinsic motivational factors, employees become demotivated to perform their duties (Peterson, 2019; Viperman, 2019). This study has shown that paramedic retention improves when Herzberg's Two-Factor Theory of Motivation

and Maslow's Hierarchy of Needs are met, and attrition increases when Herzberg's Two-Factor Theory of Motivation and Maslow's Hierarchy of Needs are lacking. Further examination of this review has discovered that the paramedic shortages in EMS are linked to inferior KPIs such as longer ambulance response times and a decline in the quality of patient care. The review of literature has helped to discover several recommendations that can help shape short-term and long-term goals to combat the problems that are contributing to paramedic shortages in EMS, thus drastically reducing morbidity and mortality in the prehospital environment.

### **The History of EMS**

This review of literature on the history of EMS has intensified the discoveries identified during this project by developing a better understanding of the need to recruit and retain paramedics in the industry to assure that the public's needs are met, the importance of the most modern technology to help decrease ambulance response times, state-of-the-art equipment to improve patient care, and it predicts a paramedic staffing model to meet future needs which have shown to reduce morbidity and mortality in the prehospital environment. The history of modern EMS is credited to centuries of military influence (Belotto, 2017). Even as far back as the ancient times of Romans, Egyptians, Greeks, and Babylonians, codes of medical conduct were introduced for medical providers to render care in whatever form existed (Van Hoven, 2019). During conflicts of the Napoleonic and Crimean wars, in the late 1700s to early 1800s, practices of prehospital care, field triage, and critical care patient transport were in use (Van Hoven, 2019).

In the late 1960s to early 1970s, civilian ambulances in the U.S. were operated by funeral homes in which patients were transported to hospitals in hearses and without any pre-hospital care other than basic first aid (Belotto, 2017). "Ambulance drivers" in the 1960s relied on their

skills of driving fast and providing comfort around chaos (LaCroix, 2015). While EMS has drastically improved since its inception over 50 years ago, Christensen et al. (2017) stated that the pre-hospital knowledge regarding patient diagnosis and outcomes is still limited. Modern ambulances often provide rapid patient transport to local hospitals and trauma centers; however, multi-trauma patients in outlying geographical areas of the country often need to be airlifted, by helicopter EMS (HEMS), to trauma centers (Chen et al., 2018). HEMS paramedics have more advanced training in comparison to ground EMS paramedics (Taylor et al., 2018).

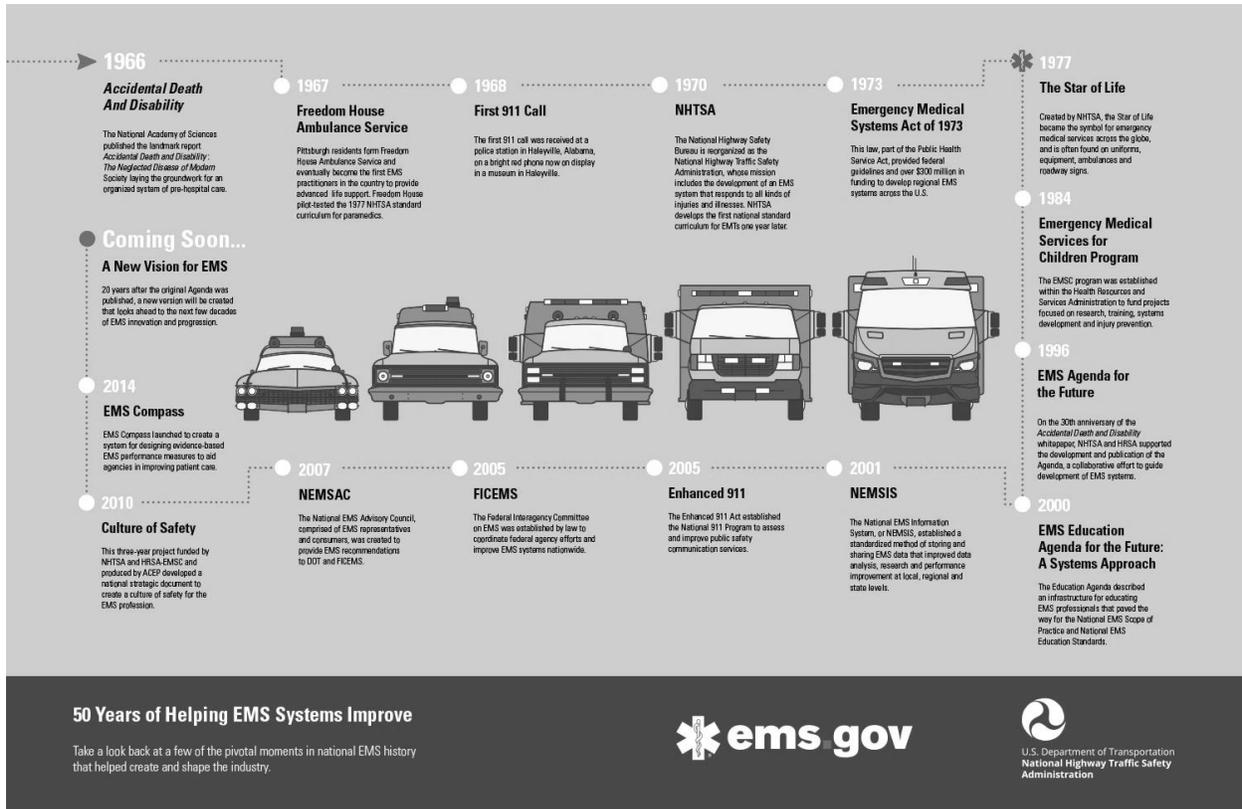
In the mid-1900s, U.S. military conflicts on foreign soil paved the way for the more advanced and time-sensitive HEMS patient transports (Benitz, 2019). During the Korean War, the U.S. military relied on the Bell H-13 Sioux “helicopter medical evacuation (MEDEVAC)” (p. S10) to quickly transfer wounded soldiers from front-line battlefields “to mobile army surgical hospitals (MASHs)” (Barr & Montgomery, 2019, p. S10). The mortality rate of American soldiers went from 30% during World War II to 25% during the Korean, Vietnam, and Gulf wars, because MEDEVAC drastically reduced patient transport times to MASH facilities (Magnuson, 2016). While the U.S. military relied heavily on combat medics and MEDEVAC to reduce mortality among American servicemen who were injured in Vietnam, there were no paramedics to care for the sick and injured men, women, and children who were needlessly dying on roadways in the United States (Belotto, 2017). Between 1959 and 1972, more than 58,000 American soldiers lost their lives in Vietnam (Hershberg, 2019); meanwhile, there were 649,988 lives lost on America’s highways during this same period of the Vietnam War (“Motor Vehicle Traffic Fatalities and Fatality Rates, 1899-2017,” 2019).

Research on the history of EMS will help improve patient care, potentially recruit more paramedics, and identify improvements that can aid in reducing patient morbidity and mortality

in the prehospital setting. This review of literature on the history of EMS, along with the additional research components of this case study, findings has clearly shown that EMS has not progressed to meet current and future needs. Figure 4 shows the history of EMS in the United States. Because EMS has fallen behind in paramedic compensation, technology, and progressive solutions to satisfy paramedics' professional and personal needs, as identified by Herzberg's Two-Factor Theory of Motivation and Maslow's Hierarchy of Needs, the industry is experiencing critical staffing shortages of paramedics leaving it unable to manage the workload. EMS paramedics undergo extensive training to manage any prehospital emergency, and they have the desire to care for patients who are suffering from extensive traumatic and medical conditions; however, they can easily become demotivated, their performance can decline, and they often leave the industry when personal and professional needs are not met. Employees become demotivated and dissatisfied with their jobs when environmental or hygiene factors "are not met at an organization" (Peterson, 2019, p. 4). Per Dr. Thomas Gilbert - Human Performance Technologist - 75% of employee performance is environmentally related.

**Figure 4**

*Timeline of the History of Emergency Medical Services in the United States*



*Note:* (“The History of EMS at NHTSA,” n.d.). Retrieved from <https://www.ems.gov/OEMShistory.html>. Figure 4 is under Fair Use. Copyright Disclaimer under Section 107 of the Copyright Act that subsequent; Allowance is made for “Fair Use” for purposes such as criticism, comment, news, reporting, teaching, scholarship, and research. Fair use is a use permitted by copyright status that might otherwise be infringing.

***The Inception of Paramedics***

Understanding the need for paramedics who are trained to provide advanced emergency care in the field is a historically recent practice (Varghese, 2020). In the mid-1960s, the role of the civilian paramedic came into existence when the U.S. Government identified that there was a need and proposed a solution. Imagine living in the 1960s and driving through an automobile

crash where you cannot distinguish the difference between mutilated bodies or twisted metal, there were no paramedics to call for help, and cell phones were nonexistent. Now, fast forward from the 1960s to the 148<sup>th</sup> day of 2018. Monday, May 28 at 12:59 p.m., seven vehicles are involved in a serious motor vehicle crash at milepost 91 on the Ohio Turnpike where six patients are suffering injuries, a husband and wife lost limbs from being run over by commercial vehicles, and three fire department first responders are transported to a hospital for heat exhaustion (“Gruesome Series of Crashes Leaves Couple Maimed,” 2018). This is a true call that appears very tragic; however, imagine the impact and patient outcomes if this motor vehicle crash happened in the 1960s or 1970s. The use of cell phones enhanced the response of EMS, and advanced life support treatment provided by paramedics helped save these lives.

The 1960s and early-1970s are among the most remarkable in American history (Schukov, 2019); however, they also mark a period when accidents contributed to a high number of fatalities and disabilities in America (“Accident Death and Disability: The Neglected Disease of Modern Society,” 1997). In the late 1960s, America was at war in Vietnam (Belotto, 2017; Hershberg, 2019), the new Boeing 747 wide-body jumbo jet became the world’s biggest aircraft (Bednarek, 2018; Smith, 2018), and Dwight D. Eisenhower’s National Highway System was underway (Lacy, 2018). As the interstate system opened, people were driving faster and traveling further which contributed to an increase in motor vehicle crashes, more traffic-related injuries, and an increase in fatalities (Belotto, 2017).

One reason for the high fatality rate is that consumer automobiles failed to protect occupants during a crash (Mohan & O’Neil, 2020). Most vehicles during the 1950s and 1960s did not come with seatbelts because Americans “believed that it was safer to be launched from the vehicle in an accident” (Holley, 2019). This theory is proven to be wrong (Holley, 2019).

According to the National Highway Traffic Safety Administration (NHTSA), seatbelt compliance reduces mortality and morbidity by more than 50% (Kent, 2003). Although the lack of vehicle seatbelts, or vehicle occupant non-compliance, contributed to high traffic fatalities in the 1960s and 1970s, high death rates were also contributed to the nonexistence of paramedics who could have otherwise rendered pre-hospital emergency care to those individuals who needlessly suffered and died while traveling America's highways (Belotto, 2017). MEDEVAC had been in existence for more than a decade in Korea and Southeast Asia to reduce transport times of wounded American soldiers to MASH facilities; however, there was no civilian MEDEVAC to rapidly transport critical patients to appropriate medical facilities or trauma centers in the United States (Maddry et al., 2018).

"Trauma is like any disease except that instead of a bacteria or a virus, the causative agent is energy" (Varghese, 2020). In 1965 alone, there were 49,000 Americans who died from injuries sustained during motor vehicle crashes ("Accident Death and Disability: The Neglected Disease of Modern Society," 1997). Many of these deaths could have been prevented if paramedics and resources, such as HEMS, had been in place. The role of the civilian paramedic came into existence when the U.S. Government recognized the problem of injury-related deaths, identified the need for pre-hospital emergency care, and proposed a solution to treat trauma patients at the scene of accidents and to continue the life-saving skills during patient transport to hospital emergency departments (Belotto, 2017). In 1966, a 37-page document, "Accidental Death and Disability: The Neglected Disease of Modern Society," later known as the white paper, was introduced by the National Academy of Sciences—National Research Council Committees on Trauma and Shock to develop paramedics whose role was to function as

physician extenders who were trained to render advanced prehospital care; thus, reducing trauma-related morbidity and mortality rates (“Accidental Death and Disability,” 1997).

Traffic fatalities and death from other accidental traumas were considered high by U.S. Government standards in the 1960s; however, death from trauma did not compare to the number of heart attack-related deaths. During the period when the white paper was being written, Dr. Walter Graf, a Los Angeles cardiologist, was working on a project to expand advanced cardiac life support outside hospitals. Dr. Graf was mortified by the number of individuals who were dying from acute myocardial infarctions, or heart attacks, before reaching definitive care in hospitals (“Doctor Helped Launch Modern Paramedic System,” 2015). In the 1960s, patients who were suffering from cardiac-related chest pains were only treated with sympathy and sirens (Chawkins, 2015).

In 1968 alone, the year Boeing released the 747, as identified by Bednarek (2018), there were 1,092,829 deaths contributed to heart disease and heart attacks (“Deaths by Major Causes,” n.d.; “Population Pyramids of the World from 1950 to 2100,” n.d.). To put this in perspective, the number of people who died from heart attacks during the 1960s and 1970s would fill seven Boeing 747s every single day per year, or 2,555 of these jumbo jets every year. In 1969, Dr. Walter Graf further inspired the framework for the paramedic profession when he converted a white Chevrolet van into a mobile critical care vehicle and he later placed cardiac defibrillators on ambulances to reduce the high numbers of cardiac-related deaths (“Doctor Helped Launch Modern Paramedic System,” 2015). The number of Americans who died from heart disease and heart attacks was 2,000 times greater than those who were killed in motor vehicle crashes; however, many Americans in the 1960s considered deaths from heart attacks to be natural causes rather than tragic and unexpected deaths from unforeseen traumatic events (Laurence et al.,

2017). Since the 1970s, paramedic training has improved (Corman, 2017) and the need for paramedics has since increased (Belotto, 2017).

### ***EMS in the Future***

Steve Jobs, founder, and chief executive officer of Apple once said, “people cannot connect dots looking forward, they must connect dots looking backward and trust they will connect in the future” (“Zacks Investment Research,” 2015). According to “EMS Agenda 2050” (2019), it is difficult to predict the future of EMS; therefore, it is best to create the future for EMS. Health forecasting to predict the increasing need for more ambulances and paramedics is determined by previous trends and the time series of emergency calls (Villani et al., 2017). To best serve patients in the future, EMS agencies must develop a relationship with public health professionals to efficiently serve the needs of patients (“EMS Agenda 2050,” 2019), decrease healthcare costs, and reduce hospital readmissions (Panagiotou et al., 2019).

In 1996, 30 years after the government’s released the white paper, the EMS Agenda for the Future was introduced to identify future needs and predictions for EMS (“EMS Agenda 2050,” 2019). The original document was written with the future in mind; however, engineers are advancing technology beyond what the original authors ever imagined. In 2014, the white paper was recommended to be amended by the National EMS Advisory Council and the final document was released in 2019 (“EMS Agenda 2050,” 2019). Since the document was amended, technical engineers are developing more ways to help EMS reach patients faster.

### ***A Transition from Current to Future Developments in EMS***

Researchers and engineers have developed the means for Apple’s Siri and Amazon’s Alexa to recognize individuals who are suffering from agonal respirations, an early sign of cardiac arrest, and notify 911 telecommunicators of the problem and the patients’ location (“3

Ways Automation will Impact EMS in the Near Future,” 2019). Patients who are suffering from this inefficient and irregular respiratory pattern, or respiratory compromise from any cause, will often not have the ability to call 911 to initiate an EMS response (“3 Ways Automation will Impact EMS in the Near Future,” 2019); thus, their condition will quickly deteriorate into a full cardiac arrest and death (Schleien & Craven, 2017).

Sudden cardiac arrest, an abrupt condition of heart-stopping, is almost always fatal without immediate lifesaving interventions (American Heart Association, 2020) including early bystander CPR and immediate defibrillation when applicable (Panchal et al., 2019). Cardiac arrest is a huge contributor to mortality and morbidity worldwide (Patel et al., 2016; Sinha et al., 2016). Despite bystander and fire department first responder CPR, “rates of return of spontaneous circulation (ROSC) and survival with minimal neurologic impairment remain low” (Patel et al., 2016, p. 359). Sinha et al. (2016) suggested that one reason cardiac arrest continues to be a problem in America is a lack of randomized controlled trials. Improving cardiac arrest survival rates and minimizing neurological deficits following ROSC will require “cardiac output monitors” (Mohindra et al., 2019, p. 230) to quantify CPR proficiency. According to Mohindra et al. (2019), the goal of CPR is to restore tissue perfusions to the heart, major organs, and the brain. Although ROSC is achieved in a small percentage of cardiac arrest patients, some of the patients suffer rearrests, neurological deficits, or poor outcomes such as low survival rates (Patel et al., 2016).

In the United States every year, out-of-hospital cardiac arrest affects more than 350,000 people, in which only 12% survive (American Heart Association, 2020; Leary et al., 2019). For every 10 patients who suffer out-of-hospital cardiac arrests in Canada, only one survives (Davis et al., 2018). Although cardiac arrest survival rates have somewhat increased over the past

decade (Daya et al., 2015), ROSC without neurological deficits and survival rates in the U.S. remain low (Becker et al., 2015; Neumar et al., 2015).

One example of the importance of public education is best described by the American Heart Association (2020) Chain of Survival concept on the importance of early recognition of patients experiencing myocardial infarctions before they suffer a cardiac arrest. “Lack of knowledge of acute myocardial infarction symptoms and coronary artery disease risk factors are associated with delayed treatments and significant comorbidities” (Banharak et al., 2018, p. 18). Patient survival is dependent on time-sensitive and effective cardiac resuscitation which consists of early CPR and rapid defibrillation (Panchal et al., 2019). Tuttle and Hubble (2018) found that ROSC, or patient survival rates, from “out of hospital cardiac arrest” are heavily dependent on the quality of bystander CPR, early defibrillation, post-resuscitative care, and the timing and quality of paramedic advanced life support interventions. Coronary heart disease contributes to over half of the sudden cardiac arrest deaths in the United States every year with an estimated 326,200 of these cases being out-of-hospital patients who are treated by EMS (Mozaffarian et al., 2015). Heart disease, cancer of all origins, and sudden unexpected death are the three leading causes of death among individuals 45 years of age and older (Mirzaei et al., 2019).

To reduce mortality and morbidity from heart disease, EMS must focus on education, skill proficiency, and stress reduction. In 2004, the National Highway Traffic Safety Administration (NHTSA) introduced a project titled “EMS Workforce Planning and Development” identifying a future for the industry to be adequately staffed with well educated, proficient, and healthy clinicians who are safe, valued, and properly compensated (National Association of State EMS Officials, 2020). Specialized new equipment and advanced technology in the out-of-hospital patient care environment are proposed for EMS in the future (Belotto,

2017). Artificial intelligence and body scanners to identify life-threatening injuries are products that are expected to be common in EMS (EMS Agenda 2050," 2019). Reducing the amount of time to reach patients, providing top-quality advanced-level care, transporting patients to the appropriate medical facility in the safest and most efficient means possible, adopting cultures of safety for paramedics to reduce workplace injuries which reduces the workforce, implementing programs in communities to educate people how to recognize early warning signs of acute and critical medical conditions, and develop projects to prevent injuries and illnesses are among the goals for EMS in the future ("EMS Agenda 2050," 2019). The future of EMS must include community awareness and education on the American Heart Association's "Chain of Survival concept" (Lambiase, 2017).

To save valuable time from the onset of an emergency until care arrives, it is predicted that U.S. EMS agencies in the future will be deploying unmanned aerial vehicles (DRONES) to deliver AEDs and medications, such as epinephrine, to "registered community medical volunteers" (p. 5) who are notified of nearby emergencies ("EMS Agenda 2050," 2019). One example of patients who depend on time-sensitive first responses is those suffering from myocardial infarctions (Lerche, 2016). Rapid EMS activation for someone who is potentially suffering from a myocardial infarction "is the most appropriate decision to survive this critical situation" (Banharak et al., 2018, p. 18).

To reach patients faster, DRONES are already being flown to deliver automatic external defibrillators to cardiac arrest patients in Sweden (Claesson et al., 2016). For every passing minute that a person is in ventricular fibrillation cardiac arrest, their chance of survival is reduced by 10% (Lerche, 2016). Early layperson cardiopulmonary resuscitation (CPR) and defibrillation triple patient survival rates (Davis et al., 2018). It is predicted that DRONES in the

future will be used to fly medications and medical supplies to patients and hospitals in disaster areas (Srivastava et al., 2018). Additionally, DRONES will be used to gather video footage and still images of accident scenes ("EMS Agenda 2050," 2019).

The potential for morbidity and mortality increases because of the lack of resource availability such as ambulances that are used to transport patients who complain of chronic non-life-threatening conditions (Moskatel & Slusky, 2019; Simpson et al., 2017). In the future, some EMS agencies are in the planning phase to contract "UberX" to transport non-critical patients to appropriate medical facilities, thus freeing ambulances to respond to emergency calls (Moskatel & Slusky, 2019). Additionally, professional development and continuous in-service medical training, or continuing education programs, using new and advanced technology are important components of lifelong learning for EMS workers to meet the needs of the people and to improve prehospital care ("EMS Agenda 2050," 2019; Hernandez et al., 2019). According to Hernandez et al. (2019), medical simulation is one of the most effective educational tools to train paramedics to effectively and properly manage any chronic medical condition, acute illness, or injury that EMS workers will encounter during their careers. According to "EMS Agenda 2050" (2019), initial education and ongoing training using advanced technology, like medical simulation, is critical to fill the gaps between previous education, future growth, promote paramedic retention, and assure paramedics remain competent to manage any illness or injury.

An additional structure, and recent development component of EMS and public health, is for EMS to satisfy patient and hospital needs in the future in the community paramedic program (Shah et al., 2018). Community paramedicine is a non-EMS paramedic-based "hospital-to-home Care Transitions Intervention (CTI)" (p. 2213) program recently implemented in many areas of the United States to reduce hospital readmissions during the first 30-days post-hospital discharge

(Shah et al., 2018) as a result of the “Patient Protection and Affordable Care Act (ACA)” (Gai & Pachamanova, 2019). Community paramedics are trained to perform in-home medical examinations and treat patients via “telemedicine physician guidance” (Abrashkin et al., 2016, p. 1) to help reduce hospital readmissions.

Hospital readmissions drastically reduce hospitals’ availability of resources and result in an annual Medicare cost of \$26 billion (Hines et al., 2014). In an attempt to reduce hospital readmissions, decrease healthcare costs, improve patient outcomes, and increase patient safety, “The Hospital Readmissions Reduction Program” (HRRP) was established by the “2010 Patient Protection and Affordable Care Act” (ACA; Gai & Pachamanova, 2019). HRRP places strong penalties on hospitals for patients who are readmitted for the same medical condition within 30 days of discharge (Panagiotou et al., 2019). Although community paramedicine provides efficient CTI, which reduces hospital readmissions and lowers healthcare costs, the programs can improve by expanding operations to include “emergency department-to-home transition” (Shah et al., 2018, p. 2213).

New community paramedicine models are needed to help improve the quality of life, healthcare, and the cost of healthcare for elderly patients who suffer from chronic illnesses (Abrashkin et al., 2016), especially those who are treated and discharged from hospital emergency departments (Mi et al., 2018). Mi et al. (2018) found that 20% of the elderly patients discharged from hospital emergency departments are readmitted to the emergency department within 30 days for the same conditions. Elderly patients often leave an emergency department without clearly understanding their discharge instructions, follow-up instructions with personal care providers, medication dosage instructions, and warning signs pertinent to their illness or condition that would necessitate further attention such as calling EMS or contacting their

personal-care physician (Mi et al., 2018). Community paramedics visit patients who have been recently discharged from the hospital, for certain illnesses, in their homes to assure they understand how to care for their conditions (Shah et al., 2018). This model will greatly benefit EMS by reducing frequent ambulance calls and hospital readmissions in the future (Shah et al., 2018). Because of a rapid increase in the population who suffer from chronic conditions requiring the services of paramedics, future EMS goals must address the predicted EMS shortages to meet future EMS demands (Doi et al., 2017) and develop more community paramedic programs to improve patient outcomes through CTIs (Shah et al., 2018).

Paramedics in the future are predicted to hold college degrees as a requirement, rather than an option, to deliver patient care ("EMS Agenda 2050," 2019). Additionally, it is predicted that ambulances will be equipped with response-assisted technology rather than lights and sirens for timely responses to the scenes of emergencies ("EMS Agenda 2050," 2019). Fatigue evaluation software after each ambulance call, automated medication dosing systems, and fair wages for paramedics is proposed to eliminate overtime, thus preventing paramedic injury and patient errors ("EMS Agenda 2050," 2019). For EMS to be efficient in reducing mortality and morbidity in the future, system administrators must identify goals focusing on people with an emphasis on the importance of EMS education and promoting quality healthcare in emergent and non-emergent situations ("EMS Agenda 2050," 2019).

### **Paramedic Stressors and Job Burnout**

Through the literature review's discovered themes, several challenges that influence paramedic retention in EMS, and several factors that impact EMS paramedic attrition, are revealed. Paramedic occupational burnout is "high compared with that found in other health professions" (Stein & Sibanda, 2016, p. 193). Occupational burnout is a condition of

accumulative stress from a variant of conditions, or stressors, often beyond an individual's control (Boland et al., 2019; Sridhar, 2018; Tärnqvist et al., 2017). "Stressor is a stimulus that causes stress, including physical, chemical, biological, social, psychological, cultural and other types" (Wu et al., 2020, p. 4). There is a strong correlation that exists between occupational stress, compassion fatigue, and occupational burnout in the paramedicine industry (Jaracz et al., 2017). Compassion fatigue is experienced by healthcare providers from conditions of traumatized individuals (Cocker & Joss, 2016). Compassion fatigue is emotional, spiritual, and physical depletion during the treatment of patients who are suffering from physical and emotional distress (Hassan, 2015).

Conversely, burnout is "more insidious in onset and is characterized by feelings of depersonalization (cynicism), loss of enthusiasm for work (emotional exhaustion), and a low sense of self-worth (personal accomplishment)" (Hassan, 2015, p. 586). Burnout is a condition of job-related exhaustion from chronic fatigue from job overload (Cheng et al., 2018). Fatigue decreases paramedics' situation awareness, negatively impacts their safety and health, and increases their risk for accidents during emergency operations (Corman, 2018). The empathy and compassion displayed by paramedics are mentally, physically, and financially costly to affected individuals and their families (Cocker & Joss, 2016); thus, contributing to burnout which increases attrition (Granter et al., 2019).

### ***EMS Stressors that Contribute to Paramedic Burnout***

Awareness of PTSD, effects of occupational stress, and contributing factors of burnout among paramedics have been acknowledged only in the past few years by EMS staff, administrators, and researchers (Davis et al., 2018). In 2020, the National Association of State EMS Officials developed a partnership with a team of scientists from the University of

Pittsburgh School of Medicine to mitigate fatigue in the industry by making recommendations based on comprehensive evaluations from evidence-based studies on the effects of fatigue (National Association of State EMS Officials, 2020). Repeated exposures to patients suffering from severe trauma take a mental and physical toll on the physical and psychological well-being of paramedics and can often lead to PTSD (Straud et al., 2018). Although it is common for some paramedics to suffer symptoms of stress and PTSD immediately following a traumatic event, others can cope with their experiences and recover without synchronicity (Straud et al., 2018).

**Table 2**

*Personal and Environmental Factors that Can Help Paramedics Manage Job-Related Stress*

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Personal and Environmental Factors in Managing Job Stress

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1. Optimism
2. Resilience
3. Sociodemographic status
4. Physical health
5. Motivational factors
6. Temperament
7. Life experience
8. Living situations
9. Social support
10. Community characteristics
11. Financial resources
12. Social systems

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*Note.* Jurišová (2016) identifies 12 factors that help combat work-related stress.

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Ogińska-Bulik and Kobylarczyk (2015) found that 72% of paramedics suffered psychological injuries or ill effects from traumatic patient experiences only once while 64% of the paramedics experienced the ramifications of their traumatic experiences at least twice. Psychologists and psychiatrists are specializing in treating paramedics suffering ill effects from occupational stress and PTSD (Davis et al., 2018). While it is difficult to gauge the amount of stress one can effectively manage, very little work has been focused on the issues, and no tools have been developed to capture the transitional stressors contributed by the industry (Davis et al., 2018). Additionally, a lack of emphasis is placed on organizational or administrative factors contributing to accumulative stressful conditions and associated health issues (Harrison, 2019) that lead to paramedic burnout.

Gramlich and Neer (2018) found that counseling and treatment for paramedics suffering from PTSD are available in most areas of the United States; however, no studies are reporting “exposure therapy” (p. 150) from psychological problems of frequent horrific images that are beyond the routine trauma calls those paramedics often encounter. These images embedded in the memories of most paramedics include “strongly aversive intrusive thoughts such as images of dismembered bodies or disgusting scenes” (Gramlich & Neer, 2018, p. 150). In the industry, paramedics are at high risk of developing PTSD (Jasielska & Ziarko, 2019) from frequent exposure to stressful and dangerous situations (Straud et al., 2018). In addition to being physically and emotionally involved with traumatic experiences from situations such as major

motor vehicle crashes or death from natural causes, homicides, and suicides, PTSD is contributed to indirect exposures such as daily job responsibilities or stress from administration (Gramlich & Neer, 2018). Organizational and operational factors like a lack of administrative support, low job autonomy, and poor leadership are negatively impacting the well-being and health of paramedics (Harrison, 2019), thus leading to occupational burnout and higher attrition in the industry.

Stressors include high call volumes during long shifts without ample time for rest and recovery (Boland et al., 2019; Sridhar, 2018). Paramedics are often caring for injured and sick individuals, drive ambulances in heavy traffic and conditions of low visibility, document the conditions and treatment rendered during calls, and are required to manage difficult situations (Janka & Duschek, 2018). Ambulances are a necessity; however, their response is sometimes unnecessary which results in unnecessary costs to insurance companies and patients (Moskatel & Slusky, 2019). While the delivery of rapid responses and timely treatment for patients experiencing critical illnesses and injuries remains to be fundamentals in the industry, paramedics are too often responding to non-urgent, or “ridiculous” calls that do not require their attention or even warrant an ambulance response (Simpson et al., 2017). Woodhouse (2017) described ridiculous ambulance calls to which paramedics have been known to respond including stomach pain, toenails needing cutting, people who are consistently passing gas, hiccups, and burping.

The care rendered by paramedics is vital in the chain of survival for patients suffering from true time-sensitive medical conditions or traumatic injuries; however, busy shifts hasten paramedic burnout (Boland et al., 2019), unnecessary or ridiculous ambulance calls decrease morale (Dejean et al., 2016; Woodhouse, 2017), and consistently waking up in the middle of the night, during 24-hour shifts, increases fatigue and stress while decreasing alertness and

situational awareness (Patterson et al., 2019). Additionally, violence toward EMS paramedics is a growing concern in the United States (Maguire et al., 2018) which increases the risk of injuries in the industry and contributes to attrition. Paramedics working long hours, such as 24-hour shifts, lose their sense of situation awareness and are at high risk for injuries which forces them out of the industry (Backberg, 2019; Patterson et al., 2019).

Backberg (2019) found that most EMS agencies in the United States average 10-20 calls per ambulance during a routine shift. Paramedics working 12-hour shifts routinely respond to an average of 10 calls per shift while those operating 24-hour shifts often respond to an average of 20 calls per shift (Backberg, 2019). Each ambulance call can take anywhere between one to three hours to clear from the time of dispatch until the stretcher is back in the ambulance, which drastically increases EMS paramedics' duty times when working high volume ambulances or busy shifts (Backberg, 2019). Ambulance call abuse, or "inappropriate use has serious repercussions" (p. 68) such as ambulances being unavailable to respond to "true emergencies" or other conditions such as the ability to clear an emergency department which contributes to longer response times (Dejean et al., 2016; Tärnqvist et al., 2017), negatively affects patient care (Boland et al., 2019), and increases paramedic burnout (Tärnqvist et al., 2017).

Emergency traffic during ambulance operations contributes to higher stress levels (Corman, 2018) and places paramedics at higher risk for ambulance crashes and injuries during low-visibility conditions such as nighttime operations, in dense fog, or during inclement weather (Janka & Duschek, 2018). During a 2016 national EMS response study, Watanabe et al. (2019) found there is a significant increase in ambulance crashes when running lights and sirens. Most vehicle crashes result in critical injuries and fatalities among the EMS staff during emergency operations (Watanabe et al., 2019). EMS paramedics are at greater risk to suffer work-related

injuries in comparison to the general workforce and they are three times more likely to suffer lost-time accidents than private-sector employees (Fass, 2018). Vehicle fatalities rates for EMS workers are averaging 4.8 times higher than fatalities in personal owned vehicle crashes (Fluxman, 2019). An estimated 6,500 ambulance crashes happen every year in the United States with 35% of these crashes resulting in fatalities or injuries of at least one EMS worker (Fluxman, 2019). Although there is an inherent risk for injuries and death in the industry, especially during emergency responses and during patient transport to hospitals, times saved are marginal and there is no difference in patient outcomes (Watanabe et al., 2019).

A 2018 report by a group of lawyers revealed that accidents involving ambulances are a critical and growing problem in the United States (Fluxman, 2019). Fatigue, mental exhaustion, and sleep deprivation drastically reduce EMS workers' reaction times, critical thinking, awareness, and abilities to make conscious decisions are impaired (Backberg, 2019; Patterson et al., 2019). Irregular and disruptive sleep patterns increase psychological and physiological stress, negatively affect critical thinking, and impair physiological abilities (Harbeck et al., 2015). While extended shift schedules, sleep deprivation, workplace fatigue, and team-mate unfamiliarity are common practices in EMS, these conditions unjustly contribute to increasing injuries in the industry (Weaver et al., 2015). Nocturnal work during 24-hour shifts of on-call structures disrupts sleep-wake cycles and "has been shown to affect cardiovascular homeostasis and to impair performance in neurocognitive and simulated clinical tasks" (Harbeck et al., 2015, p. 438). Conversely, ambulance operations require critical thinking, good judgment, alertness, situational awareness, skills, and fast decision-making abilities of both crewmembers when responding to emergencies (Corman, 2018).

***How Burnout Increases Paramedic Attrition***

“Work is an institution that rises to the level of a basic need” (Arenofsky, 2017, p. 5). An individual’s chosen profession must fulfill his basic needs, as defined by Abraham Maslow’s Hierarchy of Needs or risk losing the employee (D’Souza & Gurin, 2017). To avoid attrition, EMS directors and administrators must develop workforce structures that not only meet the employees’ needs but must also focus on reducing stressors in the workplace (Granter et al., 2019) and promote a well-defined work-life balance for their management team and staffing alike (Wilkinson et al., 2018). During the most recent decade, work-life balance has drawn much attention in organizations and a vast array of businesses across the United States (Kelliher et al., 2019). Low wages, long hours, stressful working conditions, and lack of administrative support contribute to occupational stress, job dissatisfaction, occupational burnout, and attrition among EMS paramedics (Osby, 2019). Occupational burnout happens when an individual develops feelings of mental, emotional, and physical exhaustion from stressors, overwhelming conditions, and uncontrollable job environments surrounding his work (Schilling et al., 2018). These conditions, or stressors, produce stress that introduces attrition ideation in the industry rather than conditions fostering the basic needs of the workforce. It is evident from the literature throughout this study that EMS paramedics suffer from a tremendous number of stressors that consistently exceed their capabilities such as overwhelming job conditions, uncontrollable environments, demanding schedules, long work hours, mandatory overtime, and lack of administrative support. Occupation burnout often occurs when one’s job demand exceeds his capabilities (Cheng et al., 2018). Individuals who experience occupational burnout have a high risk for additional uncontrollable stress, they devalue the importance of a quality work-life

balance, and most end up leaving their employer or the occupation entirely (Schilling et al., 2018).

The concept, of “work-life balance,” was introduced in industries shortly after the end of World War II when women, who mostly remained in their homes to care for their families and children, sought gainful employment (Roberts, 2007). In the 1970s, work-life balance expanded to attract more female labor by creating job environments in which more working mothers could assume dual roles of maintaining their parental responsibilities and managing work commitments (Gatrell et al., 2013). Mothers across America assumed the dual roles of childcare while earning a living to help support their families (Rapoport & Rapoport, 1977). By the 1980s, several American companies restructured their work-life balance to include dual-gender benefits which included “maternity leave, flexible scheduling, telecommuting, and employee assistance” (Arenofsky, 2017, p. 4). In more recent years, Wilkinson et al. (2018) argued that many organizations throughout America are not meeting the needs of employees by failing to implement attractive or flexible schedules, autonomous work structures, and a well-defined work-life balanced program to meet the needs of their workgroups, or the majority of their staffing at a minimum.

### **Paramedic Shortages**

Paramedics are often first on the scene of medical and trauma emergencies to care for individuals experiencing “the worst day of their lives” (Hadas, 2019, p. ii). Their role includes a wide scope of medical protocols to treat patients suffering from a broad spectrum of illnesses and injuries ranging from patients suffering minor ailments to those requiring immediate care because of life-threatening illnesses or injuries in diverse environments, often with extreme constraints of time and resources (McManamny et al., 2020). The routine exposures to traumatic

events and a variety of medical calls in uncontrolled environments often contribute to stress-related psychological disorders, severe depression, and medical illnesses in the industry which increases paramedic attrition (Wild et al., 2016).

In addition to the accumulative stress from treating patients suffering from life-threatening illnesses and injuries (Boland et al., 2019), paramedics encounter stressors from routine shiftwork, uncertain emergency calls, and transitioning from periods of rest to rapid responses (Janka & Duschek, 2017). Additionally, staffing shortages from attrition, suicide, psychological disorders, and PTSD are causing great concerns worldwide (Asbury et al., 2017). Paramedics are dedicated pre-hospital clinicians who are frequently dealing with death, destruction, and burned bodies to the point that most of the workforce experience psychological issues for the remainder of their lives (Ludwig, 2015). More than half of EMS paramedics have symptoms of PTSD which is an early prognosis for full-blown PTSD (Jasielska & Ziarko, 2019). Uncontrollable stress and PTSD among paramedics lead to attrition, a decline in the quality of patient care, and EMS paramedic staffing deficits (Boland et al., 2019; Miller et al., 2018).

### ***Why Paramedics Leave EMS***

According to 10 years of the Longitudinal EMT Attributes and Demographics Study (LEADS) between 1999 and 2008, most paramedics were found to be dissatisfied with pay, advancement opportunities, and benefits (Chapman et al., 2016). The study revealed that six percent of the paramedics surveyed planned to leave the profession within 12-months (Chapman et al., 2016). The LEADS research project was introduced by the National Registry of Emergency Medical Technicians (NREMT) to study EMS employee satisfaction (Levine, 2016). In addition to the problems identified during NREMT's 10-year LEADS, Boland et al. (2019) found that paramedics encounter tremendous occupational stress which contributes to burnout

and attrition. “Traumatic calls, poor sleep quality, long shifts, lack of downtime after difficult calls, low salary, and low job satisfaction combine to make EMS one of the toughest jobs around” (Lulla et al., 2020, p. 46).

Blau et al. (2016) found that most paramedics who were once satisfied with their occupation chose to leave for further educational opportunities, relocating to a new area, and the desire for better pay and benefits. Although there are paramedics in the industry who are satisfied with their jobs, employee retention remains an issue for most agencies (Blau et al., 2016). While some paramedics are satisfied or at least content in their jobs, the average career lifespan of most EMS paramedics is only 5 years or less (Backberg, 2019; Dropkin et al., 2019).

The industry suffers from paramedics who voluntarily terminate their jobs and from those who are forced out because of injuries, illnesses, medical problems, or infectious diseases. Paramedics are at high risk of contracting a variety of diseases from infectious patients (Garus-Pakowska et al., 2017; Thomas et al., 2017). EMS paramedics are at great risk of harm from frequent exposures to blood (Alhazmi et al., 2018), body fluids, infectious diseases (Thomas et al., 2017), infectious materials such as used intravenous cannulation needles (Garus-Pakowska et al., 2017), blood products, and syringes (Seida et al., 2018), which also contribute to the attrition rates. In a recent study on paramedic exposures to infectious materials, Garus-Pakowska et al. (2017) found that 78% of paramedics reported being exposed to infectious substances and materials several times per week and 41.4% of the paramedics reported the high-risk exposures about 12 times per day. These highly skilled pre-hospital clinicians respond to emergency calls of uncontrolled scenes, often without any knowledge of the potential risk that may be lurking, thus making “paramedicine one of the most dangerous occupations” (Thomas et al., 2017, p. 217).

In 2020, the increase in ambulance calls to treat patients who are potentially sick with SARS-CoV-2, better known as coronavirus and COVID-19, is taking a toll on the mental and physical well-being of paramedics (Johnson, 2020). COVID-19 is seriously impacting medical staff, especially those who are working the front lines such as first responders and paramedics (Wu et al., 2020). While most of America sheltered in their homes to avoid the deadly pandemic, paramedics responded to everything, including the simplest medical calls, major trauma, and now the highly contagious coronavirus (Cha, 2020). As of April 16, 2020, the Center for Disease Control (CDC) statistics shows that approximately 632,548 individuals in the United States have been infected with COVID-19 and 31,071 have died from the highly contagious pandemic (Ventura et al., 2020).

The highly contagious and deadly coronavirus originated in China in late 2019 and quickly spread around the world like a pandemic during the first several months of 2020 (Angioni, 2020). Hospital admissions from COVID-19 are extremely high and will be even higher as the pandemic infects more people across the United States (“COVIDView: A Weekly Surveillance Summary of U.S. COVID-19 Activity,” 2020). In New York City alone, more than 1000 paramedics and firefighters have contracted COVID-19 (O'Donnell, 2020). Paramedics are encountering a great deal of pressure and added occupational stress as staffing shortages increase from more frequent callouts because of the increase in coronavirus-related illnesses and deaths (Johnson, 2020).

Additionally, EMS professionals are frequently exposed to dangerous and stressful working conditions from job-related hazards, violent patients, and challenging or uncontrolled environments (Bentley et al., 2016). The role of EMS paramedics requires a “physically demanding, time-sensitive task” (p. 34) which often places them at high risk for injury

(Armstrong et al., 2017). During the 10-year LEADS survey, 20% to 24% of the paramedics who participated in the study reported back injuries, 7% to 10% reported hearing problems, and 20% to 27% reported sleep problems (Bentley et al., 2016). The primary reason for the LEADS 2005 to 2015 study was to identify and better understand sleep problems in the industry; however, numerous safety concerns and injuries were revealed during this 10-year research project (Bentley et al., 2016).

Equipment, such as manual load stretchers, is identified as a leading contributor to injuries in the industry which often leads to paramedics having to leave the industry (Armstrong et al., 2017; Bentley et al., 2016). Armstrong et al. (2017) found that EMS agencies that implemented power-load stretchers had a reduction in musculoskeletal disorders by 43% and a reduction in stretcher-related musculoskeletal disorders by 78%. Fass (2019) found that the leading injury contributing to paramedics having to leave the industry is musculoskeletal injuries of the back from patient handling and moving. One in four paramedics suffers career-ending back injuries within the first 4 years of working in EMS (“CDC - Emergency Medical Service Workers – NIOSH Injury and Illness Data,” 2019). Maintaining the safety, health, and well-being of paramedics is of the utmost importance for these highly skilled clinicians to be available and ready to render emergency care to those who so desperately depend on their response (Bentley et al., 2016).

While infectious disease and injuries are included as reasons for attrition, Dropkin et al. (2019) found that most paramedics in the United States voluntarily terminated their positions because of the low pay and high stress. Blau et al. (2016) found that the low wages contribute to the high attrition rates of these highly skilled clinicians, while Jankowski (2015) blamed the turnover rate on the long hours and mandatory overtime. Some paramedics leave EMS because

of patient ambulance misuse; thus, leading to longer duty time hours with limited downtimes for rest or meals which drastically increases fatigue, creates higher stress levels, and contributes to job burnout (Tärnqvist et al., 2017).

Numerous articles in this review of literature strongly suggest that the cause of paramedic shortages is contributed to a lack of Herzberg's hygiene motivational factors and long hours. Pete Giegerich, who worked for Greenville County EMS in SC between 2009 and 2012, stated that long EMS duty times from extended work shifts lead to accumulative stress, extreme exhaustion, and inadequate recovery time before the next scheduled shift (as cited in Osby & Mitchell, 2019). "A normal work shift is generally considered to be a work period of no more than eight consecutive hours during the day, five days a week with at least an eight-hour rest" ("Occupational Safety and Health Administration," n.d., para. 1). EMS paramedics' shifts often exceed 12-hours (Osby & Mitchell, 2019); thus, increasing the risk for errors and paramedic burnout (Weaver et al., 2015). Paramedics who experience job burnout tend to avoid colleagues and other people in the industry, develop negative or uncaring attitudes toward patients, and are more susceptible to medical errors (Baier et al., 2018).

### ***Employee Motivator and Demotivator Factors***

There are intrinsic and extrinsic motivational factors, inherent to employee satisfaction, as defined by Herzberg's Two-Factor Theory of Motivation (Aliekperova, 2018). Additionally, people need appreciation and belonging through Maslow's original five psychological concepts, which D'Souza and Gurin (2017) described as the sense of belonging, love, safety, self-actualization, and esteem. One study, where 5,820 employees surveyed in different industries and professions throughout the U.S., U.K., and Austria, revealed that 69% of American workers become demotivated because of a lack of recognition, 43% are demotivated because they feel

invisible or undervalued, and 42% of America’s workforce are demotivated because of bad managers (“Reward Gateway Study Finds the Top 3 Demotivators,” 2018).

Employees are primarily motivated by appreciation and recognition by their managers. In the United States “A recent poll of over 1,000 full-time employees by Maritz Research found over half believed the quality of their company's recognition efforts impacted their job performance” (“Herzberg’s Two Factor Theory,” 2018).

**Figure 5**

*Contribute Factors of Employee Motivation, Satisfaction, and Happiness*



*Note.* Retrieved from <http://www.whatishumanresource.com/herzberg-two-factor-theory>.

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While some paramedics who suffer from PTSD or occupational burnout voluntarily terminate their position in EMS, others feel trapped and look for alternative solutions (Stanley et al., 2016). Most paramedics chose their occupation because of the intrinsic factor of achievement, work satisfaction, challenges, and job responsibilities (McNamara, 2016) under Herzberg's Two-Factor Theory of Motivation rather than extrinsic factors such as compensation, job security, work status, and working conditions (Herzberg, 1968). After these individuals enter the industry and encounter life experiences of low pay, poor benefits, and increasing living expenses, most lose sight of the reasons they became paramedics (McNamara, 2016) and eventually leave the industry. Although the intrinsic factors under Herzberg's Two-Factor Theory are motivators for paramedics to enter the occupation and remain valuable EMS assets for a few years, some paramedics are driven away from the industry because of the lack of Herzberg's extrinsic, or hygiene, factors such as pay and benefits (Peterson, 2019; Viperman, 2019). As mentioned previously, paramedics have one of the lowest-paid occupations in the United States (Bahler, 2018). Hourly pay for some paramedics in the United States is equivalent to wages for most McDonald's restaurant employees whose educational requirements and responsibilities are far from those required by paramedics (Ludwig, 2015).

According to Herzberg's Two-Factor Theory of Motivation, employees are not motivated by Herzberg's extrinsic, or hygiene, factors (e.g., pay, job security, work status, and working conditions; Herzberg, 1968); however, they are demotivated and seek alternative career paths in the absence of Herzberg's extrinsic factors (Peterson, 2019). After the 2008 economic downturn, most paramedics have received very low, if any, raises (Ludwig, 2015). Low pay in the industry contributes to drastic increases in paramedic openings (Snyder, 2019). Moonlighting, among different EMS agencies, is common among paramedics because of the number of openings in the

industry (Simpson, 2016); however, working in multiple agencies increases the risk for occupational burnout and attrition (Sridhar, 2018), thus leading to further shortages.

Suicide rates among paramedics contribute to significant losses. The combination of low wages and long hours increases stress levels, leads to job dissatisfaction (Osby, 2019), and heightens the risk for PTSD (Miller et al., 2018). The PTSD and stress created by the industry can trigger suicidal ideations (Wells, 2016). Suicides among paramedics are higher than those in any other occupation (Martin et al., 2017; Vigil et al., 2019). Furthermore, suicides account for the 10<sup>th</sup> leading cause of death in the United States (Vigil et al., 2019). Despite the number of suicides among first responders every year, “few studies have evaluated suicide among paramedics” (Stanley et al., 2016, p. 38). Willing (2016) found that 16 emergency first responders died from suicides in 2016 and 39 responders died from suicide in 2015. One reason for the suicides in the industry is that these individuals feel trapped in their occupation, and they feel isolated from their superiors (Weaver et al., 2015).

Paramedics often feel that they cannot discuss their problems, PTSD concerns, or suicide ideation with their superiors and colleagues, or seek help from professional counselors (Weaver et al., 2015). Because EMS administrators are not addressing the issues that contribute to occupational stress (Tärnqvist et al., 2017) most paramedics often feel that they cannot debrief their stress or suicidal ideations with supervisors or coworkers because they “fear being perceived as weaker than their peers or retaliation from supervisors” (Lulla et al., 2020, p. 46). While EMS employee “stress debriefing,” by non-professional peer counselors is available in most areas across the United States for paramedics who are experiencing psychological issues (Gramlich & Neer, 2018), there are only a few EMS agencies offering “professional counseling” services by licensed psychologists or psychiatrist to EMS clinicians (Patterson et al., 2015).

Although most paramedics are unaware of local resources to combat stress and PTSD, professional help is available at a national level. In 2014, “The Code Green Campaign” was founded as an educational and advocacy program to provide support and resources to first responders who are suffering from mental health problems (The Code Green Campaign, 2019).

As mentioned, factors that lead to the high attrition of EMS workers are a result in the injuries that many EMS employees suffer. Gray and Collie (2017) found that EMS workers have a higher percentage of injuries in comparison to employees in other professions. Paramedics who work longer shifts, such as 24-hour shift schedules, are at high risk for injuries (Lindberg, 2015) mostly because of an increase in fatigue and sleep deprivation during the ladder portion, or nighttime hours, which contributes to visual impairments (Patterson et al., 2019). To identify injury risk conditions in the industry, studies should evaluate the number of injuries per hour rather than the total injuries per shift (Lindberg, 2015).

In addition to negative experiences from long shifts, most paramedics working extended hours complain that they do not have adequate recovery time before their next shift (Boland et al., 2019; Sridhar, 2018). There is limited information about what other factors contribute to negative experiences among EMS employees; however, Miller et al. (2018) stated that there is limited research contributing to work factors that influence coping mechanisms among EMS workers.

A national study by the American Ambulance Association estimated that 1,284 SC EMS paramedics and 2,636 NC EMS paramedics resigned their positions in 2018. The U.S. Bureau of Labor (2019) May 2018 statistics estimated there were 5,240 EMS patient care provider jobs in SC and 10,760 EMS patient care provider jobs in NC. As previously identified, the average paramedic career lifespan of paramedics in the United States is 5 years (Backberg, 2019);

Dropkin et al., 2019). In summary, Dropkin et al. (2019) found that most paramedics have left the industry because of the pay or the stressful working conditions.

### ***The Importance of EMS Paramedic Retention***

While this review of the literature identifies specific characteristics of paramedic attrition and found to have a negative influence on the quality of patient care in the United States (Baier et al., 2018; Boland et al., 2019), the main purpose of this review of literature is to add to the body of knowledge from the study by expanding on the understanding of reasons for paramedic staffing shortages and its effects on patient care in SC and NC. The literature on the importance of paramedic retention will help identify to what extent paramedic tenure influences paramedic longevity and what interventions may have the most impact on recruiting newly certified paramedics in SC and NC. High employee turnover in most organizations is a challenging and time-consuming phenomenon (Staelens & Louche, 2017). Hiring and onboarding new paramedics are time-consuming and costly. Over 50% of the EMS agencies in SC report taking four months to hire employees; however, 34% report taking at least six months (Osby, 2019). Employee attrition creates substantial losses in organizations' operational and financial structures because of the operational disruptions along with social and human capital deficits (De Winne et al., 2019). "The most important asset of any business is its employees" (Vinerean, 2015, p. 73) and EMS is no exception. Healthcare clinicians, in both pre-hospital and in-hospital environments, are aware of the national paramedic shortage from attrition (McInulty, 2016). One potential recommendation, to eliminate worsening patient outcomes during out-of-hospital care and after the transitional phase of patient hospital admissions, is that EMS managers must eliminate paramedic shortages by drastically reducing paramedic attrition (Baier et al., 2018).

To preserve quality care in the pre-hospital environment, EMS must address staffing issues that will result in a positive impact on the overall performance of the EMS organization and will reduce mortality and morbidity. There is a negative linear correlation that exists between employee attrition and performance measures from customer satisfaction, product or service quality, organizational performance, and added value (De Winne et al., 2019). In EMS, organizational performance, added value, and customer service hinges on KPIs such as ambulance response times, quality patient care, and paramedic skill proficiency markers. Organizations experience numerous difficulties in managing KPIs or maintaining positive performance measures from high employee volatility (De Winne et al., 2019). A huge pitfall in the industry is prolonged on-scene times from lengthy trauma care interventions leading to worsening patient outcomes (Rouse et al., 2018) often contributed to inexperienced paramedics from the high turnover in the industry.

Paramedics are essential employees of EMS who are there during the early morning, the middle of the night, on weekends, on holidays, during tornadoes, flooding, and through all other disasters both natural and unnatural (Hadas, 2019). These highly trained clinicians are “edge workers” meaning that these individuals are attracted to the industry “because of its high-stakes, risky and fast-moving nature” (Granter et al., 2019, p. 283). Paramedics are the most advanced prehospital patient care providers whose role requires them to oversee emergency calls while providing basic and advanced levels of pre-hospital patient care (“National Registry of EMTs,” 2020). This review of the literature clearly shows that all EMS agencies and the general public have a huge need for more experienced and quality paramedics who are good at what they do, who display good judgment, and who practice quality care.

**Paramedic Shortage and its Effects on EMS Key Performance Indicators (KPIs)**

The literature on paramedic shortages and their effects on EMS KPIs will better determine to what extent paramedic experience, through tenure, influences EMS Key Performance Indicators. To fill openings and staff ambulances, EMS directors are settling to hire paramedics who have substandard skills or limited experience which contributes to an increase in medication errors, ambulance accidents, unsatisfactory patient care, under-or-over triage of patients, poor customer service, and prolonged ambulance response or patient transport times.

“In medical emergencies, a few minutes can be the difference between life and death”

(Srivastava et al., 2018, p. 1). Trauma patients requiring fast transport to a trauma center are one example where time for definitive care is critical (Newgard et al., 2016). Lack of care or improper care by paramedics can contribute to patient mortality. Under-triage of patients by paramedics can be fatal to the patient while over-triage of patients by paramedics is a waste of resources and cost (Newgard et al., 2016). Prehospital emergency care by paramedics is hazardous work and it has a high risk of causing harm to patients from treatment criteria such as poor assessment skills, prolonged ambulance response times, delayed scene times, and extended transport times (Yardley & Donaldson, 2016).

Inappropriate field triage, delayed responses, longer transport times, and improper destination decisions often delay “definitive care, potentially increasing morbidity, mortality, and resource utilization” (Hwang et al., 2019, p. 482). EMS employee attrition is linked to longer ambulance response times, improper or rushed training during new-hire onboarding, an increase in medical errors, and the lack of available resources and personnel. Paramedic attrition in EMS is linked to a decline in the quality of patient care because of contributing conditions and factors that cause employee burnout (Boland et al., 2019). Exhaustion from working long shifts

contributes to critical errors, failure to meet EMS performance measures, and safety concerns that often make a difference in patient outcomes. Pyper and Paterson (2016) found that fatigue contributes to drug administration errors and paramedics falling asleep while driving which is a huge hazard for patients, ambulance crews, motorists, and pedestrians.

While EMS has not been proactive to identify better structures to improve the leading cause of death, or myocardial infarctions, that severely impact the older population, some agencies have taken measures to promote the safety and well-being of children. In 1984, the U.S. Congress enacted legislation that established the EMS for children (EMSC) program residing in the “U.S. Department of Human Services” (Genovesi et al., 2018, p. 207). Every U.S. state’s EMS office is required to partner with the federal government’s EMSC program, the only source of ongoing federal funding, to implement safety programs, provide education to EMS agencies, and monitor performance measures at the state level in an attempt to reduce morbidity and mortality of children (Genovesi et al., 2018).

### ***How Paramedic Staffing Shortages Affect Patient Care***

Paramedic attrition is “negatively associated with job satisfaction” (p. 49), it negatively impacts EMS organizations, and it negatively affects other employees (Parray & Bhat, 2019). The physical, mental, and emotional components of EMS contribute to accumulative stress affecting paramedic retention (Blau et al., 2016; Osby & Mitchell, 2019). Although the work intensity in the industry increases the paramedics’ risk for illness and organizational deficiencies, paramedics are driven by the intense intrinsic factors of satisfaction, feelings of intensity, or being highly involved in saving an individual’s life (Granter et al., 2019).

EMS in the United States is not broken; however, it is fragmented by not being able to keep up with the current or growing pre-hospital healthcare needs (Cannuscio et al., 2016). As

EMS agencies encounter higher call volumes, EMS managers and administrators must focus on retaining paramedics while implementing strategies to attract new paramedics (Chapman et al., 2016). EMS agencies across the United States are relying on fire department first responders to initiate basic life support, or provide medical assistance, mostly because EMS is failing to meet the public's current demand promptly or keep up with future needs (Cannuscio et al., 2016).

Historically, EMS is a reactive organization rather than a proactive agency. Between 2005 and 2030, it is estimated that the number of patients requiring prehospital care will double (Chapman et al., 2016). In addition to the stressors of the job and the lack of extrinsic job satisfaction, such as the desire for better benefits and pay, many paramedics leave the profession because of health issues or are physically unable to do the job (Blau et al., 2016). Additionally, a lack of intrinsic job satisfaction contributes to many paramedics' intent of leaving the occupation (Blau et al., 2016).

### ***Factors that Increase Patient Morbidity and Mortality***

Stress and anxiety among paramedics are the second-highest contributors to medical errors in the pre-hospital environment (Guise et al., 2017). Human factors, such as anxiety, depression, or uncontrollable stress, from either personal or work factors, are leading contributors to medical errors (Hall et al., 2016). Medical errors are the third leading cause of death in the United States; however, it is not a clinical diagnosis listed on death certificates (Makary & Daniel, 2016). Numerous conditions and factors are contributing to medical errors in the out-of-hospital environment. Unfavorable working conditions and job burnout in EMS are linked to a staggering increase in medical fallacy which contributes to higher patient morbidity and mortality rates (Weaver et al., 2015). Hall et al. (2016) stated that paramedic stress and occupational burnout are proven to negatively affect patient safety. Stressors contributing to

paramedic burnout have always been accepted as normal occupational conditions within the industry (Granter et al., 2019). EMS front-line managers are responsible for timely ambulance responses and making sure they always have the staffing to provide quality patient care (Çapar et al., 2017). While most managers do not hesitate to address performance pitfalls such as extended ambulance responses or substandard patient care, most will not address the long shift hours, limited downtimes, compensation complaints, or the stressful working conditions that contribute to paramedic stress and burnout (Tärnqvist et al., 2017); thus, leading to longer response times and negative patient outcomes (Baier et al., 2018; Boland et al., 2019).

### ***EMS Organizational Performance Dilemmas***

Because there is always an urgent need for paramedics, EMS hiring managers are often forced to hire less qualified EMTs, in lout of paramedics, to fill openings and keep ambulances on the roads (Osby, 2019). One example is a “tiered EMS system” in Greenville County, SC where EMTs respond on basic life support ambulances for less critical calls while the advanced life support ambulances, staffed by a paramedic and EMT, are reserved for the more serious calls (Osby, 2019). To promote the safest ambulance operations, maintain a consistent balance of performance measures, and provide the patients with safe and efficient care, rookie paramedics should not be partnered together or with an EMT on an ambulance; however, many EMS agencies in the United States, including SC and NC, frequently place two newly certified clinicians on an ambulance just to fill the needs (Osby, 2019). Recently certified paramedics should be placed with experienced paramedics for the best opportunity of meeting EMS KPIs (McInulty, 2016).

Paramedics must be highly skilled pre-hospital patient care clinicians who must also display good decision-making abilities in highly complex environments; however, the decisions

made by paramedics are a multifaceted structure where events can have negative implications for patient safety and clinical outcomes (Reay et al., 2018). Just one example of poor judgment, bad decision-making, and the lack of critical thinking contributed by inexperienced providers, a lack of proper education, rushed training during onboarding, or poor management is described during a routine emergency call in 2009. On June 25, two rooky paramedics sat around the corner of James Hearst's apartment, with lights off and doing nothing for almost 30 minutes after responding to the area, while Mr. Hearst lay dying on his floor from a heart attack and fall (Gee, 2009). It is common for paramedics to stage near emergency call locations when scenes are unsafe for them to proceed; however, on this horrific night, there was nothing that should have alerted the two paramedics of a safety concern other than a vague report that Mr. Hearst may have consumed alcoholic beverages earlier (Gee, 2009).

Maintaining good paramedics who are experienced and who can display good judgment often makes the difference between life and death (Reay et al., 2018). Unfortunately, most EMS agencies in the Carolinas have problems staffing and retaining quality paramedics (Osby, 2019). EMS paramedics are well known around the world for their high levels of accumulative stress, emotional and physical exhaustion, psychological issues, work strain, and occupational burnout (Granter et al., 2019) which leads to high workforce attrition in the industry (Miller et al., 2018; Sridhar, 2018). Workforce attrition is financially costly, and it disrupts operations in numerous industries (Emadi & Staats, 2020). To retain paramedics, EMS administrators must develop a culture offering opportunities for career advancement (Blau et al., 2016). EMS managers who fail to promote positive work environments will have higher attrition and often have paramedics who fail to produce quality care. Employee behavior is influenced by organizational culture (Parray & Bhat, 2019).

### **Summary of the Review of Literature**

Despite the many problems contributing to paramedic shortages and the increasing need for paramedics by 2030 (Castro Lopes et al., 2017), EMS administrators are highly likely to proceed status-quo rather than developing strategies to combat these issues which contribute to the EMS staffing deficits of paramedics. Although the job contributes to high-stress levels leading to PTSD and occupational burnout, some paramedics overcome the occupational challenges by focusing on positive perspectives of the occupation. By the occupation, paramedics experience numerous bad days while at work; however, they also experience good days (Dick, 2016). To summarize, a demand for more ambulances (Christensen et al., 2017), the increasing patient population by the year 2030 (Castro Lopes et al., 2017), and the declining paramedic preservation will result in declining paramedic performance in addition to an increase in patient care errors. Because of the projected increase in patients, EMS administrators must explore goals to recruit and retain paramedics (Chapman et al., 2016) rather than accepting attrition as an industry standard.

## Section 2: The Project

The EMS system in the United States is experiencing a critical shortage of paramedics. This study is on paramedic attrition specific to South Carolina (SC) and North Carolina (NC). Numerous agencies in these states have reported significant problems retaining and recruiting paramedics (Osby, 2019), which negatively affects patient care (Baier et al., 2018). Because of high workforce attrition in the industry and the increasing demand for paramedics to meet the growing population of patients, recruitment and retention of these highly skilled pre-hospital patient care providers have become a critical problem (Belotto, 2017). Some EMS administrators across the United States have ignored issues contributing to attrition (Tärnqvist et al., 2017), including compensation and occupational stress, while others have failed to address the increasing staffing shortage. The industry is suffering a critical level of understaffing and under-preparedness (Belotto, 2017). If this trend persists, EMS agencies will continue to incur higher paramedic shortages (Belotto, 2017); thus, increasing patient suffering because EMS will not have adequate staffing to perform the expected basic and customary functions of pre-hospital patient care in a timely and efficient manner (Baier et al., 2018; Boland et al., 2019).

The purpose of this multi-case qualitative study was to explore paramedics' preconceived motivational expectations based on the models of Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs as identified by Abraham Maslow's Hierarchy of Needs. Additionally, this study has further explored reasons for job changes of paramedics such as voluntary termination, agency transfer, pursuing a different occupation, or other career change-related motives. In cases of misaligned preconceived notions of expectations or needs before entering the industry in comparison to subsequent experiences or perceptions, this study explored how the extent of job dissatisfaction contributes to attrition ideation. In cases where

preoccupation motivational factors and needs expectations were aligned with post-employment perceptions of experiences, job satisfaction factors were examined.

### **Purpose Statement**

The purpose of this qualitative case study was to add to the body of knowledge by expanding on the understanding of the reasons for paramedic staffing shortages in EMS. The reason overcoming paramedic staffing shortages is so important to the industry is the effects it has on patient care in the out-of-hospital setting. EMS paramedics are challenged with the ability to think critically, display good judgment, recall clinical knowledge, produce psycho-motor skills effectively during time-sensitive emergencies, and maintain reflexes during ambulance operations and scene management (Corman, 2019). During staffing shortages, paramedics often work extended shifts, and some are mandated to work overtime; thus, reducing these prehospital healthcare providers' situational awareness and their ability to think critically (Backberg, 2019).

This study is critical to SC and NC because the problem ultimately affects patient care in these areas that have been identified as having high medical needs. One example to illustrate the need for this study is the drastic number of patients who suffer from strokes. In the United States every year someone suffers a stroke every 40 seconds and someone dies from a stroke every four minutes. It is the leading cause of disability affecting 795,000 suffers, the fifth leading cause of death killing 140,000 people, and costs \$34 billion ("Stroke Facts," 2020). Since 1965, the Center for Disease Control has identified SC and NC as two of the eight states with the highest stroke mortality rates, also referred to as "the stroke belt" (Howard & Howard, 2020, p. 742).

Timely first response and rapid patient transport to a hospital with a stroke center are critical in reducing disability and death from stroke (Powers et al., 2018). To reduce mortality and morbidity in the Carolinas, EMS agencies must stop the outflow of paramedics. Based on the

researcher's peer conversations and professional networking, there are industry professionals and EMS educators who believe that some of the EMS paramedic attrition can be reduced by "introducing new and exciting career advancement opportunities" in EMS. Primarily, this study sought to identify reasons for EMS paramedic attrition and paramedic shortages in EMS, which contributes to prehospital patient morbidity and mortality, through personal interviews as the method for data collecting. Secondarily, the data obtained from the interviews was supported by archivable data solely for triangulation and statistical descriptive purposes to strengthen the validity and reliability of the study.

### **Role of the Researcher**

The role of the researcher in qualitative research is to facilitate the study, build a rapport with participants, and conduct personal interviews with participants to elicit details about their professional experiences (Johnson, 2017). I am an expert in emergency medical services (EMS), with over 35 years of experience in paramedicine and have worked for 19 South Carolina (SC) and North Carolina (NC) organizations; thus, a rapport with participants is easily obtainable. During the last three decades, from 1990 to 2020, I worked for at least two agencies simultaneously, except for two months in 1998 because of an agency lay-off. Concurrent EMS paramedic positions include two full-time jobs and two part-time jobs simultaneously from 1994 to 1997. Additionally, I held five consecutive jobs, from 2009 to 2011, with two of the five being full-time positions. Furthermore, my resume includes out-of-hospital specialized patient care positions, critical care ground transport, and critical care medical flight. Other vital positions in the industry consist of a variety of medical education opportunities including a vast array of prehospital and in-hospital education and medical simulation for physicians, registered nurses,

respiratory therapists, paramedics, emergency medical technicians, critical care paramedics, and flight paramedics just to name a few.

A career in emergency medical services (EMS) entails ambulance accidents, threats from patients, and physical conflicts with inebriated and combative patients. I encountered all the aforementioned scenarios in addition to suffering back injuries from lifting patients and painstakingly experiencing the suicide of three colleagues. Because of the stressful working conditions, having to deal with years of death and trauma, long hours, multiple jobs, physical abuse from patients, low pay, accumulative stress from abusive supervisors and system directors in the industry, and disrespectful attitudes displayed by registered nurses and emergency department physicians in some facilities, I personally experienced years of paramedic burnout and suffer permanent psychological injury. The phlegmatic attitudes of EMS managers and the unpleasant job conditions found to cause the outflow of EMS paramedics must inspire EMS leaders to rethink the way they do business or risk losing more quality paramedics.

During the time of this study, I was employed by MedCenter Air as a clinical educator and critical care paramedic, Gaston College as the program director in emergency medical science, the American Heart Association's Training Center Coordinator for Gaston College, Atrium Healthcare as a special events paramedic, Novant Health as a National Basketball Association courtside paramedic, Union County (SC) EMS as a paramedic, and South Piedmont Community College as a paramedic instructor. My background is an important component of this study because it provides a pathway to build and maintain a relationship with participants. My roles for this case study were to create research questions for personal interviews, identify and contact appropriate participants, coordinate and conduct interviews, collect data from the interview instrument, understand participants' responses, and obtain archivable data from

previous studies of the same research for triangulation purposes to support data from participants' interviews.

As a paramedic with more than three decades in the industry of emergency medical services, I connected with participants through a common bond of shared experiences. My role was to ensure reliability and validity, gather follow-up data where applicable, protect the confidentiality of participants, and ensure the credibility of the data and the study. In this study, I applied qualitative standards of dependability, credibility, and transferability by adhering to the roles listed in Table 3.

**Table 3**

*The Role of the Researcher*

The Role of the Researcher
<ul style="list-style-type: none"> <li>• Function as the primary data collection tool.</li> <li>• To understand qualitative research practices.</li> <li>• Build the researcher-participants relationship.</li> <li>• Ask questions and observe participants.</li> <li>• Function as a cultural broker.</li> <li>• Hire translators when necessary.</li> <li>• Disregard participants' personal information to protect their privacy.</li> <li>• Monitoring and reducing bias.</li> <li>• Developing competence.</li> <li>• Collect data.</li> <li>• Link the gathered data with technology to produce valid findings.</li> <li>• Analyze data.</li> <li>• Present all findings.</li> <li>• Safeguard the participants and their data.</li> </ul>

*Note.* Details from Jackson (2017), Lazzaro-Salazar (2019), Råheim (2016), and Wray et al. (2017). Items in Table 3 are under Fair Use. Copyright Disclaimer under Section 107 of the Copyright Act 1976; Allowance is made for “Fair Use” for purposes such as criticism, comment, news, reporting, teaching, scholarship, and research. Fair use is a use permitted by copyright status that might otherwise be infringing.

For this study, participants were required to be either currently credentialed paramedics who had at least 3 years of EMS paramedic experience in the Carolinas or previously credentialed paramedics having worked EMS in the Carolinas for 3 years or more, but who have left the industry in pursuit of another occupation within the last 10 years.

### **Participants**

The process in which participants are selected for a study is defined as the “sampling method” (Setia, 2016, p. 505) and is categorized as either probability or non-probability. Participants for this study were chosen through a non-probability purposeful sampling method. “Probability sampling – based on chance events (such as random numbers, flipping a coin, etc.); and non-probability sampling – based on researcher's choice, the population that is accessible, and available” (Setia, 2016, p. 505). Non-probability sampling denotes that all members within a group do not have equal opportunities to participate in a study (El-Masriand, 2017) and purposeful sampling involves a process where participants are selectively chosen by the researcher based on his or her judgment (Campbell et al., 2020; Dudovskiy, 2012). Convenience sampling was considered for this study; however, it is not appropriate or chosen because the method would “involve enrolling participants who are most conveniently available” (Knechel, 2019, p. 333) rather than the chosen method of selecting participants based on the researcher’s judgment, and participant criteria.

The participant criteria for this research project consisted of non-probability purposeful sampling from within a specific group (paramedics) and a specific geographical location (SC and NC). The researcher personally chooses EMS paramedics who have the experience level in the industry, based on minimal requirements for the study and the researcher's judgment, to provide detailed and in-depth answers to the research questions. Participants for this qualitative study were EMS paramedics who possess a minimum of 3 years of full-time experience in the industry or who have previously worked as EMS paramedics with a minimum of 3 years of full-time experience in EMS within the last 10 years.

Procedures for selecting participants included identifying current and previously certified paramedics, through the SC and NC paramedic credentialing information system (CIS) and the National Registry of EMTs (NREMT). I built a rapport with participants to yield the most complete and the most appropriate data for the study. Establishing working relationships with participants included building a rapport with participants through a common bond of experience and the interest shared from decades in the profession between myself and participants. Interview proceedings required participants to answer open-ended predefined questions during personal human interactions with the researcher. All participants selected for this study were either employed as EMS paramedics in SC or NC or they have left the industry for an occupation outside EMS within the last 10 years. Measures taken assured the ethical protection of participants adequately consisted of selecting paramedic participants who met or exceeded the 3 years of full-time employment experience qualifications.

To produce the most valid and reliable data, a standard of field experience in the industry was necessary. This research requires 3 years of full-time EMS paramedic experience, as the standard, based on similar standards that are required by the Commission on Accreditation of

Medical Transport Systems (CAMTS), the International Board of Specialty Certifications (IBSC), and the Board for Critical Care Transport Paramedic Certification (BCCTPC). CAMTS and the IBSC and BCCTPC are the only two specialty care paramedic accreditation or specialty care certification agencies in the United States. Each of the paramedic specialty credentialing agencies shares similar standards of EMS paramedic tenure of 3 years as a requirement or a recommendation for paramedics to hold specialty certifications in the industry (CAMTS Standards, 2019; Welcome to the IBSC and BCCTPC, n.d.); thus, reasonable tenure of 3 years EMS paramedic experience for a research project on identifying or define specific problems in the industry was adopted as a minimal requirement for this research project. Similarly, selecting currently employed and previously employed paramedics to participate in this study was sought by sending invitations to potential research participants through South Carolina and North Carolina EMS credentialing information system's (CIS) database, the National Registry of EMTs paramedic database, social media, and personal emails.

### **Research Method and Design**

The purpose of this study is to explore why paramedics choose to leave the emergency medical services industry in SC or NC and how the attrition rate affects patient care. The qualitative methodology is the approach that best aligns with research questions in a study on paramedic staffing deficits, how it affects KPIs in EMS, and what effects it has on prehospital patient care. The research questions in this study were not to collect and analyze numerical data, as required by quantitative studies; therefore, a qualitative design was the only method that was appropriately fitting. The research questions in this study dictate a qualitative methodology because each question sought to explore factors contributing to 'what,' 'why,' or 'how' phenomena (Yin, 2018) to address a situation, event, individual ascribing a human or social

problem, personality characteristics, or human behavior (Creswell & Creswell, 2018). The research questions, literature review, participant interviews, and descriptive statistics in this study helped to identify the problems in emergency medical services that contributed to paramedic deficits in EMS and ultimately results in inferior patient care through the ‘what’ phenomena line of questions; thus, driving the study design to a qualitative model.

### ***Qualitative Methodology***

The general framework for this study was to explore phenomena of what factors contribute to paramedics’ intention to leave emergency medical services in the search for another occupation, why some paramedics voluntarily terminated their position with an agency to work for another agency, and why some paramedics have left the EMS industry entirely. Qualitative methodologies in research are iterative, systemic, and repetitive structures to analyze data (Mills et al., 2010) from answers provided by participants about the causes and effects of circumstances they have experienced (Creswell, 2015). A qualitative methodology has a flexible framework, in comparison to a rigid framework that is noted in quantitative research, to elicit and categorize responses to questions. A qualitative research method and case study design in this study provided paramedics with opportunities to reflect on their professional life experiences from the historical events they encountered at some point during their career. The participants were asked to describe events pertinent to the research questions and to identify factors that have contributed to paramedic shortages in the industry of EMS.

### ***Case Study Design***

This is a qualitative multiple case study. In qualitative multiple case studies, researchers collect, interpret, and code data from the answers obtained during personal interviews, verbal interactions, and observations (Farooq & De Villiers, 2017) through reflexivity. Reflexivity

applies to this study because it encouraged the participants to reflect on their experiences in EMS when answering open-ended qualitative research questions to provide necessary data. The data needed for this study was solicited information about problems in EMS that contribute to staffing shortages and why individuals may not be attracted to the occupation.

For this study, data were collected from information given by participants during personal interviews. The interview instrument provided opportunities for participants to verbally describe their experiences, through reflexivity, that were pertinent to the research questions. After the data were collected, they were interpreted to identify codewords specific to the study. The data were then electronically analyzed through NVivo 12 for Windows software and the research proposal was written. Unlike quantitative studies where data are measurable by numeric values, qualitative analyses are open-ended, and data gathered from participants' answers unfold in unpredictable schemes (Woolf & Silver, 2018).

NVivo 12 for Windows provided the tools that were necessary for the researcher to analyze and organize unstructured, or non-numerical, data obtained from subjective answers provided during this qualitative case study. The software provided an electronic means to classify, sort, align, and link data according to codewords that addressed the study's research questions. After the data were coded, archival data were obtained primarily from the South Carolina EMS Association and secondarily from the American Ambulance Association to serve as triangulation and descriptive purposes to further validate the data from the participant interviews.

### ***Summary of the Qualitative Case Study***

A qualitative methodology and the case study design provide paramedics with opportunities to reflect on, through reflectivity, and describe personal and professional

experiences from the historical events they encountered at some point in their lives. Reflexivity is not only about a cognitive process of reflecting on the past, but also an integrated part of predicting the future “through the practice of anticipation (Hewitt, 2016, p. 1156). Reflexivity is a cognitive process of logical thinking that defines “a balance between analysis and synthesis, concrete and abstract, experiential and experimental thinking” (Cunliffe, 2020, p. 65) when examining one’s life experiences (Johnson, 2017). To promote and encourage paramedics to answer the research questions, I built a rapport with the participants through a common bond of reflexivity.

Reflexivity during qualitative research is an instrument or design that helps build a rapport with participants to elicit specific answers for interpreting and coding data. Once the data for this research project were collected, interpreted, and coded, there was a stronger understanding of problems contributing to paramedic shortages in EMS. The goal of this qualitative case study was to provide a deeper understanding of the reasons for paramedic attrition in the emergency medical services industry and what contributing factors lead to poor patient outcomes in the out-of-hospital environment.

### **Population and Sampling**

In most research studies, sample sizes can vary and is dependent on the nature of the data being sought and the estimated participant responses (Alshibly, 2018). For this study, the primary method for data collection was the interview instrument of 20 participants from SC and 20 participants from NC for a total of 40 participants. Secondly to the interview instrument, archival data were sought for triangulation and descriptive purposes only. Health services research, including studies involving the industry of EMS, is often observational and cross-

sectional without an experimental group “with multiple outcomes measured simultaneously” (Pye et al., 2016, p. 1).

A qualitative study is usually conducted within a specific population, or group, of interest that meets the inclusion criteria for the research project. A study on healthcare leadership, staffing turnover, and patient outcomes “likely involves collecting a variety of data” (Pye et al., 2016, p. 1) such as participant interviews as the primary source of data and archivable data, secondarily, for triangulation purposes. Literature concerning sample size usually revolves around an expected data saturation point, two participant groups to compare or differentiate data, unlikely or unfavorable events in practice, and outcomes that can only occur through good planning (Pye et al., 2016). Because the paramedic population in SC and NC consists of approximately 13,500 paramedics and requires much data collecting, it was impossible and impractical to interview a large percentage of the paramedics, as the sample size, who either work in the industry or have since left the industry within the last 10 years.

No more than 40 participants were identified to participate in this case study. “A study using more participants than necessary is a waste of resources and the time and effort of participants” (Pye et al., 2016, p. 3). The sampling for this study consisted solely of personal interviews. Non-probability sampling was chosen for this study because this method provided the researcher with the autonomy to personally choose participants “based on researcher's choice, the population that was accessible, and available” (Setia, 2016, p. 505). Paramedics who were selected to participate in the interview instrument were either employed paramedics who had at least 3 years of full-time experience in emergency medical services in South Carolina or North Carolina or previously employed paramedics who had at least 3 years of full-time experience in

emergency medical services in South Carolina or North Carolina and left the industry within the most recent 10 years.

### *Discussion of Population*

In this study, the primary research instrument was a semi-structured, in-depth interview between the researcher and participants to identify reasons for paramedic attrition and the potential effects it has on the quality of patient care in the out-of-hospital environment. The analytical objective of this study was to provide participants with opportunities to describe individual experiences in the industry through an open-ended question format. Most participants provided an answer to all research questions in the interview instrument; however, there were risks to the participants such as fatigue during the 60-minute interviews. A 5-minute break was provided every 15 to 20 minutes to mitigate this risk and to offer the participant the opportunity to regroup and clear their mind. Additionally, there was a risk that the questions, answers, or personal opinions could have stirred up uneasy feelings if they remembered a negative experience. To mitigate this risk, the participant had the option to skip the question.

Limitations were also concerning in this research project. One limitation during this study was the number of individuals who had changed occupations and no longer maintain their paramedic credentials which made it difficult to track participants for the study and validate their experience as qualified participants in the study. An additional limitation existed if any of the participants dishonestly disclose their full-time experience as EMS paramedics. Paramedics who did not have the minimal requirements of three years of full-time advanced life support experience, specifically in EMS, could have provided inaccurate answers to the research questions and skewed the data. Although SC and NC Credentialing Information System, or Continuum, is a database that maintains records of a prehospital clinician's certification, the

system does not differentiate an individual's emergency medical technician's initial certification date from their initial paramedic certification date which was a limitation when validating participants' years of service at the paramedic level.

Despite limitations of participant relevance, individual, or single participant case studies can provide “a new, deep and nuanced understanding of previously unexplored phenomena” (Boddy, 2016, p. 428). During the interview instruments of this study, all participants were required to self-disclose their length of time as paramedics and their EMS experience levels. Paramedics who chose another career as a paramedic (i.e., community paramedicine, emergency department, private industry, critical care, flight paramedicine, non-emergency medical transport, etc.) and individuals who sought an occupation outside the paramedicine industry were qualified candidates. Participants were required to have at least 3 years of full-time paramedic experience in emergency medical services because the Commission on Accreditation of Medical Transport (CAMTS) requires paramedics to have three years of experience at the full-time advanced life support level before they are eligible to function as paramedics at a critical care or specialty care medical transport level (Commission on Accreditation of Medical Transport Systems, 2018); thus, this study required the same minimal paramedic experience industry standard.

### ***Discussion of Sampling***

A sampling framework defines sampling units, or individuals from within a specific group, and the samples' specific locations (West, 2016). Martínez-Mesa et al. (2016) defined sampling “as a finite part or subset of participants drawn from the target population” (p. 326). Purposeful sampling was the chosen research method of sampling for this study. This method of sampling promotes a study's trustworthiness of data and strengthens the rigor of a study through its structure where participants are selectively chosen by the researcher; thus, increasing the

depth in the level of understanding (Campbell et al., 2020). Purposive sampling is a non-probability sampling method, which identifies why specific traits are common in a particular group, and in which the researcher chooses members from within a specific population or group based on his or her judgment (Dudovskiy, 2012). Participants who met the inclusion criteria and who were chosen for this study were invited to participate in a live interview. As previously described, the population for this study was individuals who had at least 3 years of experience as paramedics in emergency medical services in SC or NC and who were currently working in the industry at the time of the interview or individuals who worked as paramedics in emergency medical services in SC or NC within the last 10 years and no longer working in the industry.

According to the top-level management at SC DHEC Division of EMS and NC Office of EMS, there were 3217 paramedics in SC and 10355 paramedics in NC as of September 3, 2020. One reason there were more paramedics in NC, in comparison to SC, was that there were more EMS and ambulance organizations in NC. Due to the number of certified paramedics in SC and NC, the interview instrument was executed by sampling a smaller target population to correspond to the research as representatives of “the entire set of subjects whose characteristics were of interest to the research team” (Martínez-Mesa et al., 2016). The relevance of the characteristics of any study’s discussion of sampling hinges on the sample size and the quality of sample selection (Pye et al., 2016). The maximum number of participants, or the sample size, that was planned for this study was 40, which included 20 EMS paramedics from both SC and NC who were currently employed full time and who met the inclusion criteria, 20 previously employed EMS paramedics from both SC and NC who also met the inclusion criteria. Twenty participants from the two interview categories were proposed because the saturation of data was

expected in the interview instrument before the maximum number of participants in each group of this study was reached.

The saturation of data was expected in both interview categories of EMS paramedics which included paramedics who were working in SC or NC at the time of the study and previously employed paramedics who once worked in either SC or NC. Although it was highly unexpected and unlikely, if saturation of data was unobtainable in one or both groups, personal interviews of 20 participants in each category would have provided enough data to answer the research questions and would have satisfied the purpose of this study. Interviewing participants beyond the saturation of data or interviewing more than 20 participants in each category would have presented no additional benefits for this study. While the interview instrument of this study was lengthy and could have lasted up to 1 year, obtaining and defining archivable data, for triangulation, from the South Carolina EMS Administration or the American Ambulance Association for triangulation and descriptive purposes of this study was expected to take no longer than one week.

The sampling method was a purposive sampling of current paramedics who were working in EMS at the time of the interviews and previous paramedics who left the industry to pursue another occupation before they were interviewed. The sampling that was planned for this study consisted of 20 current paramedics who worked in EMS at the time of the interview instrument and 20 individuals who once worked as EMS paramedics but had left the industry for another occupation. Participants for this study were personally chosen by the researcher and the data were collected from open-ended research questions. To assure that the data obtained were consistent and reliable, only current and previous certified paramedics who met all of the inclusion criteria were exclusively selected to participate in the study.

### *Summary of Population and Sampling*

Eligibility participant criteria for this study consisted of current EMS working paramedics who had at least 3 years of full-time experience at the advanced life support level, or previously employed paramedics who had at least 3 years of full-time experience in emergency medical services at the advanced life support level and were no longer working as an EMS paramedic. Eligibility criteria were not disclosed during the survey; thus, all participants who did not meet all eligibility requirements were eliminated. It was possible; although unlikely, for paramedics who knew the inclusion or exclusion experience requirements to falsify their full-time paramedic experience; therefore, adding to the limitations and risks in this study. While there was a potential for unforeseen limitations and risks among the population and sampling in addition to those mentioned, they were relatively minimal and plans were in place to recognize, mitigate, and disclose any conditions or contributing factors.

### **Data Collection**

The primary source of data collecting was the personal interviews of 24 participants. There was a maximum number of 40 participants planned for the interview instrument of this study; however, data saturation was achieved from 24 participants. During the planning phase of this project, it was determined that any data beyond 40 participants would not be included because any additional data beyond that point would have been repetitive. In addition, it was identified that interviews would not continue if saturation of data was achieved. The interview data collecting phase for this study was proposed for approximately 16 weeks exclusively in SC and NC; however, this phase was completed in 14 weeks, partially due to the saturation of data being reached. The data were analyzed using computer software (NVivo 12 for Windows). The software allowed the researcher to classify, sort, and arrange information by examining

relationships in the data and combining analysis from searching, linking, and shaping the answers provided by participants in the form of codewords.

Information obtained from personal interviews between the researcher and participants was coded to identify segments of data that aligned with the reasons for the study and the research questions. Before the coding process, a preliminary review of all transcripts was done to verify that the gathered research data addressed the research questions. The location and time of interviews for data collection were scheduled according to the convenience and availability of participants. Inclusion and exclusion criteria, work history, demographics, professional experience, and future goals were ascertained as identified by participants. Although there were inclusion and exclusion criteria which mainly consisted of 3 years of full-time paramedic experience, this information was not disclosed during the data collection phase of this study to eliminate participant bias, limitations, and risks.

### *Instruments*

The researcher, an instrument in this study, facilitated and guided the structure of the research through open-ended interview questions with participants, and archivable data obtained from the South Carolina EMS Association or the American Ambulance Association for triangulation and descriptive purposes. For the interviews, an interview guide was first created as an instrument to identify participants' inclusion and exclusion criteria before any data were collected (Appendix A). Secondly, the interview guide was a roadmap to guide the research questions and identify their relationship to the research questions (Appendix B). Participants selected for the interview instrument of this study were chosen from currently certified and previously certified paramedics who the researcher deemed to have a minimum of 3 years of full-time EMS paramedic experience in the industry. Twenty EMS paramedics within the

combined states of SC and NC and 20 previous EMS paramedics within the combined states of SC and NC who left the industry in the last 10 years, or until data saturation occurs in both groups, were sought for the personal interview instrument of the study.

During personal interviews, the researcher interviewed participants and coded answers that addressed the open-ended research questions through NVivo 12 for Windows. Qualitative research questions are open-ended questions that can evolve during the interviews (Braun et al., 2017). A common focus in obtaining answers from participants during a study is to explore the life experiences of individuals or groups (Braun et al., 2017) and transcribe the data to a digital word format through a computer software instrument like NVivo 12 for Windows. Participants' answers that were pertinent to the research questions and descriptive stories about their professional experiences that were pertinent to the study were recorded on a digital voice recorder, transcribed to a written format, and assigned to specific data categories that best aligned with each given answer.

In addition to the interview instrument, and for validation of data obtained from participants' interviews, archivable data were used for gathering specific data through the South Carolina EMS Association and the American Ambulance Association. Archivable data were used because of the advantages that are listed in Table 4. Because this study included working EMS paramedics and previously employed paramedics in SC and NC, selecting participants for the interview instrument was confined to small geographical areas of both states. In SC, current and previous paramedics were selected from the counties of York, Union, Cherokee, Abbeville, Lancaster, and Greenwood. In NC, current and previous paramedics were selected from the counties of Mecklenburg, Cabarrus, Lincoln, and Stanley. Data that were discovered from participants' interviews were consistent with the data extracted from the literature review's

discovered themes and the supporting evidence that was discovered from achievable data. Conversely, archivable research to help validate the data from interviews has empirical advantages like allowing the investigation of data that would be difficult or impossible to gather by any other means (Advantages of Using Archival Materials, n.d.). Data obtained from a qualitative research instrument, such as personal interviews, will have more rigor when a secondary triangulation method is used.

**Table 4***Advantages of Using Archivable Data for Triangulation*

- 
1. Ease of use.
  2. Low cost.
  3. Storage and accessibility.
  4. Data are already collected.
  5. Substantial savings of time.
  6. Minimal effort.
- 

*Note.* Details from “Advantages of Using Archival Materials” (n.d.).

***Data Collection Techniques***

During this study, data were collected from participants who addressed the research questions by identifying what primary factors influence paramedic shortages in the states of SC and NC and what primary factors influence paramedic retention in SC and NC. Before any interviews, participants were required to first read and sign a form of consent which was emailed to the participants ahead of time. The consent was acknowledged, signed, and returned before they participated in the live interview. “An ethical, informed consent process requires that

potential participants understand the study, their rights, and the risks and benefits” (Nusbaum et al., 2019, p. 937).

The investigation included data from the personal interviews primarily and the archivable data secondarily as two independent instruments for different purposes of the study. Paramedic participants selected for interviews were asked about their professional experiences in emergency medical services. These interviews were held in private settings where no one could overhear the conversations. The interviews were recorded on a password-protected digital voice recorder and downloaded to a password-protected computer and saved as voice files. To determine what impact paramedic attrition has on EMS key performance indicators, sufficient data were obtained to investigate the reasons paramedics leave the industry, how the paramedic deficit affects EMS system performance, and how paramedic staffing deficits contribute to a direct and indirect decline in the quality of patient care throughout SC and NC.

#### ***Data Organization Techniques***

The gathering and organizing of data were obtained from two research instruments, personal interviews primarily and archivable data secondarily for triangulation, to increase the validity and reliability of the study. The two research instruments were independent studies in which the data were gathered from archivable files to validate the data that were obtained from the participant interviews. Obtaining data from two different instruments for two different purposes, instilled rigor in this study. Data obtained from one instrument alone were less likely to strengthen the study; therefore, evaluating, organizing, and documenting the data from interviews and archivable files independently triangulated the data that were collected and strengthened the study’s validity. Archivable data are an attractive source of information for

triangulation purposes because documents are in publicly accessible domains and obtaining the information does not require the authors' permission (Obaid & Gul, 2016).

### ***Interviews***

Qualitative research is often accused to lack rigor in comparison to quantitative analysis; thus, it is important to clarify data and produce additional research criteria that demonstrate rigor in qualitative analysis (Maher et al., 2018). Participants for interviews were chosen from a random group of current EMS paramedics and a random group of previous EMS paramedics who have terminated employment with an EMS agency. It was assumed that the data obtained from interviews were trustworthy; however, there were risks that some interviews could have provided inaccurate information. While most of the participants answered all the questions and answers were truthful, there were still risks of inaccurate data that could have weakened the validity of the data. These risks potentially included biased information and the participants could have become fatigued, stressed, or unpleasant memories could have been recalled by some of the participants during the interviews. To mitigate the risks and limitations during the interviews, participants were provided with multiple breaks, and they could have walked away from the interviews at any time to prevent fatigue, reduce stressful situations, and stimulate deeper thoughts to better answer the research questions.

### ***Archivable Data***

Archivable data were obtained primarily from the South Carolina Emergency Medical Service Association (SCEMSA) located in Columbia, SC, and secondarily from the American Ambulance Association (AAA). The two organizations were evaluated for the most appropriate archival data following the interviews. Additional data were requested from the NC Office of EMS, located in Raleigh NC. According to the director of the NC Office of EMS, the state office

has not conducted any studies on paramedic attrition or paramedic shortages in NC and there were no archivable data in the state EMS office. In addition, archivable data were requested from the National Registry of EMTs; however, the organization also reported that no archivable data were available. National Registry of EMTs is often a source of archivable data because the organization has a research fellowship program that provides employment opportunities for EMS professionals who are seeking doctoral degrees, with a concentration in EMS, through Ohio State University (National Registry Research Department, 2021); however, the NREMT reports they have no archivable data on paramedic shortages and its conditions.

“The South Carolina EMS Association (SCEMSA) is a nonprofit organization committed to creating a unified voice for EMS providers across all sectors in the state of South Carolina” (SC EMS Association, n.d.). Similarly, the American Ambulance Association safeguards the future of EMS through research, advocacy, leadership, and education (American Ambulance Association, 2020). Although no archivable data were available from the NREMT on the topic of this study, the organization is often a source for EMS data. The National Registry of EMTs provides uniform national standardized testing for EMTs and paramedics, establishes national credentialing and testing standards for EMS personnel, helps nationally credentialed personnel maintain national EMS certifications, conducts research on EMS topics, and makes its research data available to researchers (National Registry Research Department, 2021). Research data that were unearthed from archival files that were provided by the South Carolina EMS Association and additional data obtained through the American Ambulance Association were used for triangulation and descriptive purposes to ensure the validity and soundness of the data gathered from the participants' interviews.

“Archival data are that data which are gathered and stored before the commencement of the research, intended for later use” (Das et al., 2018, p. 139). The primary advantage of using archivable data over other methods, such as surveys, is the “ease of availability and low cost” (Das et al., 2018, p. 139). Archivable data gathering from the South Carolina EMS Association, or the American Ambulance Association were necessary to solidify the answers provided by the interview instrument of this study. This form of data gathering was used for triangulation and descriptive purposes to strengthen the trustworthiness of the study.

Archivable databases are instruments that will provide researchers with valid and reliable data that are easily accessible and does not require the authors’ permission (Obaid & Gul, 2016). To conclude this research project, achievable data files provided additional information about conditions contributing to EMS paramedic attrition, EMS paramedic staffing shortages, and how these conditions affect EMS quality of care in the prehospital environment or other EMS KPIs. Data obtained from the archivable files validated the data that were gathered from the interview instrument. Once data were gathered from the South Carolina EMS Association and the American Ambulance Association’s archivable files, they were recorded separately from the interview instrument; thus, validating the data from the interviews, providing evidence to the literature and interviews, and drawing conclusive findings to the research questions.

### ***Summary of Data Collection***

In summary, the general problem addressed was the increasing staffing shortage of paramedics resulting in a negative impact on the quality of patient care. This study’s research questions were to identify reasons for paramedic attrition, specifically in the industry of emergency medical services operating in South Carolina and North Carolina, and further investigated how the staffing shortcoming affects patient care in the out-of-hospital environment.

The interview guide was the roadmap that guided the research questions, and it included the inclusion and exclusion criteria that were addressed before any data were collected. For data collecting, paramedics who were working in the EMS industry were invited to participate in the interview portion of this study through social media. After each interview was completed, data were downloaded into the password-protected computer for storage and coding purposes. There were predefined instruments used in this study (e.g., NVivo 12 for Windows) that required themes and a coding table. The themes and codes could not be developed until answers were provided by the participants.

### **Data Analysis**

In qualitative research, data are gathered, coded, and the findings of the research are usually expressed in themes that tell the participants' stories (Connelly & Peltzer, 2016). The data analysis process of this study was a continuous process that began with the first participant's transcript. The first transcript provided insight for adjustments of interview questions and any realignments in the sequential order of questions for the remaining interviews with participants. Qualitative research interviews can vary; therefore, answers provided by participants can identify new areas to explore. All reassessments, realignments of questions, and changes would have been disclosed in analytical memos; however, there were no changes to report.

Before the coding process, a preliminary review of all transcripts was done to verify that the gathered research data addressed the research questions. This process was done with a small beta test group of two participants who were separated from the official data collection group. The purpose of the beta test group was to evaluate the quality of the interview questions, evaluate whether interview questions aligned with this study's research questions, propose any realignment in the sequential order of the interview questions, and recommend any additional

changes before the study began. Data from the beta test group were not included in the dataset. Any changes or realignment of questions would have been recorded in analytical memos; however, there were no changes recommended by the beta test group.

Once the study was underway, a coding method to identify segments of data that align with the research questions was used. For example, coding was developed with preliminary tags to word identifiers such as “retention,” “attrition,” “recruiting,” and “leaving.” The analytic strategy of this study identified reasons for paramedic attrition in emergency medical services and then the study investigated how the outflow of paramedics affects prehospital patient care. The data analysis process consisted of coding answers and developing themes to simplify, transform, discover, and categorize useful information obtained from the participants.

After sorting and analyzing codes, themes were developed which described the participants’ answers obtained during conversations between the researcher and participants (Connelly & Peltzer, 2016). The themes were developed after the researcher reviewed the answers to the research questions, categories, subcategories, and the identifying links between categories and concepts that generated the data. The data were collected from an open dialogue with participants, and it was analyzed for themes (Connelly & Peltzer, 2016). The theme's depth is proportional to the richness of answers and the data obtained from interviewing participants (Connelly & Peltzer, 2016).

### ***Coding Process***

Coding is a process of contextualization (Maher et al., 2018) to transform collected information, data, or observations into sets of specific categories to provide meaningful results from a study (Allen, 2017). Data that were gathered during this qualitative study was extensive or convoluted; therefore, software coding with NVivo 12 for Windows was used to sort, track,

and code data. This coding instrument was beneficial because it provided a systematic approach that was more efficient and accurate in comparison to manual coding. Additionally, triangulation authenticated the coded data that were obtained during the interview instrument. Triangulation occurs when the collected data from participants' answers are compared with archival data; thus, producing a structure where other researchers could replicate the study and obtain the same results (Grant, 2019). Triangulation is "using multiple methods to understand a phenomenon" (Grant, 2019, p. 101).

Computer coding packages, such as NVivo 10 for Windows, are often difficult and time-consuming to learn (Belotto, 2017); however, other coding options like manual coding are too time-consuming, results are often subjective to the researchers' interpretation, and results could be inconsistent if other researchers were to replicate the study (Maher et al., 2018). The coding software (i.e., NVivo 12 for Windows) that was used for this study reduced and transformed participants' answers into categories of data that provided useful information for developing themes (Allen, 2017). Electronic coding software is a digital tool that usually supports a "sequential form of cognition whereas manual methods and tools support the relational" (Maher et al., 2018, p. 4).

The coding process in qualitative research is a process of collecting, categorizing, and thematically sorting data to provide an organized platform that constructs the study's outcomes (Williams & Moser, 2019). The coding process in qualitative research is to minimize the amount of data, maintain the study's meaning, and define the main idea (Maher et al., 2018). In this qualitative case study, participants were interviewed, and the sessions were recorded on a password-protected digital voice recorder. After each interview, the recorded data were downloaded to a password-protected computer to be coded electronically through the software's

thematic coding process. After all the data were coded, themes were developed which iterated, or explained the meanings of, the participants' stories.

### ***Summary of Data Analysis***

The goal of a data analysis summarization is to explain the meanings of the participants' answers in a reduced and structured format (Belotto, 2017). Data analysis represents the most important process of qualitative research; however, it is also the most difficult step (Sechelski & Onwuegbuzie, 2019). The analysis of data consists of research design, sampling, data collection, analysis, sorting, coding, and summarizing the data to align a link between different themes and subthemes (Belotto, 2017; Sechelski & Onwuegbuzie, 2019). After the data has been collected and coded, a data reduction process is introduced to identify the key essential themes and secondary themes (Belotto, 2017). By identifying reasons for paramedic attrition, through the coding process, suggestions to potentially improve key performance indicators in the industry were addressed. A summarization of the data analysis on the reasons for paramedic attrition in emergency medical services and how it affects patient care was inscribed to help raise awareness of the challenges in EMS. In addition, I made recommendations from the findings of this study, on ways to stop the outflow of these highly skilled pre-hospital patient care professionals which should also contribute to reducing patient morbidity and mortality.

### **Reliability and Validity**

Qualitative research is more complex and is often said to be less reliable than quantitative, or traditional, studies (Cypress, 2017). Researchers have been concerned about the trustworthiness rigor of reliability and validity of qualitative studies in past years (Cho & Trent, 2016; Cypress, 2017; Finlay, 2016; Olson et al., 2016). Quantitative research is frequently referenced as the methodology that is more credible because it is thought to produce more

reliable findings in comparison to qualitative methods; however, qualitative studies can produce specific findings that are not possible in quantitative analysis (Olson et al., 2016). Qualitative research arrives at findings by means that are not produced by statistical studies while quantitative research produces measurable facts that are supported by scientific or positivist paradigms (Cypress, 2017).

Rolfe (2010) described three opinions that exist on judging the credibility of qualitative research: (a) the adoption of positivist research terms such as reliability and validity to better define rigor in qualitative studies; (b) the realist approach which rejects the positivist approach of terms like reliability and validity because of the differences in research instruments between qualitative and quantitative methodologies; and (c) the methodological techniques which include member checking, audit trails, negative case analysis, prolong engagement with participants, triangulation, and peer debriefing. The realistic approach is the most popular instrument in healthcare research because it “promotes the use of alternative terminologies such as dependability, credibility, conformability, and transferability instead of their quantitative equivalents reliability, internal validity, objectivity, and generalizability respectively to describe rigor” (Hadi et al., 2016, pp. 641-642).

Reliability is the consistency of a study, while validity defines a study’s soundness. Qualitative research investigates how or why something happens as opposed to quantitative research, which investigates topics where research findings are measured by numeric values (Husbands et al., 2017). When a study’s objective is to identify why something happens and its effects on the outcomes, such as the topic of this study, both reliability and validity will be obtained through the triangulation of two qualitative research instruments which are personal interviews with participants and archivable data as an independent investigative instrument to

validate data obtained from the personal interviews. To increase the reliability and validity of this study, member-checking was employed to make sure the data were recorded and addressed as the participant intended.

### ***Reliability***

In qualitative studies, consistency of data must be obtained to promote a study's integrity (Hadi et al., 2016). To promote and validate reliability, an interview guide was created (Appendix B) and used with each participant for consistency between interviews. This qualitative study consisted of interviewing participants "who were central to the research topic" (Hadi et al., 2016, p. 641); therefore, reliability was established when participants' answers were consistent across time (Creswell & Poth, 2018). Data that were collected during this study were transcribed from audio recordings of verbal interviews to word-text files consisting of codes and themes (Hadi et al., 2016).

During the interviews, participants were asked to answer questions that described their work experiences. The answers provided by each participant were transferred into valuable information and were used as data to help answer the research questions and the overall problem of recruiting, hiring, retention, attrition, and burnout that are experienced by paramedics working in emergency medical services. Participants were interviewed until saturation of data was achieved, which happened before the target quantity of participants could be reached. Saturation of data would be highly probable if answers were provided by the first 20, or 50%, of the participants; thus, no further data would be discoverable from that point (Faulkner & Trotter, 2017). After the data reached the point of saturation and the information obtained from the secondary source was consistent with the answers provided from the personal interviews, credibility and rigor in this study were articulated (Rolfe, 2006).

### *Validity*

Trustworthiness rigor defines a study's confidence and soundness (Hadi et al., 2016). Validity is the product of research methods plus the methods' accuracy, or if a specific method measures what it should measure (Lock & Seele, 2018). For a research project to be valid, it is also necessary to select a valid number of participants for personal interviews to produce content and data that address the research questions. A sample between 3 and 20 participants can produce a valid result for a study, even when the study is complex, and a valid baseline can be achieved from a research sample between 5 and 10 participants (Six & Macefield, 2016). To authenticate the validity of this study, interviews that were conducted between the researcher and participants aligned with the research questions, data measured what it was intended to measure, and I confirmed that all data were recorded and coded accurately until the saturation of data were achieved, or the maximum quantity of participants planned for this study were interviewed.

Although there were a specific number of target group participants identified, the study ended when data saturation occurred. This study had targeted 40 participants for interviews; however, data saturation occurs at 24 participants, which eliminated the need for the remaining 16 interviews. Data saturation is the point in research when no new data are discoverable (Faulkner & Trotter, 2017), or the data obtained from participants becomes repetitive; thus, new data from interviewing any additional participants become unlikely (Beery, 2010). The data obtained through triangulation from the interviews and the archivable data sources became credible once consistency of answers was identified between different instruments and data saturation was prevalent. Triangulation is the process of two different data instruments to eliminate any bias that may be present in a single research instrument (Long & Johnson, 2000). This study produced valid results when all data were consistent between participants' interviews,

the review of literature, and the descriptive and triangulation purposes of archivable data; thus, validating the data from the interviews.

### ***Summary of Reliability and Validity***

In summary, reliability is the measurement of consistencies while validity defines the accuracy of the measurements. Reliability denotes that subsequent researchers would arrive at the same conclusions if they were to perform the same research under the same conditions, the same environment, and the same structure (Lock & Seele, 2018). A study can be reliable and not be valid; however, it cannot be valid without being reliable (Lock & Seele, 2018). The purpose of the qualitative research method and case study design was to investigate the breadth more so than the depth of paramedic attrition, paramedic shortages, and how these factors affect pre-hospital patient care, while combating and overcoming challenges this study presented.

Challenges are presented in qualitative studies when there are inadequate time and data parameters, research data are lacking, resources are unavailable, or there are not enough sample subjects (Creswell & Poth, 2018). Challenges were encountered during this study; however, most of the issues that could damage the reliability and validity were eliminated early because of the researcher's awareness level of the potential pitfalls. As mentioned previously, if data collecting had not included multiple instruments, the study would have revealed one-sided values. If this situation had happened, which it did not in this qualitative study, the research would likely be reliable, yet validity would be questionable.

### **Transition and Summary of Section 2**

EMS agencies in South Carolina and North Carolina are experiencing paramedic shortages and high paramedic attrition. For several counties in South Carolinas and North Carolina, EMS agencies are offering sign-on bonuses for new paramedics, recruitment bonuses

for current employees for the recommendations of newly hired paramedics, or shift bonuses for paramedics who volunteer for additional shifts (NC EMS News, 2020; South Carolina Bureau of EMS News, 2020). Although bonuses and incentives are tempting during the uncertain times of 2020 and 2021, as well as the past decade, paramedic retention and staffing issues are current trends and growing problems. EMS systems across the two Carolinas are forced to close EMS stations leaving ambulances unstaffed and ultimately lengthening other ambulance response times. As previously identified, the primary reason for overcoming paramedic staffing shortages strongly suggests that EMS managers should primarily focus on stopping the outflow of paramedics while developing and implementing goals to recruit the right laypersons for paramedic training to meet growing demands; thus, drastically improving patient care in the out-of-hospital environment.

Patients who are critically ill or injured require quick paramedic response, prehospital advance life support that can only be delivered by paramedics, and rapid transport to an appropriate definitive care facility such as a hospital with a cardiac center, a trauma center, or a stroke center. EMS directors must work on identifying and accepting responsibility for the problems, implement plans to fix the problems, and develop goals and objectives to stop the outflow of paramedics. If staffing and recruiting problems persist, more patients will die before they can reach definitive care. It is highly suggestive; thus, the reason for this study is that an increase in mortality and morbidity rates in the prehospital environment is a condition of extended ambulance response times, an absence of the necessary prehospital advanced life support that only paramedics can deliver, and delayed patient transport to appropriate medical facilities, as a direct result of paramedic shortages and high paramedic attrition. This study has investigated the reasons for the outflow of paramedics. Suggestions have been made, based on

the findings from this study, for EMS agencies to recruit and retain paramedics; thus, potentially reducing patient morbidity and mortality in the prehospital environment.

### **Conclusion**

In summary, to better understand paramedic attrition and why paramedics quit the emergency medical service industry for another occupation, this study has explored paramedics' preconceived motivational expectations based on the models of Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs as identified by Abraham Maslow's Hierarchy of Needs. At the start of the investigative interviews with participants about their work experiences, I built a rapport through common experiences in the industry. Furthermore, I functioned as a mediator and the interviewer to obtain data from open-ended questions during the interview process. Once data were collected and coded, themes and sub-themes were developed which articulated the participants' stories (Connelly & Peltzer, 2016). Throughout this study, reliability and validity were monitored and maintained through checks and balances of triangulation which consisted of archivable data following the saturation of data from the participants' answers during interviews. The findings from this study did not produce an exact formula or format for EMS administrators to follow; however, it did provide data to help EMS managers become more knowledgeable about the problems contributing to paramedic staffing shortages. To better understand the paramedic staffing problems or develop objectives and solutions to rectify additional staffing pitfalls that contribute to paramedic attrition, paramedic shortages in EMS, and EMS key performance indicators, further research is needed.

### **Section 3: Application to Professional Practice and Implications for Change**

This research project has identified and proven that ambulances are not staffed which is partly because of the outflow of paramedics in the industry of EMS. Furthermore, there is no incentive to recruit people to become paramedics. This study has discovered that paramedics are fleeing EMS because of problems that they can no longer tolerate, and the managers are not making changes in their structure to improve the retention and recruitment of paramedics. The top reasons for paramedic attrition include low pay, poor management, long hours, stressors of the job, lack of respect, and poor working conditions (Majchrowska et al., 2021). While some paramedics often leave the industry for other non-clinical opportunities outside EMS, others leave their employer to work as paramedics in non-EMS industries such as community paramedicine or emergency department paramedic positions.

#### **Overview of the Study**

The general problem addressed during this study was the increasing staffing shortage of paramedics resulting in a negative impact on the quality of patient care in the prehospital environment. If the challenges contributing to paramedic shortages are not addressed, more patients will suffer futile outcomes. One study predicts that by the year 2030, there will be a critical shortage of healthcare workers, including paramedics, to care for the increasing number of patients (Castro Lopes et al., 2017); therefore, the findings from this study must be immediately addressed. The specific challenge that was discovered during this study was the EMS paramedic shortage in the states of SC and NC; thus, resulting in the declining quality of patient care. By expanding on the general problems that were discovered, an increase in the breadth and depth of knowledge on EMS paramedic shortages has been defined, and recommendations to restructure EMS to rectify the many challenges are suggested. The purpose

of this qualitative case study adds to the body of knowledge of challenges discovered from this study, other similar research projects, and the challenges identified by EMS administrators by expanding on the understanding of reasons for paramedic staffing shortages in EMS.

As addressed in this work, the findings from this study were identified from two concepts which were the review of literature and participants' interviews. The purpose of the review of the literature was to investigate paramedic shortages, substantiate reasons for the high EMS paramedic shortages primarily from attrition, and assist in making recommendations to stop the outflow of paramedics in EMS. The literature collected during this study provided a foundation on the extent of EMS paramedic shortages and how the shortages impact the quality of patient care in the prehospital environment. Moreover, the review of literature discovered that paramedic attrition is influenced by the two theories in this study's conceptual framework which are identified as Herzberg's Two-Factor Theory of Motivation and Maslow's Hierarchy of Needs. Following the review of literature, data obtained from participants' interviews added to the body of knowledge and supports the literature review's discovered themes that the outflow of EMS paramedics are conditions, or lack of conditions in some specifics, of Herzberg's Two-Factor Theory of Motivation and Maslow's Hierarchy of Needs.

### **Presentation of the Findings**

The presentation of findings on the excessive staffing shortage of paramedics and its impact on EMS performance in the states of South Carolina (SC) and North Carolina (NC) uncovered numerous struggles that lead to high paramedic attrition and paramedic shortages; thus, contributing to lengthy ambulance responses and other declining emergency medical services (EMS) key performance indicators (KPIs). The findings from this study have revealed that the struggles identified as negatively affecting the retention of experienced and quality EMS

paramedics are also implied reasons for the decline in the number of people who are interested in pursuing a paramedic occupation in EMS. Some participants felt that the EMS industry is an occupation fostering short-term employment of paramedics rather than a career encouraging long-term performance and professional growth. The top five conditions reported by current and previous paramedics as the reasons they left EMS or are planning to leave EMS is poor pay and benefits, a lack of appreciation and respect from superiors and hospital staff, inefficient or inept management, the lack of advancement opportunities, and overworked from the high number of responses to address unnecessary calls. Paramedics encounter a variety of unusual and specific situations including individuals who “tend to be overrepresented in specific social categories because of broad and pervasive social determinants that structure individual experiences of and responses to health and illness in society” (Corman, 2017, p. 607).

Saturation of data was achieved when themes were repeated by the 24 participants and no new data were obtained during individual interviews. “If one has reached the point of no new data, one has also most likely reached the point of no new themes; therefore, one has reached data saturation (Fusch & Ness, 2015, p. 1409). All 24 participants stated that their system, and EMS in general, has high attrition and paramedic shortages. Findings from the interviews conclude that EMS paramedic shortages are the primary contributor to extended ambulance responses and negatively impact the quality of patient care in the pre-hospital environment. Application to professional practice and implications for change must encompass the retention of seasoned EMS paramedics in addition to recruiting emergency medical technicians (EMTs) who have a valid interest in becoming nationally and state credentialed EMS paramedics.

*Themes Discovered*

Before themes could be discovered, participants were selected, permission from each participant was reviewed and granted by the participants before the interviews were conducted, and codes were developed in NVivo from data that were extracted from the participants' answers. Participants, who were identified and chosen in advance to participate in the interview instrument's series of questions (Appendix B), were current or previous EMS paramedics who were subject matter experts in EMS. According to Seidman (2006), subject matter experts are ideal sources of information for researchers who are searching to identify and understand the successes, failures, best practices, and challenges of the topic being studied. To protect participants' identities, all identifiable information is secured, and password protected in a secure database that will only be available to the researcher. Pseudonyms, or code names, were assigned to participants during the collection phase of the interview instrument, which is used to conceal participants' identities. The participants' identities and confidentiality will be protected. The participants' identities and their assigned code names were documented in a secured database during each interview session.

All findings were reported under the participants' assigned code names only when this information is necessary such as an independent finding, a specific quote authorized by the participant, or a data outlier. During the interviews, paramedics who were working EMS at the time of their interview were coded as group "WP" for "working paramedics" followed by an assigned individual participant number in sequential order such as "WP1," "WP2," and so on. The group of participants who no longer worked EMS were coded as group "NP" for "non-working paramedics" followed by an assigned individual participant number in sequential order such as "NP1," "NP2," and so on. If applicable, and for necessity purposes only, information is

reported as an independent finding, quote, or outlier for this study under the same given code names that were recorded during the interviews. For example, 10 working paramedic participants could identify specific issues in EMS leading to attrition which would be identified as 10 or 100% ( $n=10$ ) participants in the report or the literature. However, if an 11th working paramedic participant is identifying a different problem that is significant to the study's findings, this participant's information would be recorded as "WP11" and the given information would be paraphrased in publications; thus, better ensuring the confidentiality of the participant while identifying a data outlier in the study.

Participants for the interview instrument consisted of two groups of individuals. One group consisted of 20 South Carolina or North Carolina EMS Paramedics who are currently employed full time and who meet the inclusion requirements. The remaining group consisted of 20 South Carolina or North Carolina EMS certified paramedics or previously credentialed paramedics who no longer work EMS full-time and who met the inclusion requirements. As previously identified, 40 participants from two interview categories were proposed; however, a saturation of data was expected and happened, before the maximum number of participants for this study were selected for the interview instrument. Interviewing participants beyond the saturation of data will yield no additional benefits for this study (Beery, 2010). Working paramedics and non-working paramedics were interviewed inconsistently, without any predefined order, and at the convenience of each participant. Saturation of data was obtained from a total of 24 participants who are divided into 11 working paramedics and 13 non-working paramedics.

The target timeframe was 50 minutes for each participant's interview, 10 minutes for member checking, and 30 minutes for follow-up interviews to review the transcripts with

participants. The review of details with participants was for clarification purposes, and no additional data were obtained. The median recorded interview session and member checking for the working paramedic (WP) group and the non-working (NP) paramedic group was 47 minutes. Additional 30 minutes were allotted for each participant, and not recorded, to review transcripts for verification of information and in which no additional data were obtained.

Themes were discovered from codewords of data that were created from the answers provided during the recorder interview sessions. Before themes were discovered, a saturation of data was achieved from 24 pre-selected participants which then provided the necessary particulars to establish codes and sub-codes. When conducting the interviews, I was careful not to influence participants' answers by asking open-ended questions. Participants were allowed to fully answer all questions without interrupting, and I followed up by asking participants to describe the reasoning for their answers that were unclear. By using a semi-structured format, I was able to probe answers to the research questions and explore responses to reveal the essence of the challenges, problems, context, and best practices in the industry of EMS.

After the 24 participants were interviewed, no additional interviews were necessary because the project had reached the point of saturation and continuing further interviews would yield no new data (Faulkner & Trotter, 2017). All participants agreed to voice recordings during their interview sessions. Interview voice recordings between the researcher and each participant were exported into NVivo. Following this process, I listened to the recordings through NVivo software, and codes were created during the review of each recording as data points from the answers given by the participants. Codewords of similar definitions were combined to reduce the number of codes. For example, some participants defined pay as hourly wages or annual wages. After this process was complete, codewords were copied into a new folder and renamed as initial

codes to retain all original codes and data. An additional new folder was created, renamed the conceptual framework, and the code was also copied into the new folder.

Codes were copied and pasted into one of two folders identified as advantages or disadvantages. Every code discovered is either an advantage contributing to the growth and improvement of EMS or a disadvantage that hinders growth and improvements in EMS. This list of advantages aligns with strengths or opportunities that promote paramedic retention and improve recruitment, while the list of disadvantages aligns with weaknesses or threats that demote paramedic retention and hinder recruitment. It is important to classify codes as either advantages or disadvantages for the themes to be discovered, defined, and aligned with corresponding research questions. The themes that aligned with the research questions were discovered and then applicable codes were merged with five corresponding themes.

After codes were created and themes were identified from the first 20 participants, which potentially yielded the saturation of data, additional folders renamed as initial codes number two and conceptual framework number two were created to identify the information provided by 20 participants plus four additional participants as a verification process to validate that data saturation had been achieved. Saturation of data was highly suspected at the point of 20 interviews being completed, codes created, and after the data were aligned with corresponding themes; however, the additional participants were sought to either reveal new data or validate that data saturation had occurred. Table 5 shows the top five themes that were discovered.

**Table 5***Five Discovered Themes*


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Themes Distributed
Factors Contributing to Paramedic Attrition in South Carolina and North Carolina.
Factors that Would Improve Paramedic Retention.
Historical Trends Predicting Future Needs.
Interventions Needed to Recruit Paramedics into the Industry.
Paramedic Attrition and its Impact on Key Performance Indicators.

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*Note.* Themes were discovered from codes that were extracted from participants' interviews.

***Interpretation of the Themes and Subthemes***

Interpretation of the themes and subthemes were formed from codes that were extracted as data from the participants' answers. For this process to instill rigor and promote validity, the research questions were designed to align with this study's conceptual framework of factors as defined under Fredrick Herzberg's Two-Factor Theory of Motivation and specific human needs and expectations that align with Abraham Maslow's Hierarchy of Needs. Although these ideologies of Herzberg and Maslow foster values and cultivate the fulfillment of needs contributing to employee satisfaction when present, employees become demotivated and unhappy in the absence of Herzberg's "hygiene or maintenance factors" (Vipperman, 2019, p. 14). The interpretation of the themes has discovered numerous weaknesses that best align with the absence of factors identified by Herzberg's second concept of "hygiene or maintenance factors" (Vipperman, 2019, p. 14). The absences of the paramedic job conditions are identified as absences of Herzberg's hygiene factors. These reported conditions, or absence of the reported conditions, contribute to paramedic attrition, paramedic shortages, and ambulance delays; thus, negatively impacting patient outcomes in the pre-hospital environment. Additionally, the

interpretation of themes has identified numerous weaknesses and threats, under the SWOT analysis, which highly suggests that the paramedic occupation is in jeopardy of extinction. SWOT analysis is a strategic tool commonly used during business brainstorming to gauge customer service and strategic planning for performance improvement (Phadermrod et al., 2019).

All interview questions were open-ended; thus, allowing and encouraging each participant to provide their perception of the EMS industry. During each interview, participants were asked clarifying and follow-up questions which provided each participant the ability to expand or clarify their answers. The interpretation of themes aligns with the research questions on pay, benefits, management, education, and opportunities. As identified, only a few participants described positive attributes leading to the discovery and interpretation of themes; however, all participants identified several negative conditions which lead to the discoveries and interpretation of themes. Interview participants described factors leading to paramedic shortages as low pay, lack of appreciation or respect, inept management, lack of advancement opportunities, and excessive ambulance calls including imprudent call abuse. The top five themes, their corresponding subthemes, and participants' quotes that were discovered during interviews are listed in Table 6.

**Table 6***Five Discovered Themes, Corresponding Subthemes, and Participants' Quotes*

Themes	Corresponding Subthemes	Participants' Quotes
Factors Contributing to Paramedic Attrition in South Carolina and North Carolina.	Low wages	<p>"I left EMS because of the low pay and having to work more than one job just to pay my bills."</p> <p>"Experienced paramedics should be paid between \$60,000 and \$70,000 annually."</p> <p>"Paramedics work more than one job just to make ends meet."</p>
	Inept management	<p>"EMS is a good-ole-boy system where people are promoted based on friendships."</p> <p>"Supervisors forget where they came from."</p>

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	“Management needs to change.”
	“People feel like a number.”
Lack of respect for paramedics among healthcare clinicians and laypersons	“Paramedics need to be equivalent to nurses.”
	“Paramedics do not have a national board promoting the profession like nursing does.”
	“The public does not respect paramedics.”
Lack of advancement opportunities in EMS	“There are no opportunities for advancement in EMS.”
	“Fire departments have career ladders when EMS does not.”
Excessive responses to address unnecessary calls: 9-1-1 abuse	“EMS call abuse is an issue, and no one is doing anything to fix the problem.”

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		<p>“People need to be educated on when to call EMS.”</p> <p>“Paramedics are overworked from high call volumes of unnecessary calls.”</p> <p>“Paramedics cannot tell someone when they do not need to go to the hospital.”</p>
Factors that Would Improve Paramedic Retention.	Higher wages are needed for the EMS industry to retain paramedics	<p>“EMS salaries need to improve to keep paramedics.”</p> <p>“If my spouse did not make good money, I would not be able to pay the bills from what I make.”</p> <p>“As a full-time paramedic, I had to live with a roommate to share the cost of rent</p>

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	and utilities because I did not make enough money to pay rent, utilities, and buy food.”
	“When I became an RN, my salary more than doubled.”
Advancement opportunities must be developed to retain paramedics	“There are no opportunities to move up in EMS.”
	“Nurses make a lot more money and they have a lot of opportunities while paramedics have a lot more responsibilities and can do more skills for less money.”
Build EMS as a respectable profession	“EMS is not respected as a professional healthcare provider. The public perceives

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	them as ‘ambulance drivers.’”
	“EMS paramedics need to be licensed like nurses.”
	“EMS needs to have similar respect as firemen.”
Develop managers and leaders from quality paramedics	“Paramedics are promoted for the wrong reasons.”
	“EMS Paramedics are not taught to be managers; they are promoted into supervisor positions with no formal training.”
Promote and support further educational opportunities for paramedics	“EMS does not encourage people to go to school.”
	“Paramedic needs to be a degree program.”

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Historical Trends	Trending rates of	“EMS is running more
Predicting Future	paramedic shortages	calls, but directors are
Needs.	and attrition will help	not working on ways to
	predict future needs	get more paramedics.”
	and help implement	“It takes EMS a long
	projects to train future	time to get to calls.”
	paramedics	
	Trending historical call	“EMS needs to look at
	volumes over time to	the increased call
	predict future	volumes and add more
	paramedic needs and	trucks to meet the
	industry growth	growing demand.”
		“It is not uncommon
		for an ambulance to
		take 15-minutes or
		longer to get to a call.
		If it took 15-minutes
		for a fire department to
		get to a call, the public
		would have an outcry.”
Interventions	Attractive wages are	“Pay will need to
Needed to Recruit	needed to recruit	increase for people to
	people who may have	

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Paramedics into the Industry.	an interest in becoming paramedics and to promote the occupation	want to become paramedics.” “If pay does not improve, ambulances will have two people who just throw patients in the back of an ambulance and take them to the hospital.”
	Recruit people who have the desire to be paramedics	“People have to want to do this job.” “Being a paramedic is a calling.”
	Opportunities for advancement are needed	“There are very limited opportunities for promotions.” “Promotions are determined by who you know.”
	Professional licensure as credentialing standard rather than certification	“Paramedics need to be licensed.”

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Attractive benefits are  
needed

“Paramedics should be  
required to have an  
associate degree.”

“Paramedics who work  
24-hour shifts followed  
by 48-hours off duty  
will work 120 hours  
every two weeks, but  
they have benefits  
equal to 40-hour work-  
week employees. Life  
insurance is based on  
an annual salary of  
2080 hours per year  
when their year pay is  
based on 3,328 hours.”

“EMS agencies work  
24-hour shifts followed  
by 48-hours off  
because these systems  
can pay paramedics  
less money per hour.”

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Paramedic Attrition and its Impact on Key Performance Indicators.	Recruit people who have a desire to help others	“People who want to do this job must have the desire to help others.”
		“You do not become a paramedic for the money.”
	EMS suffers from high turnover rates	“EMS is ranked as the second leading occupation, secondarily only to combat soldiers, that leads to PTSD and suicide.”
	High attrition contributes to a negative atmosphere leading to higher attrition	“EMS agencies that have high turnover will continue to lose good paramedics.”
	Attrition contributes to longer ambulance response times	“Systems that have a lot of turnovers do not have enough paramedics to staff

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	ambulances, so patients have to wait for ambulances to clear calls and respond from other areas”
Attrition increases the cost and time of onboarding new paramedics	“When EMS has a lot of turnovers, they have to spend more time hiring and training new paramedics which increases cost and time. This time and cost are non-productive”
Attrition hinders paramedic recruiting efforts	“Paramedics will not go to work for systems that have a lot of turnovers.”  “Systems with a lot of turnovers have a lot of problems.”

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*Note.* Themes, corresponding subthemes, and participants’ quotes were discovered during participants’ interviews.

### *Representation and Visualization of the Data*

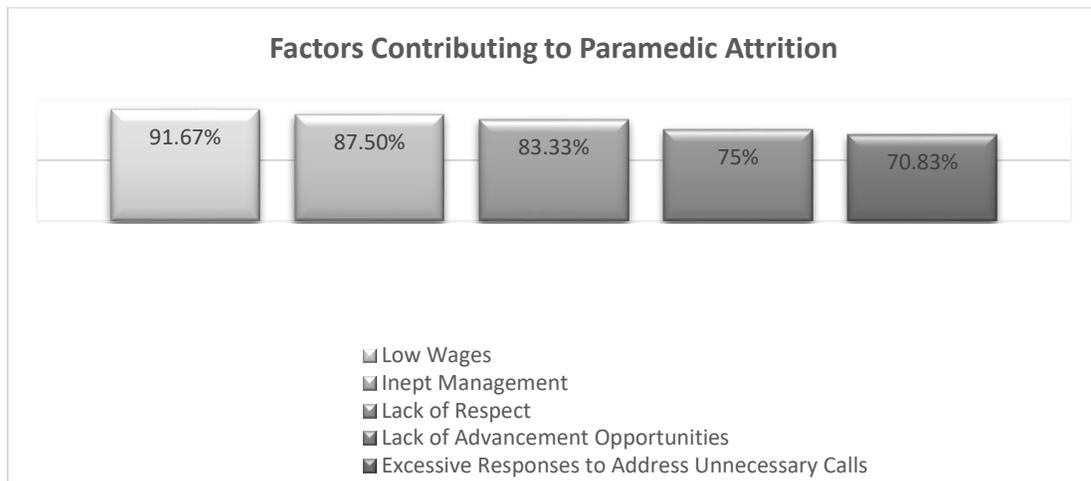
The data that were extracted from participants' interviews are displayed visibly in Figures 6 through 10. The representation and visualization of data extracted from the participants' interviews were coded and then each code was aligned with its appropriate theme or themes that were also discovered from data extracted from participants' interviews. As identified during the literature instrument of this project, the purpose of this multi-case qualitative study is to explore paramedics' preconceived motivational expectations based on the models of Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs as identified by Abraham Maslow's Hierarchy of Needs. The findings of this research project align with the ideologies of Fredrick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs. Findings from this study clearly show that employee retention is influenced by rewards, recognition, human needs, and satisfaction (Vipperman, 2019). Controversially, the lack of extrinsic factors, under Herzberg's Two Factor Theory such as low compensation, a lack of job security, substandard work status, and poor working conditions drive employees away from their organization or the industry (Herzberg, 1968).

Interview questions provided a blueprint for the discovery of themes. Five figures define the themes that align with the corresponding research questions. Figure 6 is a representation of the top five factors contributing to paramedic attrition, Figure 7 represents factors that would improve paramedic attrition if they were implemented in EMS, Figure 8 defines historical values as the best means to predicting future needs in EMS, Figure 9 depicts recommendations that will improve paramedic recruitment, Figure 10 is a representation of how EMS attritions affect EMS key performance indicators (KPI). Below are the five figures displaying data that were extracted from participants' interviews.

Figure 6 is a representation of the top five factors contributing to paramedic attrition in EMS. 100% ( $n=24$ ) of participants reported a minimum of three contributing factors to EMS paramedic attrition. Poor pay was reported by 91.67% ( $n=22$ ), inept management reported by 87.50% ( $n=21$ ), a lack of respect among healthcare workers and the public was reported by 83.33% ( $n=20$ ), a lack of advancement opportunities was reported by 75% ( $n=18$ ), and addressing unnecessary calls was reported by 70.83% ( $n=17$ ). Codes defining these same conditions were consolidated for consistency of information and to limit the number of codes.

### Figure 6

#### *Factors Contributing to EMS Paramedic Attrition*



*Note.* Factors contributing to paramedic attrition were extracted from data gathered from participants' interviews.

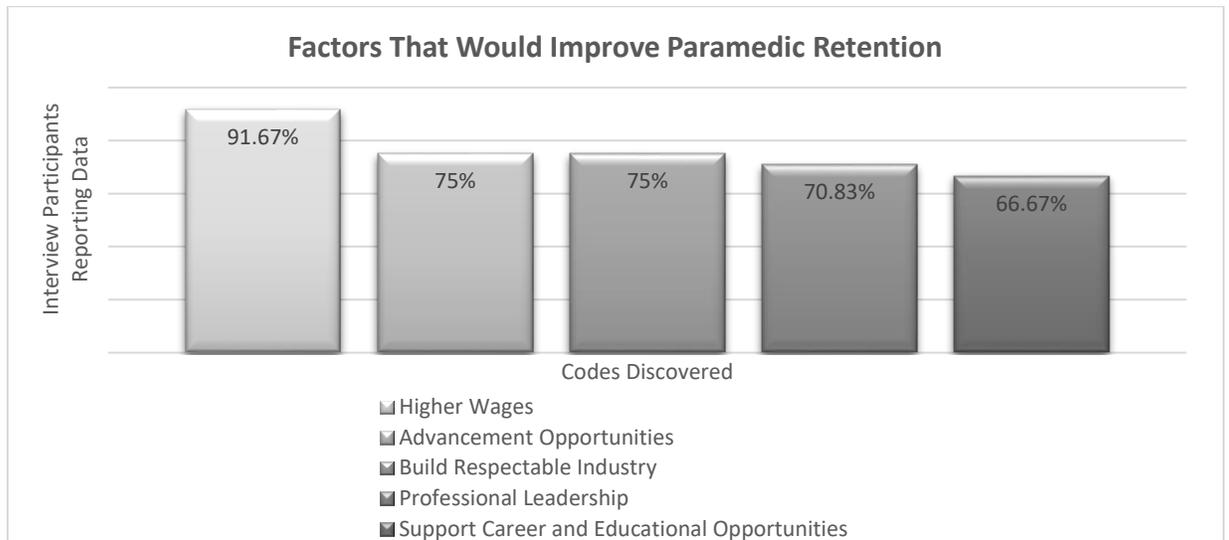
Figure 7 is a visual representation of factors that would improve paramedic retention if implemented. Like the data in Figure 6, the same 91.67% ( $n=22$ ) stated that pay must first increase before paramedic retention improves. Seventy-five percent ( $n=18$ ) felt that advancement opportunities are necessary to retain paramedics. According to these participants, there are no incentives for EMTs to take the additional and necessary steps to become credentialed as

paramedics. Findings from interviews revealed that the EMS industry customarily hires paramedics at a starting salary regardless of their experience. WP7 stated, “paramedic pay should be based on EMS experience.” NP5 stated, “I took a pay-cut when I went from Intermediate-EMT to paramedic. I would have stayed an Intermediate-EMT, but the county that I worked told me that I needed to go to paramedic school because they would pay me to go and pay for the class.” NP5 further stated, “the hour-and-half travel to paramedic class, three-days per week, and for over a year was not worth becoming a paramedic because I took a pay-cut of more than a dollar per hour.” According to NP5, the decrease in compensation was not disclosed until he was credentialed as a national registered and SC paramedic. According to several participants (NP5, NP7, NP9, NP10, NP11, NP13, WP1, and WP7), some EMTs make more money than some paramedics or the difference in pay from EMT to paramedic is minimal, and sometimes less as identified by NP5.

The top two reasons that were generated by participants in this project are the same top two reasons that were found in the works by Chapman et al. (2016) during the LEADS project between 1999 and 2008. Chapman et al. (2016) found that most paramedics were dissatisfied primarily with pay, secondarily with the lack of advancement opportunities, and thirdly with benefits. In a similar study also consisting of a survey instrument, Rivard et al. (2020) found that the top two reasons for paramedic attrition were low pay and benefits as a combined compensation package followed by the lack of advancement opportunities as the second leading contributor of paramedic attrition. NP5 stated, “EMTs should never be paid more than paramedics.” NP10 stated, “starting pay for paramedics should be at least \$60,000 per year.” Controversially, the median hourly salary for paramedics, as of May 2020, was only \$36,650 (U.S. Bureau of Labor Statistics, 2021).

**Figure 7**

*Factors That Would Improve Paramedic Retention*

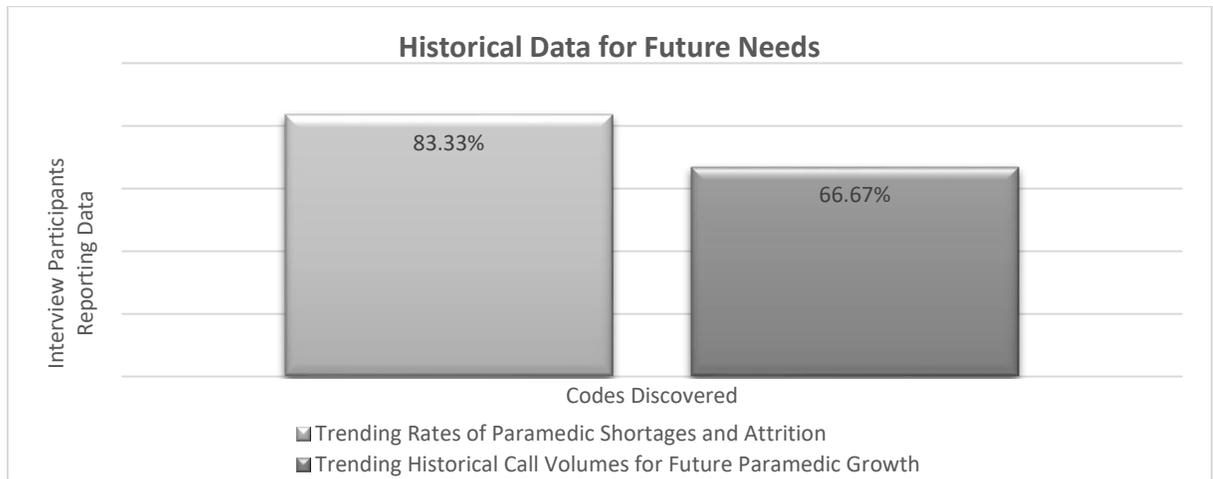


*Note.* Factors that would improve paramedic retention were extracted from data gathered from participants’ interviews.

Figure 8 is a visual representation defining that historical data must be studied to predict future needs and growth including paramedic growth needs, future ambulance needs based on historical unit utilization data, and changes in the industry over the most recent decade. As previously cited by “Zacks Investment Research” (2015), Steve Jobs once said, “people cannot connect dots looking forward, they must connect dots looking backward and trust they will connect in the future.” Figure 8 shows that 83.33% ( $n=20$ ) stated that predicting future paramedic needs and future paramedic attrition is dependent on past trends of paramedic needs and the percentage of paramedic attrition. Controversially, 66.67 ( $n=16$ ) of participants felt that the predicted growth needs of paramedics are best defined by studying the trending reports of ambulance call volumes between 2011 and 2020 to predict future annual growth needs between 2021 and 2030.

**Figure 8**

*Historical Data for Future Needs*



*Note.* Historical data to define future needs were extracted from data gathered from participants’ interviews.

Figure 9 depicts interventions needed to recruit inspiring paramedics. Like the findings in Figures 6 and 7, the same participants stated that pay must increase to attract new paramedics. 91.67% ( $n=22$ ) stated that if paramedic wages do not improve, the younger generations will pursue career paths offering attractive salaries. These participants felt that the upcoming generations will not have the same values of love for the industry or the gratification in helping others that are values of previous generations. These findings are consistent with motivators defined under Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs identified under Abraham Maslow’s Hierarchy of Needs.

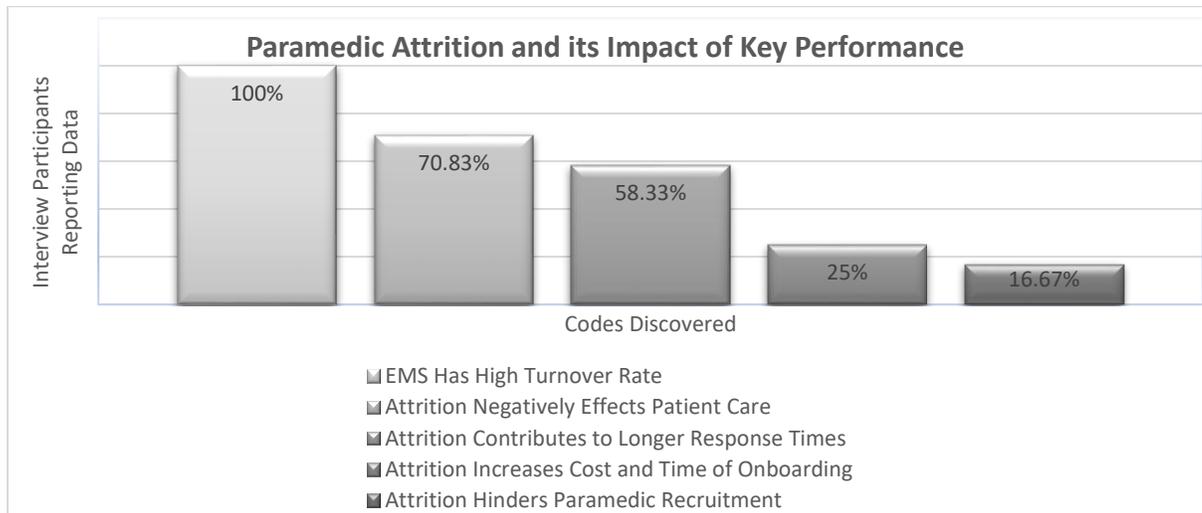
**Figure 9**

*Interventions Needed to Recruit Inspiring Paramedics*



*Note.* Interventions needed to recruit inspiring paramedics were extracted from data gathered from participants’ interviews.

Figure 10 is a visual representation of how paramedic attrition impacts EMS KPIs. One hundred percent ( $n=24$ ) of the participants felt that EMS overall is suffering from high turnover rates. 100% ( $n=11$ ) of the full-time paramedics stated that their EMS agencies “definitely” have high turnover rates. WP10 stated that his previous EMS agency has a business model to continuously recruit new paramedics, by offering bonuses, to fill open positions that are frequently vacated by paramedics who resign after an average tenure of only 3 to 5 years of service. WP10 further stated that his previous EMS employer hires paramedics with expectations that each newly onboarded paramedic will be replaced within 5 years. WP11, who is a paramedic and manager, stated that the average lifespan of paramedics is 5 years. This participant feels that EMS managers anticipate replacing their paramedic staff in 5 years.

**Figure 10***Paramedic Attrition and its Impact on Key Performance Indicators*

*Note.* Paramedic attrition and its impact on key performance indicators were extracted from data gathered from participants' interviews.

### ***Relationship of the Findings***

The relationship of findings in this study was discovered and is being presented through three separate research structures. Primarily, the literature instrument describes problems leading to the increasing EMS paramedic shortages and their effects on patient care in the pre-hospital environment. The depth and breadth of information on the issues in the EMS industry, in general, have been cited by numerous authors (Alexander et al., 2009; Baier et al., 2018, Blau et al., 2016; Watanabe et al., 2019). Secondly, the interview instrument of this study adds to the body of knowledge of the cited works and identifies further problems through its semi-structured interview format. A semi-structured interview is a process where the interviewer does not follow a formalized set of questions to encourage two-way communication “to obtain rich and direct information” (Li et al., 2019, p. 2). Thirdly, archival data will add further details which substantiate the cited literature and the data that were extracted from the participants' interviews.

Through a process of triangulation, the three separate research structures promote reliability and validity in this research project.

### **The Research Questions**

Research questions were designed as open-ended to encourage participants to provide answers in their own words. Participants were provided with opportunities to talk openly and freely about situations that they encountered during their experiences as full-time paramedics. Some paramedics did not answer specific questions when their answers directed the interview to other concerns or questions that were pertinent to the research findings. The research questions were developed as non-biased questions in search of several reasons for excessive paramedic attrition and paramedic shortages in SC and NC. Furthermore, the research questions were to determine if the reasons for the excessive attrition among EMS paramedics or paramedic shortages in the Carolinas are consistent with the reasons for the paramedic attrition and shortages in the United States which include pay and benefits (Dropkin et al., 2019) or long hours, stressful working conditions, and the lack of administrative support (Boland et al., 2019; Miller et al., 2018).

An additional category of questions was designed in a way to discover what primary factors influence paramedic tenure, or what factors contribute to paramedics wanting to stay in EMS, and have their needs met as identified by Frederick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs. While the primary category of questions was to identify factors contributing to the outflow of paramedics in EMS, additional questions will help to discover what factors will promote paramedics retention. Of the participants, 91.67% ( $n=22$ ) identified that pay must improve to retain paramedics in the industry, additional questions were to also address what factors must be studied or what

conditions must change for EMS to be salvaged and have adequate staffing of paramedics to care for the increasing demand.

Castro Lopes et al. (2017) stated that there will not be enough healthcare workers, including paramedics, to care for the increasing number of patients by the year 2030. Studying the trend of historical data between 2011 and 2020 was discovered from data received from participants as a means that will help to identify future paramedic needs and growing demands for 2021 to 2030. For this data to be collected, participants were asked the question about the value of historical data and trends of EMS as a foundation for predicting a staffing model to meet future needs. The second question in this category addressed what extent paramedic tenure influences paramedic longevity with EMS agencies in South Carolina and North Carolina. The third question in this category was to explore what extent paramedic experience, through agency longevity, influences EMS's key performance indicators.

The research questions addressed aligned with this study's conceptual framework which are the models of Frederick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs. Further review of the conceptual framework reveals that the two concepts align with a business model's Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. For example, employee satisfaction is a strength in an organization. Controversially, employees who are demotivated or unhappy within an organization align as weaknesses, opportunities, and threats. The ideologies of Fredrick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs reveal that employee retention is influenced by rewards, recognition, human needs, and satisfaction (Vipperman, 2019). Additionally, and from a business perspective, corporations' success is often defined by how well the organizational leaders identify and manage the "past, present, and future" component of

a SWOT analysis “as both an analytical tool and a heuristic device” when defining Strengths, Weaknesses, Opportunities, and Threats (Deshpande, 2019, p. 231).

In summary, findings that were identified from the data provided by participants have addressed all research questions during open-ended dialogue. The findings that were discovered from the interview instrument revealed that the leading contributor to paramedic attrition and shortages in EMS is the low pay and substandard benefits, a lack of appreciation and respect from superiors and hospital staff, inept or inefficient management, the lack of advancement opportunities, and overworked from addressing the unnecessary calls. The purpose of the research questions was to identify what primary factors influence paramedic shortages in the states of South Carolina and North Carolina and how the conditions impact patient care. The research questions were designed to discover what factors most impact EMS paramedic attrition in South Carolina and North Carolina, what interventions have the greatest impact on recruiting newly certified paramedics for EMS agencies in South Carolina and North Carolina, and what interventions influence paramedic retention among EMS agencies in South Carolina and North Carolina. The review of findings with participants confirmed that the top reasons for the paramedic shortages, paramedic attrition, and recruiting shortcomings were contributed to poor pay, the lack of appreciation or respect, management issues, lack of advancement opportunities, and burnout from addressing high volumes of unnecessary ambulance calls. Additionally, and to promote rigor in this study, it was discovered that answers provided by the participants align with the cited works of several authors (Boland et al., 2019; Dropkin et al., 2019; Miller et al., 2018) referencing the numerous struggles contributing to paramedic attrition in EMS.

### **Application to Professional Practice**

“A failure to act appropriately in a short period can have potentially fatal consequences for patients” (Szulewski et al., 2021, p. 24). Inadequate EMS paramedic staffing and increasing paramedic attrition are administrative challenges that are hindering EMS agencies from providing emergency pre-hospital care promptly (Cash et al., 2017). Findings from this study have discovered that EMS agencies must retain experienced paramedics who have developed extensive critical thinking dexterity, cognitive advertency, and psychomotor proficiency to assure that quality prehospital care is consistent and prompt. Defining the quality of professional practice in EMS is determined by the quality of patient care and ambulance response times. It was discovered during this research project that EMS agencies in SC and NC are challenged with maintaining adequate levels of paramedic staffing; therefore, most ambulance responses to emergencies in SC and NC are failing to meet EMS KPIs.

Findings from this research project show that the reasons EMS are not able to respond ambulances to prehospital emergencies quickly are contributed to the paramedic shortages because of several challenges which are low pay, inept management, lack of advancement opportunities, long hours, stressors of the job, lack of respect, and poor working conditions. The challenges affecting staffing shortages have been identified as paramedic burnout from accumulative stress because of traumatic experiences (Boland et al., 2019; Miller et al., 2018), the lack of management appreciation (Miller et al., 2018), obscure prestige, and inadequate public respect (Majchrowska et al., 2021), unpleasant work environments, the lack of promotional opportunities, inadequate benefits, and low wages (Belotto, 2017). While there are a variety of contributors to paramedic attrition, Dropkin et al. (2019) found that most paramedics in the United States resign from EMS primarily because of the low pay and high stress.

According to Dropkin et al. (2019), the misalignment of accumulative stress combined and the low pay, which are common challenges among EMS paramedics in the United States, contribute to occupational burnout and leads to the outflow of paramedics. Blau et al. (2016) discovered that the low wages contribute to the high attrition rates of these highly skilled clinicians while Jankowski (2015) blamed the turnover rate on the long hours and mandatory overtime. It was also found during this study that some paramedics leave EMS because paramedics are addressing an abundance of unnecessary responses (Tärnqvist et al., 2017). The frequent calls of unnecessary responses result in longer duty time hours with limited downtimes for rest or meals which drastically increases fatigue, creates higher stress levels, and contributes to job burnout (Tärnqvist et al., 2017). Additionally, archival data obtained from 10 years of the Longitudinal EMT Attributes and Demographics Study (LEADS) between 1999 and 2008 has shown that most paramedics were dissatisfied with pay, advancement opportunities, and benefits (Chapman et al., 2016).

Findings from this study have identified that EMS administration must address the challenges contributing to paramedic shortages by implementing strategies to reduce paramedic attrition, introducing advanced ambulance response technology to improve response times, encompassing the most advanced equipment to improve the quality of patient care, and to address new ambulance staffing models such as multi-tier ambulance responses and paramedic quick response vehicles (QRVs) that are supported by emergency medical dispatch centers. Addressing the challenges of low pay, inadequate benefits, and shortage of opportunities are internal factors that would increase paramedicine recruiting, increase paramedic retention, decrease ambulance response times, and improve patient care in the industry. The literature in this study shows that EMS will not move forward as a valid career and higher pay will not come

to fruition until the industry requires an academic degree of higher learning and EMS credentialing standards moves to a licensure model throughout the United States (Average salary by education level: Value of a college degree, 2021; Stobierski, 2020).

“Certification is an external verification of the competencies that an individual has achieved and typically involves an examination process” while “Licensure represents permission granted to an individual by the state to perform certain restricted activities” (*Education agenda for the future – EMS*, n.d.). Figure 11 (Appendix C) shows the relationship between education, certification, licensure, and credentialing. A Zen diagram where the four elements of “educated, certified, licensed by a state, and credentialed overlap” (*Education agenda for the future – EMS*, n.d., p. 12). Individuals can perform procedures that are within their scope of practice for which they have received adequate training. They hold the certification and have been licensed by their state’s governing agency and are credentialed by their medical control physician.

A significant risk to patient safety occurs when EMS personnel are placed into situations and roles for which they are not experientially or educationally prepared. It is the shared responsibility of medical oversight, clinical and administrative supervision, regulation, and quality assurance to ensure that EMS personnel are not placed in situations where they exceed the state’s scope of practice. (*Education agenda for the future – EMS*, n.d.)

### ***Improving General Business Practice***

Findings from this study have demonstrated that ambulances in SC and NC are not meeting the National Fire Protection Agency (NFPA) 1710 benchmark. The paramedic shortage has created staffing challenges that have led to ambulances closures; thus, negatively impacting prehospital patient care. EMS agencies that have adequate paramedics staffing for every ambulance are a benefit for the agencies and a blessing for the patients; however, the critical

staffing shortage of these advanced life support providers presents ongoing challenges that are contributing to increased mortality and morbidity in the pre-hospital environment. According to the NFPA 1710 standards, ambulances responding to 911 calls have a compliance key performance benchmark to arriving at the scene of emergencies within 8 minutes and 59 seconds, from the time of call received by 911, and during 90% of the responses (Ludwig, 2019; Samuels et al., 2018). Improving general business practices includes components of developing strategies to reduce paramedic attrition, recruit prospective paramedics, and quickly restructure EMS as a multi-tier response system which will provide more ambulances and improve EMS response times.

Improving general business practices in EMS will need to begin with EMS administration and EMS governing bodies taking the necessary steps to acknowledge and address the conditions that are contributing to paramedic attrition and paramedic shortages in the industry. The conditions found were low pay, inadequate benefits, inept management, shortage of opportunities, lack of respect from hospital clinical staffing and EMS management, stressful conditions contributing to occupational burnout, and the industry being labeled as an occupation of short-term employment rather than a career. These findings that contribute to paramedic attrition have ultimately led to fewer ambulances being available to respond to emergency calls. After EMS administrators acknowledge these conditions contributing to EMS paramedic shortages, solutions must be implemented to retain paramedics who are employed in EMS, and they must develop strategies to recruit new paramedics.

Findings from this project have shown that the condition of low wages, inadequate benefits, advancement opportunities, and respect among other healthcare professionals such as physicians and RNs will not change until the industry requires an academic degree of higher

learning and paramedics become licensed by their state's EMS credentialing agencies throughout the United States (*Average salary by education level: Value of a college degree, 2021*; Stobierski, 2020). Several countries are already requiring paramedics to hold Bachelor of Science degrees in paramedicine from a college or university which has been shown to improve pay, benefits, and opportunities in those countries (Dúason et al., 2021). In Austria and the neighboring Nordic countries, developments in the healthcare system and demographics have created a need for "more highly educated paramedics" (Dúason et al., 2021, p. 1). Finland has been "educating paramedics at the university level" since 1998, Norway implemented the "paramedic BS degree program in 2014," and "Denmark and Iceland are in the preparation stage for teaching paramedicine at the university level" (Dúason et al., 2021, p. 2). In the United States, Texas is the only state that recognizes paramedics as licensed clinicians; however, they are not required to have an academic degree such as an AA or BS for credentialing. Numerous EMS credentialing agencies in the United States are pushing for paramedics to become licensed as "registered health professionals and being accountable under the Health Practitioners Competence Assurance Act of 2003" (Prescott, 2019, p. 24) which will help promote the industry as a career and is expected to increase pay.

This study concludes that rebuilding the EMS industry as a respectable career path is an exterior challenge that will require state EMS legislators to change their occupation to a profession by requiring an academic degree and licensure which aligns with the nursing profession. The overall motive for addressing and strategizing a plan of action to improve paramedic retention and promote the industry as a career are expected to promote better patient care, reduce patient mortality and morbidity primarily in the pre-hospital environment and secondarily the post-emergency department admissions following EMS care, ameliorate

customer service, and help reduce stressors that are common conditions in EMS. A project to reduce stress or implement strategies for paramedics to cope with occupational stressors is a highly complex task; therefore, the benefits to cover treatment for psychological illnesses and employing counselors for contracted services must become a standard practice in the industry.

These conditions requiring improvements in EMS must also encompass patient care performance measures, customer service shortfalls, and becoming an advocate for the patients. Most experienced EMS paramedics develop extensive critical thinking dexterity, cognitive advertency, and psychomotor proficiency through a level of experience to aid in providing the best treatment and hospital destination decisions in promoting positive patient outcomes. Findings from this study have shown that EMS is failing to meet KPIs, which include delayed ambulance responses, primarily because of the shortage of paramedic staffing. Secondly, ambulances are summonsed to address unnecessary calls which increases paramedic burnout (Sumińska et al., 2020). Thirdly, there are fewer ambulances available to respond to emergency calls (Jung, 2022; Park, 2021) because of the combination of paramedic shortage and the increase in response volumes to address unnecessary calls, non-emergent transports from hospital to hospital, non-emergent transports from hospitals to residences, and interfacility transfers of critical care patients.

An example of a call in which an EMS ambulance responding to transfer a critical care patient from a lower acuity hospital to a tertiary care facility is described in Appendix D. The use of EMS ambulances for interfacility hospital transfers, non-ambulatory patient discharges, and critical care interfacility transfers in addition to their primary duties of managing 911 emergencies has shown to decrease the number of ambulances available to respond to emergency 911 calls (Kirkland et al., 2019; Miller et al., 2018). In addition, addressing these responses

increases fatigue, heightens exhaustion, and contributes to occupational burnout and attrition among staff (Kirkland et al., 2019; Miller et al., 2018). Findings from this study highly suggest that an EMS business model should separate emergency ambulance responses from interfacility responses, non-emergent ambulance transports, and critical care patient transfers. This study has identified that the best staffing matrix to address patient care and staffing challenges alike must encompass restructuring EMS as a multifaceted strategic model of tiered ambulance responses, which are basic EMT ambulances for routine interfacility non-urgent patient transports, additional basic or intermediate level ambulances to respond to 911 calls, advanced life support paramedic response ambulance or paramedic QRVs, and EMD centers that have a structured phone triage system and EMD protocols (Jung, 2022; Park, 2021).

The findings from this study have shown that not all EMS agencies are addressing interfacility transfers or patient discharge transports; however, many EMS managers are requiring paramedics to transfer critical care patients without adequate training or experience in critical care transport or the availability of advanced critical care equipment (i.e., advanced mechanical transport ventilators). Controversially, most EMS paramedics are only trained, equipped, and credentialed by local protocol to provide care and transport of patients in the pre-hospital environment. The study's findings have revealed that hospital emergency department physicians who rely on 911 paramedics for medical transports of critical patients, such as patients on mechanical ventilators, from one facility to a facility of higher care contribute to the reduction of ambulances to respond to emergencies, increase EMS shift workloads among the current staffing, contributes to paramedic burnout, and can result in peril outcomes for these patients.

Patients who are diagnosed with critical conditions require specialized care in an emergency department or critical care unit and a continuation of this care must be maintained during inter-facility critical care transports by specialty age-specific critical care transport teams. EMS agencies transporting interfacility critical care patients subject themselves and their employees to an abundance of risks including placing the paramedics' credentials in jeopardy of being suspended or revoked and the paramedics being sued. Because it is too costly for EMS agencies to include the low-volume and high-acuity specialty care ambulances and critical care paramedics within their EMS fleet of vehicles and staffing, they should have an agreement with specialty critical care transport teams that service the hospitals in their regions. Responding to the most appropriate resources for 911 calls, non-emergency transports, and critical care or specialty care transports promotes quality patient care at the most appropriate levels; thus, reducing risks and decreasing the potential for unforeseen circumstances.

Although few calls meet the critical care criteria throughout a day, these low volume and high acuity patients require the services of a specialized critical care transport team of individuals who have higher levels of training, specialized equipment, and years of age-specific experiences that are almost always separated as either adult or neo-pediatric teams. In addition to adult critical care transport, almost all pediatric hospitals have specialized neonatal and pediatric transport teams that have individuals who are highly skilled and extremely experienced in neonatal and pediatric critical care. During this study, it was discovered that a lot of EMS agencies do not allow paramedics who recognize their limitations, to refuse interfacility transports; however, specialty care transport teams have the autonomy to abort missions when situations are not favorable (e.g., unsafe conditions, patients are too unstable to move, or sustaining patients' lives during the transports are questionable). Rather than moving a critical

patient who is at risk of morbidity or mortality during conditions of ambulance transfers, some hospitals have the capability of moving specialists or surgeons to the patient. During situations where EMS paramedics identify dangers that could contribute to worsening patient outcomes during critical patient transfers, they should have the autonomy to address their concerns which aligns with the autonomy of specialty care transport teams; however, this is not an option for most EMS paramedics. WP4 stated, “EMS is more about just moving patients rather than being a patient advocate and doing what is in the best interest of the patients.” In addition, NP10 stated, “EMS is more about money than patient care.”

In synopsis, to assure that EMS can consistently maintain adequate resources to deliver quality prehospital patient care and the most appropriate resources are sought to manage interfacility critical care, age-specific patients, EMS agencies should segregate routine interfacility responses and specialty care transports from emergency 911 responses. An application that will improve general business practices is to restructure EMS as multi-tier agencies where EMTs are addressing non-urgent responses for stable prehospital patients; thus, clearing paramedics to manage emergent calls of unstable patients. Additionally, specialty care transport teams should be used for critical care transports where patients require a higher level of care beyond the 911 paramedics’ capabilities and scope of practice. Findings from this study have shown that EMS retention will likely improve if paramedics are used to managing patients who require advanced life support treatment rather than critical care or addressing non-emergency responses. They are paid fair wages and they are given opportunities to advance their education such as critical care paramedicine or nursing. An additional work not previously cited in this project revealed that paramedics have “a desire for better pay and benefits and the

decision to pursue further education” (Cash et al., 2017) which is consistent with data obtained from the review of literature and interviews.

### *Potential Application Strategies*

Potential application strategies to improve paramedic recruiting opportunities and paramedic retention in EMS have several components that must be addressed by EMS administrators. Primarily, EMS administrative staff must acknowledge the challenges contributing to the outflow of paramedics, recognize that the shortage of EMS paramedics is at critical levels, and become accountable for arguing for changes to reduce the paramedic shortages. Lewis (2021) stated, “it does no good if an EMS agency brings five paramedics in the front door when ten are walking out the back door.” EMS directors manage their agencies while their superiors or elected officials such as county council manage the business structure and provide financial resources for their county’s EMS. Whether EMS progresses or it remains status quo, at best, is dependent on county and hospital administration. Administrators and decision-makers who allow their agency to remain status quo or those accepting attrition as a practical and normal business model are contributing to the problems in EMS. Elected officials must accept their share of the responsibility for conditions leading to the EMS paramedics' shortages and make provisions to rectify the challenges or take a risk of being replaced. The primary challenge identified from this study is the low pay; however, there are other conditions leading to inferior and inadequate paramedic staffing which are inept management, limited opportunities, stressors of the job, lack of respect, poor working conditions, and physical and emotional injury (Majchrowska et al., 2021).

According to interview participant NP9, paramedics suffer from low pay, encounter numerous problems from managers, and work under the most stressful conditions of any

occupation. The suicides rate among paramedics is higher than in any other occupation (Martin et al., 2017; Vigil et al., 2019) which is mostly contributed to the stressors of the job (Boland et al., 2019; Sridhar, 2018; Tärnqvist et al., 2017). NP9, a previous EMS paramedic who currently works as an RN stated, “nursing has its share of problems and stress, but the conditions are much more tolerable when wages are much higher.” The findings from the review of literature and participants’ interviews have clearly shown that low pay is the primary reason for paramedic shortages. As addressed previously, paramedics earn 40% less than the average American worker and are reported as one of the worst-paying medical jobs in the United States (Bahler, 2018) with the median hourly salary of \$17.62, or \$36,650, as of May 2020 (U.S. Bureau of Labor Statistics, 2021). According to NP10, “well-trained paramedics should be paid between \$60,000 and \$70,000, annually.” Regarding the education component to train and recruit EMTs and paramedics for EMS, retention will continue to be an issue until pay improves. Additionally, and as a triangulation component for this study, archivable data from the SC EMS Association also has acknowledged that paramedics are quitting EMS for another occupation primarily because of the low pay and secondarily because of inept management (SCEMSA, 2021); thus, adding validity and reliability to data obtained from the review of literature and participants’ interviews.

The interview instrument of this study has discovered that the lack of qualified paramedics available to respond to emergency and non-emergency ambulance calls has reached critical levels in SC and NC. Although almost all participants described the low pay as the main reason for paramedic attrition, a project to improve the pay for paramedics throughout SC and NC is a complex process that has a lot of components and will require a significant amount of time, internal and external resources, and implementing additional requirements (e.g., academic component). Paramedic attrition is increasing, the lack of paramedic staffing available to respond

to 911 calls has reached critical levels, paramedic education programs are no longer filling classes, and there is a rapid growth of patients who need ambulances. Figure 12 (Appendix E) shows the increase in the number of 911 calls between 2015 and 2018. While the total calls have declined between 2015 and 2018, the number of 911 emergency responses has increased. Additionally, most of the ambulance standbys, mutual aid EMS assists, paramedic intercepts to aid as additional care providers, and public assistance calls are handled by 911 ambulances; thus, increasing the number of responses.

Staffing in South Carolina is concerning because of the increasing attrition and people are not seeking an occupation in EMS. According to the South Carolina EMS Association data, there are two categories of certified EMTs, advanced EMTs, and paramedics. The two categories are listed as EMS credentialed individuals who are not on an EMS roster despite retaining their certifications and those who are listed as employees or volunteers with at least one EMS agency. Figure 13 (Appendix F) represents individuals who are credentialed but not working for a licensed EMS provider. SC EMS credentialing data reveals that 10,455 certified pre-hospital clinical providers may or may not be working EMS. Of the 10,455 who maintain certification as an EMT, Advanced EMT, or paramedic, only 36.69% ( $n=3,836$ ) are credentialed paramedics. Figure 14 (Appendix G) are clinicians who are credentialed and who are currently working, either as a volunteer or an employee for a licensed EMS provider or interfacility ambulance transfer agency. South Carolina EMS credentialing data reveals that there are 8,221 certified pre-hospital clinical providers who are currently on an EMS roster. Of the 8,221 who are working as an EMT, Advanced EMT, or paramedic, only 38.55 ( $n=3,169$ ) are credentialed and currently working in some capacity, such as EMS or interfacility ambulance transport.

In addition to the stress contributed by the nature of EMS paramedic jobs, paramedics are on the frontlines treating patients who are suffering from an abundance of illnesses and diseases (Wu et al., 2020) and almost all these clinicians are working for multiple EMS agencies managing a vast array of emergencies and contagious medical conditions. According to several interview participants (NP3, NP5, NP9, NP10, WP2, WP4, WP6, and WP11), most paramedics work two, three, or four jobs just to meet their financial needs. For paramedics working for multiple EMS agencies, especially 24-hour shifts, the chance of contracting contagious diseases and other illnesses increases because of the high probability of disease exposures, physical and mental fatigue, poor diet, sleep deprivation, and long hours without rest; thus, weakening immune systems (Nabe-Nielsen et al., 2019). Nabe-Nielsen et al. (2019) found that shift work consisting of long hours, especially night shifts, contribute to dementia and increases the risk of chronic conditions including heart disease.

As previously addressed in the review of literature, paramedics are encountering a great deal of pressure and added occupational stress as staffing shortages increase from more frequent callouts because of the increase in illness among paramedics (Johnson, 2020). Paramedics are experiencing extensive acculturative stress burnout from the increased call volumes to care for the growing number of patients who are suffering from contagious illnesses and injuries among staffing; especially when EMS agencies either refuse to add additional resources and staffing or they do not have the staffing to manage the increased volume (Johnson, 2020; Wu et al., 2020). “Historically, infectious diseases have been the leading cause of human psychosomatic strain and death tolls” (Shahzad et al., 2020, p. 1). EMS workers are frequently exposed to dangerous and stressful working conditions from job-related hazards, injuries, violent patients, and challenges from uncontrolled environments (Bentley et al., 2016).

Ultimately, the U.S. population is experiencing a rapid increase in critical and chronic illnesses. The increased demand for 911 ambulances is stressing EMS agencies with the means to consistently respond to prehospital emergencies (Castro Lopes et al., 2017). Findings from this study show that the best potential application strategies to address the increasing ambulance need, promote paramedic retention, provide quicker ambulance responses, and decrease the EMS paramedic shortage is to restructure EMS from the paramedic response model to the multi-tier responses and EMD model. According to Møller et al. (2017), pre-hospital EMS responses must be restructured in SC and NC to facilitate the most appropriate 911 ambulance responses through emergency priority dispatch centers with EMD protocols. Succinctly, application strategies to leverage the findings of this study must include a broad spectrum of higher wages for paramedics and an education component to train EMTs and paramedics to fill the multitude of vacated positions in EMS. In retaining the new generation of pre-hospital clinicians, including EMTs in addition to paramedics, county and hospital administration must first recognize that EMS is in dire need of restructuring. The industry has numerous challenges that must be addressed, and low wages must be at the top of the agenda; however, higher wages do not immediately improve patient outcomes. Findings from this study reveal there are too many challenges to address and rectify simultaneously.

A review of literature and participant interviews, that will improve ambulance responses, addresses a model of two-tier or multi-tier EMS responses as a solution to restructure EMS because of the paramedic shortage. Two-tier or multi-tier EMS management structures are proposed to reach more patients in less time with the most appropriate resources. According to an EMS colleague, EMS agencies need to operate a combination of advanced life support ambulances consisting of two paramedics and basic life support ambulances consisting of two

EMTs. The reasoning is given for two-tier or multi-tier EMS is that these model decreases potential burnout among paramedics who must ride several ambulance calls, often not requiring the services of paramedics consistently.

Descriptive reasoning for a proposed model of two-tier EMS allows paramedics to rotate calls between two equally credentialed advanced providers while addressing emergent and critical calls such as cardiac arrest. The difference between two-tier and multi-tier EMS is that multi-tier agencies add advanced EMT ambulances to include intermediate-level responses where clinicians provide care between the basic EMT and paramedic levels. Park et al. (2021) found that multi-tier EMS increases out-of-cardiac arrest patient survivability and improves neurological outcomes. “Prolonged on-scene resuscitation” from multi-tier EMS response agencies improves the prehospital return of spontaneous circulation (ROSC) and increased neurological recoveries (Jung et al., 2022).

In precis, this research project proves that there are not enough paramedics and ambulances to care for the increasing number of elderly patients, the increasing number of sick people, the drastic increase in COVID-19 patients, and the high volume of illicit drug abusers just to mention a few. Although paramedics are the gold standard of EMS by providing the highest level of care possible in pre-hospital medicine, there are critical paramedic shortages nationwide and people are no longer getting into the EMS industry because of various reasons such as inadequate compensation packages, limited advancement opportunities, and the risk of contracting illnesses (Majchrowska et al., 2021). This study has found that EMS is encountering numerous challenges such as low pay, inept management, lack of respect, limited advancement opportunities, and excessive responses to address unnecessary calls. Although these five challenges are critical to the survival of the industry, patients who are in critical condition are

suffering from the challenges in the industry. Meanwhile, ambulances are understaffed because of the critical shortages of paramedics, and too many basic and advanced life support patients are waiting on advanced life support ambulances to clear from their previous calls. During this study’s review of literature, it was discovered that many patients are experiencing low-acuity conditions that could be managed by basic life support ambulances. According to Majchrowska et al. (2021), most ambulance calls require only basic life support consisting of emergency medical technicians.

**Recommendations for Further Study**

This study identified and addressed significant findings on why EMS is suffering from the lack of paramedics and how this shortage impacts EMS performance in SC and NC. The findings have provided avenues for recommendations on interventions for organizational improvements based upon the findings from this study; however, more research on EMS staffing shortages of both emergency medical technicians (EMTs) and paramedics is needed.

Additionally, recommendations for further studies are listed in Table 7.

**Table 7**

*Recommendations for Further Studies*

Recommendations for Further Studies	Why These Studies and Their Results Suggest Additional Areas of Study.
Impact of 24-hour duty shifts versus 10-hour, 12-hour, and 14-hour shifts	Fatigue, from long hours without adequate rest or downtime, is a contributing factor to medical errors in EMS (Nosker et al., 2021; Sumińska et al., 2020). EMS work schedules are primarily either 12-hour shifts or 24-hour shifts (Lindberg, 2015).
Paramedic well-being and stressors	Challenges encountered by paramedics are accumulative stressors created by the long hours and the routine poor work-life balance that is

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Multi-tier EMS of basic life support (BLS) and advanced life support (ALS) ambulances	<p>customary in the industry (Schilling et al., 2018).</p> <p>It was discovered during the literature review's discovered themes section of this project that the suicides rate among paramedics is higher than in any other occupation (Martin et al., 2017; Vigil et al., 2019).</p> <p>According to an EMS colleague, EMS agencies need to operate a combination of advanced life support ambulances consisting of two paramedics and basic life support ambulances consisting of two EMTs. The reasoning given for multi-tier EMS is that this model decreases potential burnout among paramedics who must ride several ALS calls consistently.</p>
The impact of paramedic quick response vehicles (QRVs)	<p>Because of the paramedic shortages, EMS agencies are failing to meet the public expectations for timely ambulance responses during emergencies. EMS quick response vehicles (QRVs), requiring one paramedic to rapidly respond to an emergency, in a multi-tier system is one suggestion that could reduce the amount of time between the time of onset and on-scene time of medical first response.</p>
Paramedic compensation versus the cost of living and inflation	<p>As discovered in cited work, most paramedics have received very low, if any, raises since the 2008 economic downturn (Ludwig, 2015). Low pay in the industry is contributed to the drastic increases in paramedic openings (Snyder, 2019).</p> <p>WP8 stated that most EMS paramedics must work excessive overtime or more than one job just to cover basic living expenses</p>
Impact of an academic degree as a minimal standard for paramedic credentialing	<p>These cited works have identified that higher standards, such as a paramedic BS degree or even an AAS degree, heighten recruiting opportunities for</p>

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Impact of reclassifying the occupation as a profession requiring licensure rather than a certification

Studies on recruiting, training, and retaining paramedics to include EMT and paramedic academies and onboarding procedures  
An improved process for initial credentialing and ongoing credentialing to align with the nursing credentialing process

Processes to improve paramedic student recruitment in the community college system

EMS and promote the industry as a professional career path for graduating paramedics.

Many participants stated that paramedics should be required to have an academic degree, such as an associate of arts, to promote the industry as a career; however, they also stated that this could reduce the number of paramedics in an already staff stringed occupation.

Several participants identified that paramedics need to be licensed like the nursing profession before industry growth can happen

EMS is experiencing a high outflow of EMTs and paramedics, and there is a shortage of people who are interested in pursuing the occupation.

During an assessment of the required life support certification credentials required by paramedics and registered nurses, the researcher found that paramedics and registered nurses are required to have the same credentials which consist of American Heart Association Basic Life Support and American Heart Association Advanced Life Support Certifications (National Registry of EMTs, 2021; The Joint Commission Standards Interpretation Group, 2021).

Findings during this study reveal that professional development and continuous in-service medical training, or continuing education programs, using new and advanced technology are important components of lifelong learning for EMS workers to meet the needs of the people and to improve prehospital care (EMS Agenda 2050, 2019; Hernandez et al., 2019).

Findings during this study show that there are no incentives to recruit people to become paramedics. This

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Processes and technology to improve ambulance response times

Impact of layperson first aid and CPR training as community first responders with drone automatic external defibrillators (AED)

Impact of EMS paramedics moving to lucrative paramedic jobs outside of EMS such as community paramedicine or emergency departments

study has discovered that paramedics are fleeing EMS because of problems that they can no longer tolerate, and the managers are not making changes in their structure to improve the retention and recruitment of paramedics.

Findings from this study show that declining EMS key performance indicators (KPIs), such as ambulance response times and quality patient care identifiers, drastically and negatively impact morbidity and mortality in the pre-hospital environment.

This project has identified that sudden cardiac arrest is almost always fatal without immediate lifesaving interventions (American Heart Association, 2020) including early bystander CPR and immediate defibrillation when applicable (Panchal et al., 2019). Despite bystander and fire department first responder CPR, “rates of return of spontaneous circulation (ROSC) and survival with minimal neurologic impairment remain low” (Patel et al., 2016, p. 359). To save valuable time from the onset of an emergency until care arrives, it is predicted that U.S. EMS agencies in the future will be deploying unmanned aerial vehicles (DRONES) to deliver AEDs to “registered community medical volunteers” (p. 5) who are notified of nearby emergencies (“EMS Agenda 2050,” 2019).

During this study, it was found that some paramedics leave their employers to work as paramedics in non-EMS industries such as community paramedicine or emergency department paramedic positions for higher wages, better benefits, and consistent shift times.

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*Note.* Recommendations for further studies to improve the overall emergency medical services industry by decreasing ambulance response times and improving overall patient care, and why these studies and their results suggest additional areas of study.

Without additional studies and strategic planning to implement goals for improvements in EMS to retain staffing and improve patient care, based on several findings during this study, EMS agencies will continue to suffer from paramedic staffing shortages and will not be able to provide quality patient care promptly.

### **Reflections**

During the closure of the interviews, participants were asked for their overall impression of the EMS industry. WP8 stated, “EMS is in desperate need of an overhaul.” In reflecting on data provided by other participants during the interviews when they were asked questions on their overall impression of EMS, 20.83% ( $n=5$ ) stated that EMS lacks respect from healthcare professionals such as physicians and RNs, the public’s perception, and EMS administration. Moreover, 16.67% ( $n=4$ ) participants stated, “EMS is one of the most needed professions.” EMS in the United States responds to an estimated 28 million calls annually and provides care to 8% of the U.S. population (Cash et al., 2017). The demand for the EMS workforce, including EMTs and paramedics, is expected to increase by 24%; however, more than 50% of EMS agencies in the United States are suffering from critical staffing issues (Cash et al., 2017). This study has discovered that paramedics are fleeing EMS because of problems that they can no longer tolerate, and the managers are not making changes in their structure to improve the retention and recruitment of paramedics. The top reasons for paramedic attrition include low pay, poor management, long hours, stressors of the job, lack of respect, and poor working conditions. While some paramedics often leave the industry for other non-clinical opportunities outside

EMS, others leave their employer to work as paramedics in non-EMS industries such as community paramedicine or emergency department paramedic positions.

The reflections fortify that the problems contributing to paramedic attrition and paramedic shortages in the EMS industry are conditions that are defined by Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs that are listed in Abraham Maslow's Hierarchy of Needs. As defined earlier in this writing, paramedics voluntarily terminate EMS jobs mostly because of the lack of Herzberg's extrinsic factors (Peterson, 2019; Vipperman, 2019). In addition, this study has identified numerous psychological challenges contributing to paramedic attrition which are accumulative stress from psychological trauma, emotional distress, mental anguish, and physical exhaustion. Fatigue and accumulative stress lead to paramedic burnout which results in higher attrition (Miller et al., 2018). Sumińska et al. (2020) found that extensive hours of shift work, which is "an intrinsic part of rescue service operation," leads to cumulative health problems, causes chronic fatigue, contributes to medical errors and other mistakes, and is nonproductive (p. 686). "Despite the high-stress levels, paramedics seem to ignore or even negate the stress" that leads to "stress-related diseases" (Peifer et al., 2021, p. 792). Moreover, fatigue from long hours without adequate rest or downtime is a contributing factor to medical errors in EMS (Nosker et al., 2021; Sumińska et al., 2020).

Shown in Figure 15 (Appendix H), the overall median EMS experience in 2020 was 3.9 years (interquartile range 2.9-9), and nearly three-quarters (72%) of EMS providers maintained their certification for less than 8 years. There were 11,197 (47.3%) EMS providers who were currently certified and 12,483 (52.7%) whose certification expired. The median EMS experience among those who were currently certified was 4.1 years (interquartile range 2.2-9.5) compared to 3.9 years (interquartile range 3-8.7) among those whose certification expired ( $p>0.05$ ). The

median age of those who were currently certified was 36 (interquartile range 29-46) compared to the median age of 35 (interquartile range 29-44) at the time of expiration among those whose certification expired ( $p>0.05$ ).

As previously addressed in this writing, EMS is one of the worst-paying medical jobs in the United States (Bahler, 2018). Table 8 (Appendix H) is visual respiration showing a variety of medical occupations and professions, their corresponding entry-level education, and the 2020 median annual pay comparison for each occupation and profession (U.S. Board of Labor, 2021). The 2020 median annual pay for occupations requiring a high school diploma or equivalent was \$32,756, a postsecondary nondegree award which includes paramedic credentialing was \$40,349, an associate degree which includes registered nursing was \$66,294, a bachelor's degree was \$56,275, a master's degree was \$92,618.33, and doctoral or professional degree was \$110,885. Statistically, if paramedic credentialing required an associate degree, the annual salary is predicted to increase an additional 21.31% and if the paramedic credentialing required a bachelor's degree, the annual income is predicted to increase an additional 45.18% beyond associate degree requirements as discovered from the archivable data obtained from Northeast University (Stobierski, 2020). People who obtain an Associate degree are estimated to earn an additional \$7,300 more in comparison to their peers who have a high school diploma; however, those who advance to a bachelor's degree from an associate degree are estimated to make an additional \$18,772 annually (Stobierski, 2020). If paramedic credentialing were to require a bachelor's degree, compensation would be more aligned with nursing salaries as discovered from 2020 archivable data on medical occupations and professions which was extracted from the U.S. Board of Labor as cited by a Northern University (2020).

In reflecting on the reasons paramedics are quitting EMS and its impact on patient care in the pre-hospital environment; this research identifies numerous challenges that must be addressed and rectified to promote paramedic retention in EMS and improve pre-hospital care. Findings from the literature and the interviews have clearly shown that EMS is experiencing high paramedic attrition and paramedic shortages. One hundred percent ( $n=24$ ) of the participants interviewed stated that EMS is suffering from excessive paramedic attrition. Moreover, almost 75% of the EMS agencies in SC and NC are experiencing paramedic shortages (Osby, 2019). Although Osby (2019) identified there is a critical shortage of EMS paramedics primarily because of the high paramedic attrition in SC and NC, there are numerous authors (Boland et al., 2019; Dropkin et al., 2019; Miller et al., 2018) who have referenced a vast array of challenges contributing to the high EMS paramedic attrition and staffing shortages across the United States. The top reasons for paramedic attrition include low pay, inept management, long hours, stressors of the job, lack of respect, and poor working conditions (Majchrowska et al., 2021) contributing to occupational burnout, and the industry being labeled as an occupation of short-term employment rather than a career (Miller et al., 2018; Sridhar, 2018).

In reflecting on the challenges of compensation and opportunities, the findings from this study show that EMS managers must address the challenges and review opportunities for improvement. Findings from this study suggest that an associate degree, at minimum, will need to be required to promote the industry as a profession, implement more advancement opportunities, and increase EMS paramedic wages. As previously described, EMS paramedics' earnings are inferior to other similar healthcare jobs in the United States (Bahler, 2018). Another challenge reported by participants, and that must be rectified, is that the industry is not respected by other health workers. EMS paramedics' contribution to the wellbeing and overall health of

communities are too often taken for granted and “are arguable ‘the forgotten profession’ within the healthcare system” (Lawn et al., 2020, p. 2). Findings from this study clearly show that paramedic salaries need to improve, the lack of respect in the community and among the healthcare industry must improve, and EMS must move from an occupation to a profession requiring licensure and fostering a career of opportunities.

Paramedics are quitting EMS to pursue other opportunities because of various challenges in the industry. “A total of 32,114 nationally-certified EMS professionals responded to the full electronic questionnaire invitation (response rate = 10.4%). There were 1,248 (3.9%) respondents who indicated they had left the industry and were not currently working in EMS” (SC EMS Association, 2021, p. 30). According to the data, most paramedics left EMS for a “desire for better pay and benefits” (SC EMS Association, 2021, p. 28). Figure 16 (Appendix J) shows the percentage of working EMS paramedics nationwide who identified the top nine challenges contributing to their resignation from EMS nationwide.

EMS paramedics are quitting the industry at alarming rates due to occupational burnout, the risk of contracting COVID-19, career opportunities outside EMS, and other factors (SC EMS Association, 2021). Figure 17 (Figure K) shows the factors contributing to the reasons for the excessive paramedic staffing shortages as defined from archival data recorded by the SC EMS Association. NP7 stated, “It is getting to a point where ambulances will be staffed by two people who just drive patients to the hospital instead of paramedics taking care of patients during transport to the hospital.” NP7 further stated, “this is how we started. Two people would go out in a hearse, put the patient in the back, both attendants would crawl up front, and they would just drive the patient to the hospital.” Previously works in this project have described the first ambulances as hearses. One may ask if the future of EMS, as identified by the “EMS Agenda

2050” (2019), predicts the progression of advanced life support that can only be provided by paramedics or if the future of EMS will progress back to the past as defined under historical trends. NP7 stated, “we either step up to be competitive with pay among other healthcare clinicians or we are going to go backward.”

### ***Personal and Professional Growth***

Belotto (2017) found that high-performing emergency medical technicians continue their education to become paramedics because they have the desire to gain more knowledge and perform advanced skills. During the interview instrument, it was discovered that many paramedics choose EMS paramedicine as an occupation because they had the desire to advance their cognitive knowledge and psychomotor skill to better serve their patients. According to Mulholland et al. (2020), paramedic emergency medicine includes specialized trauma care, administering medications, performing advanced airway measures, and cardiac monitoring including both 4-lead cardiac monitoring and 12-lead electrocardiogram (ECG). Paramedics have advanced life support training, and they perform directly under the direction of their agency’s medical control physician through a set of protocols (Holmberg et al., 2017; “National Registry of EMTs,” 2020).

EMTs are trained to perform basic life support measures such as basic patient assessment, hemorrhage control, splinting, and CPR (“National Registry of EMTs,” 2020). There are more advanced knowledge and skills needed to become certified at the higher paramedic level in comparison to the EMT level (Belotto, 2017); however, Rivard et al. (2020) found there are very limited personal and professional growth opportunities in EMS, which is one of the many reasons paramedics choose to leave the occupation. During the interview instrument, it was

found that the industry of emergency medical services does not encourage or promote academic education to further the professional growth of paramedics.

In addition to the personal and professional growth of academia and advancement opportunities, finding from this study has shown that a lot of EMS managers were promoted for unethical reasons. According to several interview participants (NP7, NP11, NP12, & WP11), EMS managers are notorious for promoting paramedics into leadership positions because of friendships and without any prior training or academic degree requirements in management, business, or leadership. During the interview instrument, as identified by NP7, NP11, NP12, and WP11, EMS leaders are famous for promoting their cronies into management positions under “The Peter Principle” which was introduced by Lawrence J. Peter in 1969 (Brennan, 2020, p. 595; Thompson, 2020, p. 596). Lawrence J. Peter labeled this concept “a satirical commentary on the seemingly dysfunctional reasons people are promoted” (Benson et al., 2019, p. 2090). Figure 18 (Appendix L) is a pie chart showing that most managers make errors and manage poorly because they receive limited management training.

According to the writings by Peter and Hull (1969), people in a hierarchy are promoted to their levels of incompetence. Managers who promote paramedic into leadership positions without requiring formalized training in leadership or formalized academia in management and business contributes to an increase in incompetent managers (Harrison, 2019). Incompetent, inefficient, and ineffective managers are often unaware of their faults and misfortunes (McRaney, 2012), and these managers cannot be convinced of their poor performance (Scott, 2019). An allegory presented by Scott (2019) stated that parents refuse to believe they have ugly babies. This research project contributes to my personal and professional growth by raising the awareness level of the numerous EMS challenges contributing to the paramedic shortages which

were identified to be low pay (Blair et al., 2016), lack of advancement opportunities (Chapman et al., 2016; Rivard et al., 2020), and occupational burnout from the imprudent call abuse or addressing unnecessary responses (Boland et al., 2019; Miller et al., 2018; Tärnqvist et al., 2017) contributes to the excessive paramedic shortages in the EMS industry.

To fulfill the personal and professional growth component of this my career in EMS, there are several components with the first being the completion and publication of this research project. The researcher of this study has been blessed by a long and prosperous career of over 35 years in EMS and over 31 years as a paramedic, including 911 and specialty care. Additional credentials include nationally registered paramedic over 30 years, South Carolina certified paramedic, North Carolina certified paramedic, EMS shift manager, critical care paramedic (CCEMT-P), pediatric neonatal critical care transport paramedic(PNCCT), certified flight paramedic (FP-C), paramedic educator, critical care paramedic educator, medical simulation lab instructor with a medical university and two flight teams, EMS education program director at the community college level, NBA court paramedic for Charlotte Hornets home basketball games, American Heart Association program director, and numerous EMS instructor credentials. As one of the final opportunities to inspire personal and professional growth, this research will be seeking opportunities in EMS consulting. Personal and professional growth will include joining the SC EMS Association and the National Association of EMTs to promote and conduct research on improvements for EMS. Additionally, I had the forethought to author a book on business leadership styles and management concepts to help develop and promote paramedics to become great leaders. EMS managers receive very little training when they are promoted into leadership positions.

***Biblical Perspective***

A common person providing care to strangers can easily be traced to Biblical times. In The Parable of the Good Samaritan, Jesus teaches:

A man was going down from Jerusalem to Jericho when he was attacked by robbers. They stripped him of his clothes, beat him, and went away, leaving him half dead. A priest happened to be going down the same road, and when he saw the man, he passed by on the other side. So too, a Levite, when he came to the place and saw him, passed by on the other side. But a Samaritan, as he traveled, came where the man was; and when he saw him, he took pity on him. He went to him and bandaged his wounds, pouring on oil and wine. Then he put the man on his donkey, brought him to an inn, and took care of him. The next day he took out two denarii and gave them to the innkeeper. 'Look after him,' he said, 'and when I return, I will reimburse you for any extra expense you may have.' (Luke 10:30-35)

To the believer, people are placed in the lives of their neighbors during specific times for specific reasons. In the Parable of the Good Samaritan, God chose the good Samaritan to provide care to a stranger who was attacked, robbed, and injured. People are chosen to take care of others. Although one may wonder why the priest and the Levite passed by the stranger; however, a Samaritan who was a common soul, was the person who provided the care. Similarly, physicians and registered nurses are skilled to provide care to sick and wounded patients inside the hospital; however, common paramedics who are less credentialed in comparison to licensed professionals are the sole providers who can deliver the best care under their credentialing agencies, including advanced pre-hospital care and transport of patients to appropriate facilities.

Matthew 22:14 (American Standard Version) teaches, “For many are called, but few chosen.” Laypeople often wonder how paramedics can perform their jobs because of their accumulative stress and traumatic experiences. Paramedics respond to emergency calls to care for patients and attempt to provide comfort to their families, who are experiencing the worse day of their life. They respond to routine patients who call daily, and some call 9-1-1 for an ambulance several times within 24 hours. Many of these patients do not require any services of a paramedic beyond ambulance transport to an ED for an examination, and often for benign or chronic conditions that could be evaluated in a physician’s office or urgent care facility at most. For those with a non-critical or low-acuity emergency, most can be adequately managed by EMTs. The calls in which paramedics are requested include a variety of situations ranging from mutilated bodies to much simpler calls where someone is experiencing a minor complaint without any signs or symptoms of illness. Paramedics are responding to everything from extensive trauma to illicit drug abusers to lifting an elderly person from the floor.

Moreover, paramedics respond to scenes of emergencies that would make most people nauseous either because of the scene itself, the smell of decomposition, or a combination of sight and smell. They respond to numerous unsafe scenes, unsanitary conditions, suicide threats, chronic alcoholism, drug abuse, and other conditions beyond most laypeople’s imagination, and they consistently care for patients throughout highly contagious pandemics. The answer to the question of why paramedics choose their occupation is misleading. To the believer, paramedics do not choose their occupation, they are chosen into the profession by God for specific purposes. Scripture affirms two forms of human purpose which are described to be the general purposefulness of the life of humanity and one’s purpose in life (*What does the Bible say about life purpose?* n.d.).

Paramedics sometimes become callas while others build a shield to manage their emotions. Some turn to alcohol, almost all suffer from PTSD, and the occupation leads to suicide in too many situations. As previously cited in the literature, staffing shortages from attrition, suicide, psychological disorders, and PTSD are causing great concerns worldwide (Asbury et al., 2017). Additionally, PTSD and stress created by the industry can trigger suicidal ideations (Wells, 2016). Paramedics who are believers in Christ and know that Jesus died and rose again after three days as their savior (Thessalonians 4:14) will find the strength to combat whatever the devil throws their way. According to the teachings of Philippians 4:13 (New International Version), “I can do all this through him who gives me strength.” Paramedics who seek God’s guidance for strength, wisdom, and skills to care for their patients, their families, and loved ones, as well as themselves, will be rewarded with enormous strength to overcome all obstacles. According to Isaiah 40:31 (New International Version), “but those who hope in the Lord will renew their strength. They will soar on wings like eagles; they will run and not grow weary, they will walk and not be faint.”

Theoretically and spiritually, paramedics are chosen by Him to care for their fellow souls; however, I found that God is missing in emergency medical services. Paramedics encounter numerous situations such as traumatic experiences, acute illnesses, chronic medical conditions, mental illness, or minor complaints that do not always require the services of an ambulance. The calls to which paramedics are responding are far beyond what any layperson can comprehend. Despite the numerous problems as cited by several authors (Alexander et al., 2009; Baier et al., 2018, Blau et al., 2016; Watanabe et al., 2019), none identified spiritual guidance as a remedy to combat the issues that are created from the conditions in the industry. Additionally, there was no mention of God, prayer, or faith to instill order in EMS during the interview instrument of this

study. 1 Corinthians 14:40 (American Standard Version) states, “But let all things be done decently and in order.”

In Isaiah 40:29, “He giveth power to the faint; and to him, that hath no might he increaseth strength.” Sadly, participants identified numerous weaknesses in the industry, none described strengths among managers as faithful followers of God anywhere in their leadership structure. Paramedics leaders, along with their subordinates, must find the love for God and they must show love and kindness to their fellow beings to build the profession and save the industry from ruin. According to 1 John 4:16, “And we know and have believed the love which God hath in us. God is love, and he that abideth in love abideth in God, and God abideth in him.”

### **Summary**

In summary, this project has revealed several reasons for paramedic shortages. It was discovered that most paramedics have not lost interest in working in EMS; they have lost interest in working in horrible conditions under deficient management for low wages. The top reasons for paramedic attrition include low pay, inept management, long hours, stressors of the job, lack of respect, and poor working conditions (Majchrowska et al., 2021) contributing to occupational burnout, and the industry being labeled as an occupation of short-term employment rather than a career (Miller et al., 2018; Sridhar, 2018). As previously addressed during the review of literature, EMS paramedics earn 40% less than what the average American worker earns, and the occupation is labeled as one of the worst-paying medical jobs in the United States (Bahler, 2018); therefore, retention of EMS staffing is concerning (Rivard et al., 2020). According to one EMS director in SC, people do not like being puked on, pooped on, bled on, spit on, or threatened: especially for \$15.00 an hour.

Paramedic students invest an average of 18 months to 4 years of specialized school to become state or nationally registered paramedics. Although the occupation does not require a formal academic degree, paramedic students who will test for their national registry certification must complete an accreditation program (Rivard et al., 2020) under the Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions, or the more common acronym of CoAEMSP (CoAEMSP, 2021). According to Frank et al. (2020), accreditation is an essential ingredient for quality healthcare educational programs globally. In addition to the minimal requirements required under CoAEMSP, some paramedic programs offer an associate of art science or a Bachelor of Science degree in emergency medical science. Although many EMS agencies prefer degrees paramedics, academic degrees from accredited colleges are above the standard requirements for the National Registry of EMTs paramedic certification. Paramedics are only required to attend paramedic programs that are CoAEMSP accredited to validate minimal training before passing a National Registry of EMTs standardized cognitive exam and psychomotor testing, only if their state requires the National Registry of EMTs certifications (“National Registry of EMTs,” 2020). According to the “National Registry of EMTs” (2020), North Carolina, New York, and Montana are the only three states that do not require national registry testing for paramedic credentialing.

The study on the excessive staffing shortages of paramedics and its impact on EMS performance in the states of SC and NC and interventions for organizational improvements identified numerous challenges that were discovered from the review of literature and participants' interviews. The findings from this study have shown the lack of qualified paramedics available to respond to emergency ambulance calls has reached critical levels in SC and NC. It was discovered that the staffing shortage of EMS paramedics is contributing to EMS'

inability to respond quickly to emergency medical calls; therefore, patient care is negatively affected. According to the National Fire Protection Agency (NFPA) 1710 standards, ambulances responding to life-threatening calls have a compliance benchmark equating their arriving at the scene of emergencies within 8 minutes and 59 seconds from the time of call received, and during 90% of the responses (Ludwig, 2019; Samuels et al., 2018). For an individual who is suffering a cardiac arrest, brain death leading to permanent death occurs within 4 to 6 minutes once their breathing and heart stop (American Heart Association, 2020; Panchal et al., 2019). For every minute that a person is in ventricular fibrillation cardiac arrest, their chance of survival decreases by 10% (Lerche, 2016). An individual who is suffering from an arterial hemorrhage will succumb to their death from hemorrhagic shock in 2 to 4 minutes without immediate and aggressive treatment to stop the bleeding (Tactical Emergency Casualty Care, 2020).

Findings from this project have concluded that ambulances are failing to reach their patients within the benchmark of 8 minutes and 59 seconds from the time of call received. Although there is a drastic pre-hospital patient population in the United States, this research project has discovered that EMS ambulances cannot meet quality benchmark response indicators mainly because of the high level of paramedic attrition and paramedic shortages. Kirkland et al. (2019) found that a significant number of patients who call EMS are low acuity patients, often with chronic non-urgent conditions, and do not require ambulances transport to an emergency department. “The low salaries of paramedics, combined with overwork, fatigue, and the stress accompanying their daily work cause more and more cases of resignation from work within the Medical Rescue Teams” (Majchrowska et al., 2021, p. 8). The reasons discovered for the outflow of EMS paramedics and EMS paramedic shortages align with Frederick Herzberg's Two-Factor Theory of Motivation and Abraham Maslow's Hierarchy of Needs (Peterson, 2019; Vipperman,

2019). Controversially, paramedic staffing deficits are most likely conditions that contributed to the lack of Herzberg's extrinsic, or hygiene, factors such as low wages and insufficient benefits (Peterson, 2019; Vipperman, 2019). According to the discoveries during literature and participants' interviews, the conditions contributing to the paramedic shortage are negatively affecting patient outcomes which are identified as increasing patient mortality and morbidity rates in the prehospital environment.

### **Summary and Study Conclusions**

In summary, imagine calling EMS for help and no one came. During the previous decades, paramedics were plentiful; however, these times have since changed. EMS administration and decision-makers who ignore the contributing factors for the excessive paramedic shortages or fail to identify solutions to combat paramedic attrition are contributors to problems in the industry. The results of this study have revealed that the number of ambulances that are left unstaffed from the paramedic shortage has reached critical levels. To evaluate EMS workforce stability, the EMS administration needs to understand the concerns that contribute to paramedic attrition (Rivard et al., 2020).

The conditions that were discovered during this study have identified that the challenges contributing to the outflow of EMS paramedics and the paramedic shortage, specifically in SC and NC, are linked to Herzberg's second concept that is identified as "hygiene or maintenance factors" (Vipperman, 2019, p. 14). Herzberg's hygiene factors are conditions of extrinsic elements of a work environment, also described as dissatisfiers, which are compensation, supervisor relationships, respect among peers, job security, work status, and working conditions (Herzberg, 1968). The discoveries from this project align with the models of Frederick Herzberg's Two-Factor Theory of Motivation and preexisting needs as identified by Abraham

Maslow's Hierarchy of Needs which is the conceptual framework of this study.

Findings from this study have revealed that the primary reasons for the paramedic shortage are contributed to the lack of extrinsic factors (Peterson, 2019) which are mainly the poor compensation and poor working conditions that are customary in the industry (Belotto, 2017). Additionally, findings that were unearthed from this study have revealed that the paramedics who terminated their position in EMS chose to leave the industry because of paramedic burnout which was contributed to some of the overall challenges which are low pay, inept management, accumulative stress, traumatic experiences, lack of advancement opportunities, long hours, stressors of the job, lack of respect, poor working conditions (Boland et al., 2019; Miller et al., 2018), the lack of management appreciation (Miller et al., 2018), obscure prestige, and inadequate public respect (Majchrowska et al., 2021). Outcomes of this research have revealed that high attrition in the industry is contributed to numerous factors that create undue stressors, lead to occupational burnout, and impede EMS' ability to provide quality patient care promptly.

An additional factor that hinders responses in addition to ambulance closures is the added and extensive workload added to the staffed EMS units. Conditions of high attrition in EMS and the shortages of paramedics have led to delays in the arrival of ambulances often because paramedics are responding from great distances. In an attempt to fill recently vacated positions, EMS agencies are attempting to hire quickly and rush EMTs and paramedics through training and new-hire onboarding. Moreover, the ramifications of the decline in paramedic staffing rushed training of virgin paramedics, and improper onboarding of newly hired and inexperienced paramedics is devastating. Throughout this study, it was revealed that most EMS agencies are failing to provide quality patient care promptly or meet the public expectations for timely

ambulance responses during emergencies, primarily because of the lack of EMS staffing.

Outcomes from this study highly suggest that salvaging EMS must encompass making provisions to move the industry from an occupation to a profession and the certification model must migrate to the licensure model. The results from the review of all discovered data have revealed that paramedic retention and successful paramedic recruiting opportunities hinges on making provisions to promote changes that will result in higher wages, better benefits, qualified managers, educational opportunities and support, advancement opportunities, employee appreciation, and autonomous work-life balance. Although EMS paramedics are identifying low wages as the leading contributor to attrition and staffing shortages, based on the data in Table 8, I opine that higher wages, better benefits, and progressing the EMS industry to a profession will not come to fruition until the industry requires an academic degree of higher learning and the standard moves to a licensure model.

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**Appendix A: Checklist of Inclusion and Exclusion Criteria for Research Participants**

Referral: Data Collecting

## Inclusion Criteria for Potential Research Participants

1. Adults  $\geq$  21 years of age Yes\_\_\_\_\_ No\_\_\_\_\_
2. Currently working as a paramedic in EMS:
  - a. Full Time Yes\_\_\_\_\_ No\_\_\_\_\_
  - b. Part Time (Information Purposes Only) Yes\_\_\_\_\_ No\_\_\_\_\_
  - c. Volunteer (Information Purposes Only) Yes\_\_\_\_\_ No\_\_\_\_\_
3.  $\geq$  3 years full-time EMS experience as a paramedic Yes\_\_\_\_\_ No\_\_\_\_\_

-OR-

4. Working in the EMS profession in a capacity other than a paramedic with  $\geq$  3 years as a nationally registered paramedic, South Carolina paramedic, or North Carolina paramedic (ex. EMS director, operations manager, shift supervisor, EMS chief, captain, etc.)  
Yes\_\_\_\_\_ No\_\_\_\_\_
5. Former full-time EMS paramedic with  $\leq$  3 years of full-time EMS paramedic experience and has terminated employment with an South Carolina or North Carolina EMS agency within the last 10 years Yes\_\_\_\_\_ No\_\_\_\_\_

## Informational Purposes ONLY:

1. EMT Yes\_\_\_\_\_ No\_\_\_\_\_
2. Paramedic Student Yes\_\_\_\_\_ No\_\_\_\_\_

## Exclusion Criteria:

1. Never practiced in the field as a paramedic Yes\_\_\_\_\_ No\_\_\_\_\_
2. Emergency medical technicians (EMTs) or advanced EMTs Yes\_\_\_\_\_ No\_\_\_\_\_

3. Individuals who obtained a national registry or state paramedic certification and never worked full-time in EMS for a period of  $\geq 3$  years. Yes\_\_\_\_\_ No\_\_\_\_\_
4. Nationally registered or state-certified paramedics who have never practiced in the field as an EMS paramedic such as community paramedics, emergency department paramedics, private industry first response, events medicine, etc. (i.e., do not meet Inclusion Criteria 2 and 3 or one of 4 or 5). Yes\_\_\_\_\_ No\_\_\_\_\_

**Appendix B: Interview Questions**

**Referral: Data Collecting**

**Introductory Statement**

As a career EMS paramedic, critical career paramedic, paramedic educator, program director of an emergency medical science department with a college, and the status a doctoral candidate, the researcher will make the effort to establish trustworthiness with the participant through the association of the occupation.

Note: The core questions for data collecting during this study will serve as a guide to identifying paramedic deficits in EMS and its outcomes on patient care. During the data collecting phase of this study, additional questions may emerge as the interview proceeds.

**Main Interview Questions**

<p>Research Question 1.</p> <p>What primary factors influence paramedic shortages in the states of South Carolina and North Carolina?</p>	
<p>Research Question 1.a.</p> <p>What interventions would have the greatest influence on paramedic retention for EMS agencies in South Carolina and North Carolina?</p>	<p>1. Why do you continue to work in the industry?</p> <p style="text-align: center;">-or-</p> <p>1.1 Why did you work in the industry as a paramedic for _____ years before pursuing another occupation?)</p>

	<ol style="list-style-type: none"> <li>2. What were your expectations and needs from the EMS occupation before you become a paramedic?  How?</li> <li>3. Were your expectations and needs met during your first three years of service? What about now?</li> </ol>
<p>Research Question 1.b.</p> <p>What factors have the greatest impact on EMS paramedic attrition in South Carolina and North Carolina?</p>	<ol style="list-style-type: none"> <li>1. For paramedics who are planning to leave the occupation: What is the most important factor affecting your decision?  -or-</li> <li>1.1 For individuals who are no longer working as an EMS paramedic: Why did you choose to leave EMS to pursue another occupation or a change in your life?</li> <li>2. What condition made you dissatisfied with your job? Why?</li> </ol>

	<p>3. Are your job experiences the same or close to what you expected they would be after (# years of working as a full-time paramedic) in EMS? What happened along the way?</p>
<p>Research Question 1.c.</p> <p>What interventions would have the most impact on recruiting newly certified paramedics for EMS agencies in the states of South Carolina and North Carolina?</p>	<ol style="list-style-type: none"> <li>1. Why did you become a paramedic?</li> <li>2. When you first started working in EMS, why did you enjoy your job?</li> <li>3. What conditions do you feel will need to change for people to want to enter the industry of EMS and become emergency paramedics? Why?</li> </ol>
<p>Research Question 2.</p> <p>What primary factors influence paramedic tenure in South Carolina and North Carolina?</p>	
<p>Research Question 2.a.</p> <p>To what extent can historical data and trends of EMS provide a foundation for predicting a staffing model to meet future needs?</p>	<ol style="list-style-type: none"> <li>1. How did you feel about EMS when you first started working in the industry? How do you feel about EMS now?</li> <li>2. Did the alignment or the misalignment</li> </ol>

	<p>between your expectations before you entered the industry and your post-employment experiences affect you?</p> <p>How?</p> <p>3. When you started working in EMS, what factors contributed to your job satisfaction?</p> <p>4. What conditions contribute to any job dissatisfaction you may have?</p>
<p>Research Question 2.b.</p> <p>To what extent does paramedic tenure influence paramedic longevity with an EMS agency in South Carolina and North Carolina?</p>	<p>1. Do you plan to stay in EMS? Why?</p> <p>2. For individuals who stay in the EMS: What is the most important factor, or condition, leading you to your decision?</p> <p>3. How does longevity, or tenure, with an EMS agency affect employees' attitudes about staying with an EMS agency? Why?</p>
<p>Research Question 2.c.</p> <p>To what extent does paramedic experience, through tenure, influence EMS Key Performance Indicators?</p>	<p>1. Do you feel that your agency has a high turnover rate? Why?</p>

	<p>2. How does the paramedic turnover rate in your service affect Key Performance Indicators (i.e., ambulance response times, unit availability, patient care, etc.)?</p> <p>3. How does paramedic experience, through years of service with one agency, affect patient care? Why?</p>
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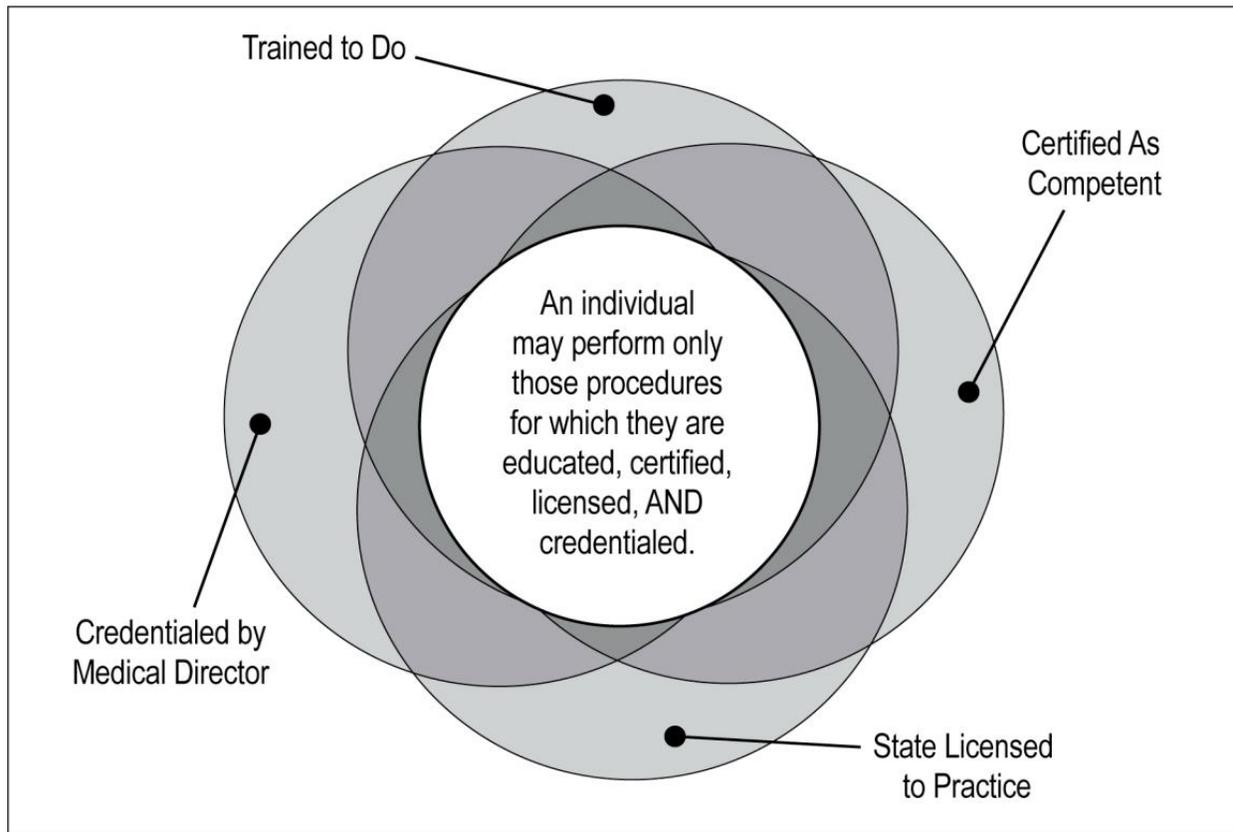
**Conclusion**

In closing, participants will be asked to form their overall impression of the EMS paramedic occupation. Additional opportunities, such as member checking, will promote additional comments for clarification of participants’ answers to the research questions. Furthermore, participants will have an opportunity to ask questions. After the data collection phase, participants will be thanked for their time and their participation. Additionally, the researcher’s contact information will be provided to participants. For this study to yield results that will increase paramedic recruitment, improve retention, and reduce attrition, ultimately improving key performance indicators in the industry, the researcher will develop an open and honest dialogue with participants through the common bond of paramedicine.

## Appendix C: Figure 11

Figure 11

*The Relationship Comparing Education, Certification, Licensure, and Credentialing*



*Note.* A Zen diagram where the four elements of “educated, certified, licensed by a state, and credentialed overlap” (*Education agenda for the future – EMS*, p. 12, n.d.).

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### **Appendix D: EMS Transferring Critical Care Patients**

An example of an unforeseen circumstance that led to the death of a two-year-old girl and paramedics being named in a lawsuit, was described by the SC paramedic who participated in beta testing for the interviews. According to this beta test subject (BT1), he and his paramedic partner responded to a hospital's emergency department (ED) where the pediatric patient was suffering from a partial airway obstruction from the sunflower seed. The ED physician attempted to remove the sunflower seed, but instead, the physician created more obstruction by pushing it further into the patient's trachea. On this horrific afternoon, the crew was dispatched to transport the patient to a specialized hospital, with pediatric emergency capabilities, by ambulance. Although the two providers were paramedics, one paramedic was in the patient compartment along with a hospital respiratory therapist, the other paramedic was the operator and driver of the ambulance.

The distance to the receiving facility was almost 30 miles away from the sending hospital. The respiratory therapist had not trained in the ambulance environment and retrieving a foreign body obstruction of this complexity was beyond the cognitive ability and skillset of the paramedic and the respiratory therapist. Additionally, the respiratory therapist had not previously trained in the unstable out-of-hospital environment alongside paramedics which presented an additional challenge to routine teamwork and understanding each clinician's level of limitations. One may ask why the ED physician could not retrieve a foreign object from a pediatric airway, especially in a controlled environment with extensive diagnostic capabilities and advanced tools. Moreover, additional questions would most likely address why this patient was placed in a heavy ambulance to travel rough roads, how an ambulance crew could extricate a foreign object from a pediatric airway if the object moved; thus, completely obstructing the patient's airway, why the

ambulance crew would agree to transport a high-risk patient suffering from a complex condition of this magnitude, and why the ambulance crew did not require a physician, with the appropriate equipment, to accompany the patient during the transport.

During the ambulance transfer, the sunflower seed moved and completely obstructed the child's airway. The paramedic who was driving pulled the ambulance onto the side of the highway to assist with patient care; however, the obstruction was too deep in the trachea and the patient died after she arrived at the receiving hospital. The outcome of this call included the tragic death of a child, the paramedics being sued personally and within the group of hospital employees who had a role in treating the patient, the emergency department physician being sued, and the sending hospital being named as a contributor to this misfortune.

It was also noted that a critical care medical helicopter flight team was at the hospital for another call and offered to transfer this patient by air, which would have been a more stable ride that would have taken less than 10-minutes from the time of liftoff. Moreover, the flight team consisted of two critical care clinicians one being a flight respiratory therapist who was also a paramedic, and the other credentialed as a licensed registered flight nurse. The helicopter did not provide transfer of this critical care pediatric patient because the sending emergency physician would not authorize the helicopter flight. BT1 stated, "I suffered psychological problems from this call because it involved the death of a child, and I had a two-year-old daughter at home who looked like her. For a long time, I could not close my eyes at night without seeing her face."

**Appendix E: Figure 12****Figure 12***Total Ambulance Calls in South Carolina Between 2015 and 2018*

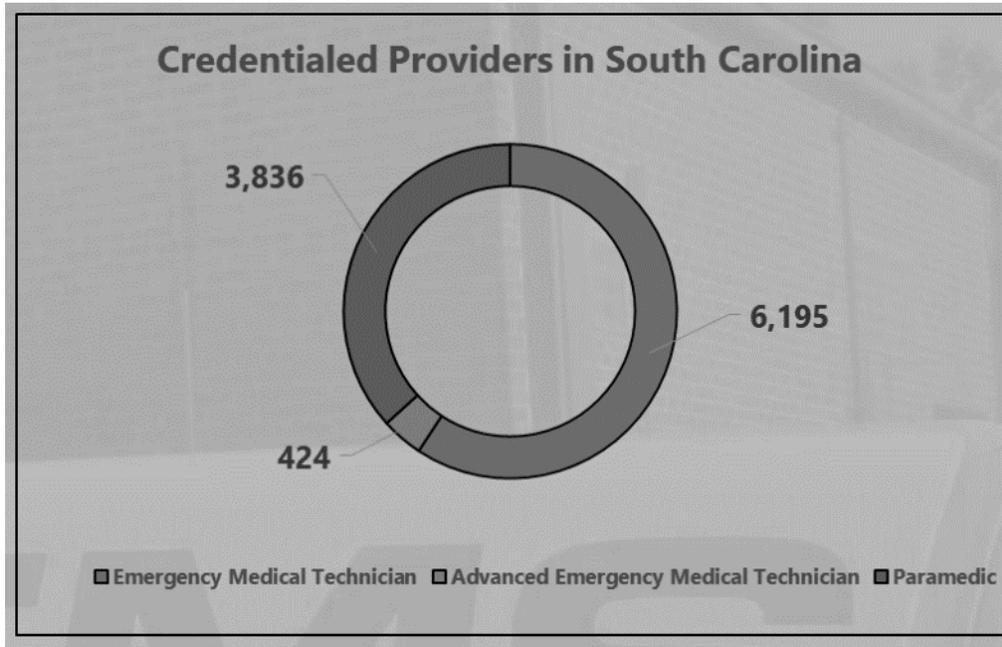
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<b>Total Calls</b>	1,354,159	1,361,958	1,349,373	1,296,277
<b>911</b>	737,792	769,290	811,437	825,885
<b>Medical Transport</b>	516,438	490,660	444,659	383,781
<b>Interfacility</b>	92,360	93,739	83,982	75,191
<b>Standby</b>	4,480	5,441	5,860	6,592
<b>Mutual Aid</b>	2,039	1,496	1,945	1,503
<b>Intercept</b>	1,050	1,332	764	767
<b>Public Assistance</b>				2,558

*Note.* Archivable data from the SC Emergency Medical Services Association displaying ambulance responses. The total call volume in South Carolina decreased between 2015 and 2018; however, 911 ambulance responses to address emergency calls increased by 11.94% from 2015 to 2018. Retrieved from SCEMSA, 2021.

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**Appendix F: Figure 13****Figure 13**

*Total Number of Certified EMS Providers in South Carolina*



*Note.* Archivable data from SC Emergency Medical Services Association, 2021.

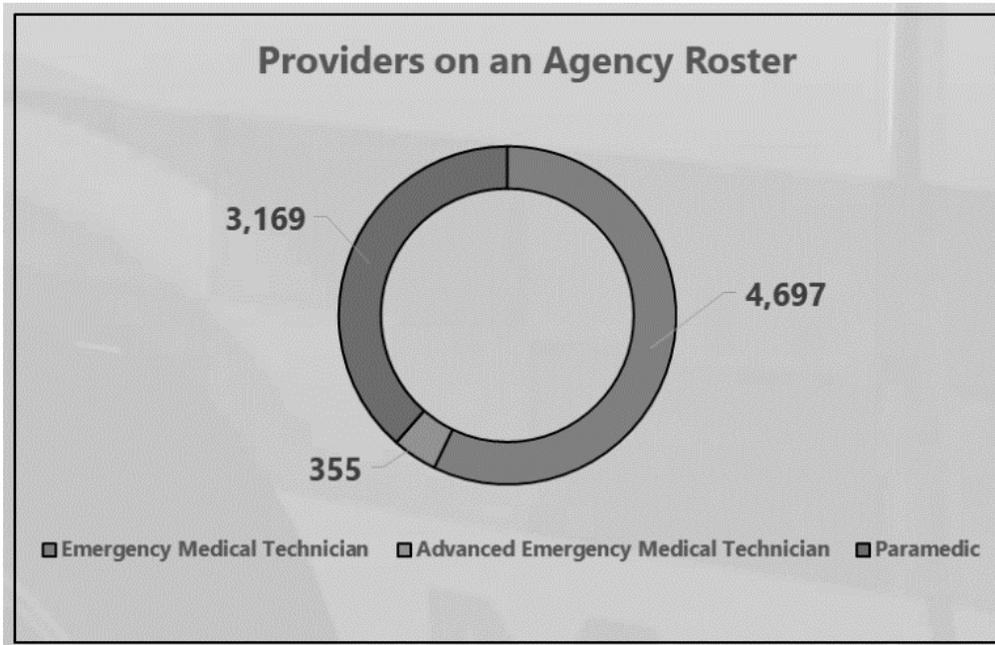
Archivable data of the total number of certified EMS providers in South Carolina. SC EMS credentialing data reveals that 10,455 certified pre-hospital clinicians are currently employed with a licensed ambulance provider and those who are not working for a South Carolina licensed ambulance provider. Of the 10,455 who maintain certification as an EMT, Advanced EMT, or paramedic, there are only 36.69% (n=3,836) are credentialed as paramedics.

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## Appendix G: Figure 14

## Figure 14

*Certified Clinicians Currently Working EMS in SC*



*Note.* Archivable data from the SC Emergency Medical Services Association, 2021.

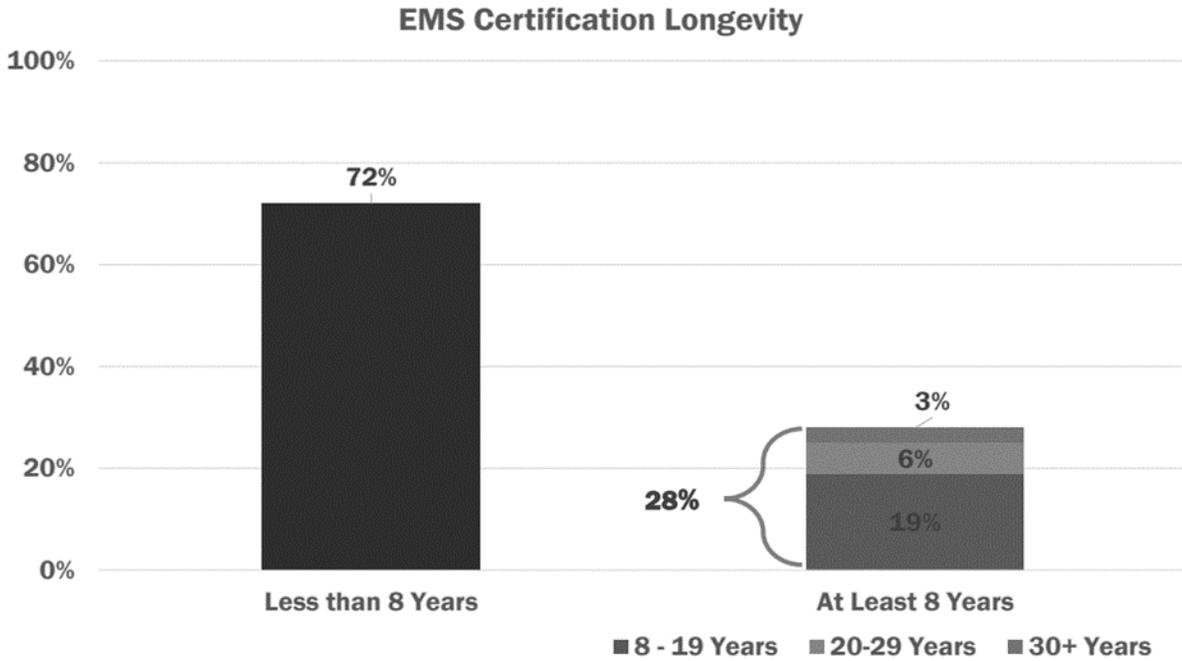
Archivable data of clinicians who are credentialed and who are currently working, either as a volunteer or an employee, for a licensed EMS provider or interfacility ambulance transfer agency. SC EMS credentialing data reveals that there are 8,221 certified pre-hospital clinical who are currently on an EMS roster. Of the 8,221 who are working as an EMT, Advanced EMT, or paramedic, there are only 38.55 (n=3,169) who are credentialed and currently working in some capacity, such as EMS or interfacility ambulance transport.

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Appendix H: Figure 15

Figure 15

*EMS Certification Longevity*



*Note.* Retrieved from Archivable data from SC Emergency Medical Services Association, 2021.

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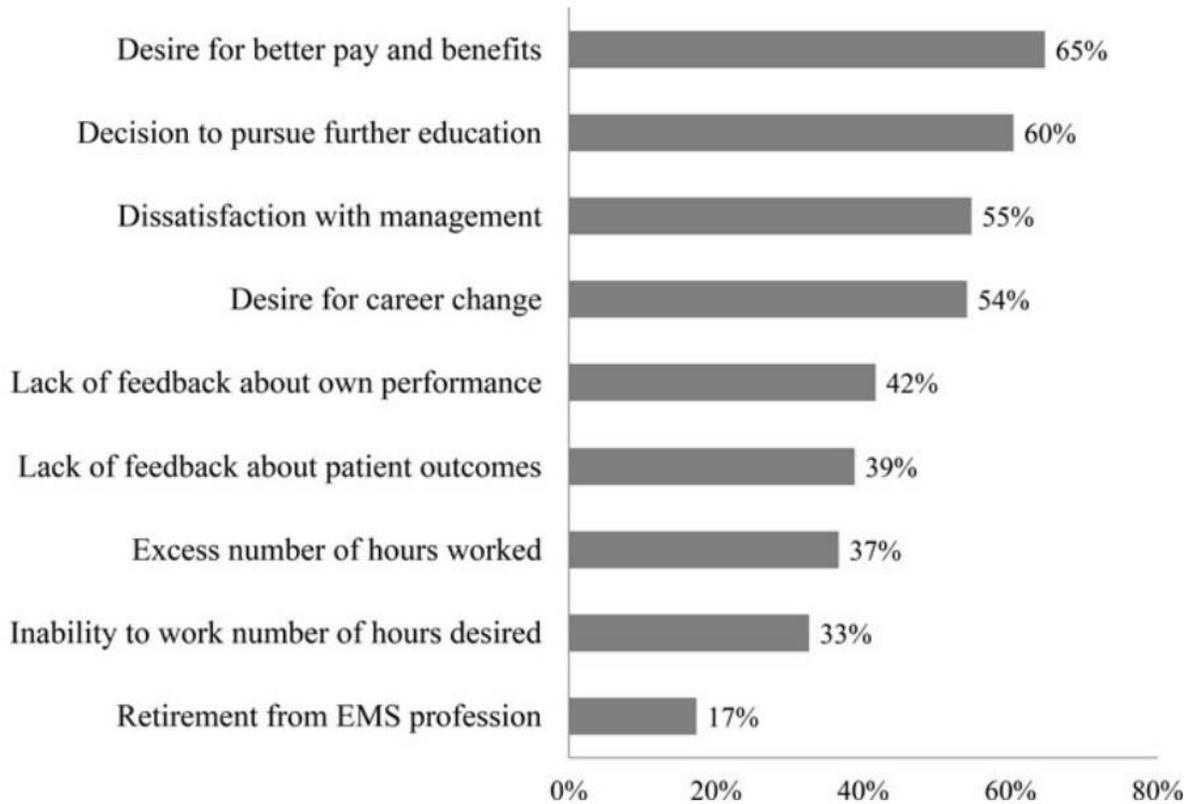
**Appendix I: Table 8****Table 8***Healthcare Occupations, Education Requirements, and Median Pay in 2020*

Occupation	Entry-Level Education	2020 Median Pay
Home Health and Personal Care Aides	High school diploma or equivalent	\$27,080.00
Opticians	High school diploma or equivalent	\$38,530.00
Pharmacy Technicians	High school diploma or equivalent	\$35,100.00
Psychiatric Technicians and Aides	High school diploma or equivalent	\$33,140.00
Veterinary Assistants and Laboratory Animal Caretakers	High school diploma or equivalent	\$29,930.00
Dental Assistants	Postsecondary nondegree award	\$41,180.00
EMTs and Paramedics	Postsecondary nondegree award	\$36,650.00
Licensed Practical and Licensed Vocational Nurses	Postsecondary nondegree award	\$48,820.00
Massage Therapists	Postsecondary nondegree award	\$43,620.00
Medical Assistants	Postsecondary nondegree award	\$35,850.00
Medical Records and Health Information Specialists	Postsecondary nondegree award	\$45,240.00
Medical Transcriptionists	Postsecondary nondegree award	\$35,270.00
Nursing Assistants and Orderlies	Postsecondary nondegree award	\$30,830.00
Phlebotomists	Postsecondary nondegree award	\$36,320.00
Surgical Technologists	Postsecondary nondegree award	\$49,710.00
Dental Hygienists	Associate's degree	\$77,090.00
Medical Sonographers and Cardiovascular Technologists and Technicians	Associate's degree	\$70,380.00
Nuclear Medicine Technologists	Associate's degree	\$79,590.00
Physical Therapist Assistants and Aides	Associate's degree	\$49,970.00
Occupational Therapy Assistants and Aides	Associate's degree	\$60,950.00
Radiation Therapists	Associate's degree	\$86,850.00
Radiologic and MRI Technologists	Associate's degree	\$63,710.00
Registered Nurses	Associate's degree	\$75,330.00
Respiratory Therapists	Associate's degree	\$62,810.00
Veterinary Technologists and Technicians	Associate's degree	\$36,260.00
Athletic Trainers	Bachelor's degree	\$49,860.00
Clinical Laboratory Technologists and Technicians	Bachelor's degree	\$54,180.00
Dietitians and Nutritionists	Bachelor's degree	\$63,090.00

Exercise Physiologists	Bachelor's degree	\$50,280.00
Occupational Health and Safety Specialists and Technicians	Bachelor's degree	\$72,530.00
Recreational Therapists	Bachelor's degree	\$47,710.00
Genetic Counselors	Master's degree	\$85,700.00
Nurse Anesthetists, Nurse Midwives, and Nurse Practitioners	Master's degree	\$117,670.00
Occupational Therapists	Master's degree	\$86,280.00
Orthotists and Prosthetists	Master's degree	\$70,190.00
Physician Assistants	Master's degree	\$115,390.00
Speech-Language Pathologists	Master's degree	\$80,480.00
Audiologists	Doctoral or professional degree	\$81,030.00
Chiropractors	Doctoral or professional degree	\$70,720.00
Dentists	Doctoral or professional degree	\$164,010.00
Optometrists	Doctoral or professional degree	\$118,050.00
Pharmacists	Doctoral or professional degree	\$128,710.00
Physical Therapists	Doctoral or professional degree	\$91,010.00
Physicians and Surgeons	Doctoral or professional degree	≥ \$208,000.00
Podiatrists	Doctoral or professional degree	\$134,300.00
Veterinarians	Doctoral or professional degree	\$99,250.00

*Note.* Medical occupations and professions, their corresponding entry-level education, and the 2020 median annual pay for each occupation and profession (*Average salary by education level: Value of a college degree, 2021*).

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**Appendix J: Figure 16****Figure 16***Reasons Paramedic Resignation from EMS in the U.S.*

*Note.* Archivable Data from SCEMSA addressing the top nine reasons paramedics resigned from EMS (SC EMS Association, 2021, p. 32).

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**Appendix K: Figure 17****Figure 17**

*Reasons for EMS Paramedic Attrition in SC.*

**WHY ARE EMS PROFESSIONALS LEAVING SC EMS AGENCIES?**

Factors contributing to the shortage include:

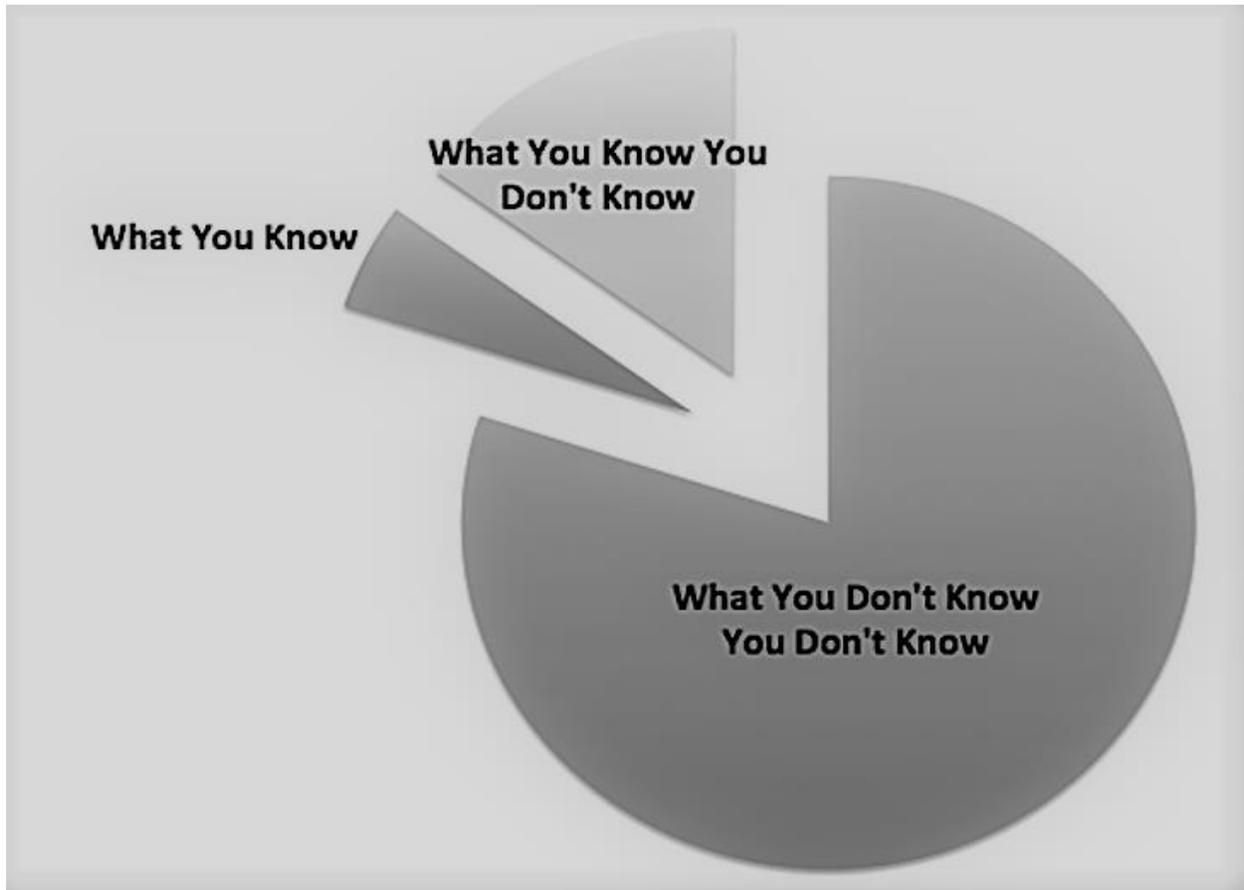
- Increased workload due to COVID-19 precautions and hospital overcrowding. This requires more staff to handle the same call volume.
- Personnel often find themselves required to isolate or quarantine due to on-the-job exposures on a frequent basis.
- High personnel COVID-19 infection rates, even among the vaccinated work force.
- Hospitals are hiring EMS personnel to help ease the nursing shortage.
- Other segments of the health care industry and industries are hiring EMS personnel. These include mobile IV companies, dialysis clinics, FEMA COVID-19 testing/vaccination clinics, and oil and gas companies.
- Personnel are leaving the field out of fear of COVID-19 exposure to themselves and their families.
- Personnel are leaving the field due to burnout related to COVID-19 and the increased workload due to staffing shortages.
- SC EMS agencies are facing a shortage of new EMS recruits entering the workforce.

*Note.* EMS paramedics are quitting the industry at alarming rates due to occupational burnout, the risk of contracting COVID-19, career opportunities outside EMS, and other factors (SC EMS Association, 2021). Factors contributing to the reasons for the excessive paramedic staffing shortages are defined from archival data recorded by the SCEMSA. “Solutions for the EMS Personnel Shortage” (SC EMS Association, 2021).

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**Appendix L: Figure 18****Figure 18**

*Pie Chart of “What Managers Do Not Know”*



*Note.* “What you Don't Know You Don't Know” equals 80%, “What you Know you Don't Know” equals 15%, and “What you Know” equals 5%.

Pie chart retrieved from, “You Are Not So Smart” by D. McRaney (2012).

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