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**ATTITUDES AND PERCEPTIONS OF EMERGENCY MEDICAL
SERVICES PROVIDERS' ROLE IN EDUCATING PATIENTS: A CROSS-
SECTIONAL SURVEY**

A Dissertation in
Workforce Education and Development

by

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ABSTRACT

This study investigates emergency medical services (EMS) providers and their attitudes about providing patient education. The role of EMS providers in healthcare continues to evolve, resulting in potential competency gaps in areas not covered in the standard EMS education curriculum. Patient education is supported in the literature to improve health literacy and clinical outcomes. To accomplish this goal, clinicians need to develop a competency around educating patients. The components of competency include skill, knowledge, behavior, and attitude. The goal of this study is to identify the relationship between EMS providers and their perceived importance of patient education and preparedness to educate patients.

EMS providers' education and experience may play a role in their perception of the importance of patient education and preparedness to educate patients. This study uses a competency model established by CanMEDS and associated controlling, explaining, listening, and influencing (CELI) tools as the conceptual framework. A quantitative study was performed by developing a cross-sectional survey to analyze the relationships between the EMS provider's education and experience with their perception of the competencies from the CELI framework. Survey participants were current and former adult EMS providers identified through a convenience sample with snowballing. A total of 370 surveys were accepted, with the majority being white males. The survey consisted of 16 practices divided into four competencies and scored using a Likert scale.

The results showed the majority of EMS providers of all certification levels perceived patient education as important. It also showed a significant difference between levels of certification in their preparedness to educate patients, and providers with more years of experience reported feeling more prepared. Other demographic factors were analyzed with only a weak relationship with feeling prepared to deliver patient education.

The study provides support for EMS administrators, educators, and training officers to investigate initiatives for developing and improving the patient education competency of their students and teams, focusing on programs for EMS providers at entry-level certification levels.

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Chapter 1

Introduction

This research explores how the EMS workforce perceives the importance of patient education practices. EMS providers are frequently involved in addressing healthcare issues caused by a patient's poor health literacy. Emergency medical responders (EMR), emergency medical technicians (EMT), and paramedics are a comparatively new type of healthcare provider, with the first paramedic pilot programs developed in the early 1970s. The first paramedics were trained in advanced procedures to provide acute care to the sick and injured to increase patient survival rates (O'Meara et al., 2015). In addition, EMS organizations outside the United States are addressing non-emergent gaps in healthcare systems, including a hybrid role called a community paramedic. The gaps are focused on a combination of a lack of primary care access and identifying chronic or high-risk patients to prevent costly inpatient readmissions or visits to the emergency department.

Patient health literacy is a significant contributor to the social determinants of health and resulting outcomes. Research reveals low patient literacy correlates to preventable readmissions and emergency department visits (Berkman et al., 2011). Increasing patient literacy can be accomplished through a physician or nurse teaching the patient about their disease process and the specific treatments or lifestyle changes that can improve outcomes. However, the time needed to perform that activity conflicts with the systemic pressures on physicians and nurses (Huang et al, 2018). These pressures include improving patient throughput, increasing financial performance, and increasing

patients' access to care. The care team shares the responsibility of improving a patient's health literacy. The EMS workforce represents a potential member of that care team to address that gap.

Statement of the Problem

Even before the COVID pandemic of 2019, health systems were under considerable stress to optimize resource utilization. Many factors contributed to that stress, including unnecessary emergency department visits and related readmissions shortly after the patient was discharged (Huang et al., 2018). Some communities looked to EMS to help manage this by adopting a relatively new role called a community paramedic, which intended to address these challenges by expanding their scope of responsibility to include non-emergent and preventative visits to high-risk patient populations (Glenn et al., 2018; Lau et al., 2018). The term community paramedic was officially created in 2005, at the founding of the International Roundtable on Community Paramedicine, to address the growing trend of expanding the scope of practice for paramedics to cope with access to care issues in primary care across the globe (Wingrove, 2011). The number of published studies on community paramedicine is limited, focusing mainly on clinical outcomes such as reducing readmission to the hospital (Schofield et al., 2020). The literature on the competency requirements of this new role has not been thoroughly identified and studied. In addition, the community paramedic's purpose, use, and certification requirements vary significantly by region and are largely unregulated and vaguely defined. The advent of the community paramedic identified a gap in EMS providers' education around the knowledge of what community

resources are available for the patient and the depth of delivering patient education (Huang et al., 2018). To bridge these gaps, some organizations developed additional training for their community paramedic program. To best fill this role, EMS providers needed to enhance a key competency focused on patient education (O'Meara et al., 2015). Early success in some programs underscored the benefit of enhancing this competency in all EMS providers (Patterson et al., 2016).

EMS providers frequently find themselves in contact with patients who are in need of basic education about their physiological, psychological, or socioeconomic challenges (Maragh-Bass et al., 2017). In addition to addressing straightforward clinical issues, EMS providers assess, identify, and address issues challenging the patient. These issues include components of social determinants of health, such as the patient's health literacy (O'Meara et al., 2015). The EMS Provider may be unable or unwilling to address these new challenges without the proper education and experience. Educating patients is a critical part of improving a patient's ability to understand and make decisions concerning their clinical care and behavior. It also helps close knowledge gaps for patients who may not be aware of resources available or how to access those resources. By educating patients about their medical condition and the resources available, the EMS provider begins to contribute to improving the patient's health literacy and address challenges identified by the social determinants of health.

Patient Health Literacy

Medical decision-making is a complex process that requires an understanding of pathologies, treatment options, and consequences (Hwang et al., 2017). Patients have varying levels of healthcare knowledge, which sometimes results in real or perceived emergencies. Although physicians are the experts and leaders of the patient's care team, access to them may be limited or unavailable. Increasing the patient's health literacy can improve their understanding and medical decision-making. Patients with lower health literacy have more emergency room visits, inpatient readmissions, higher mortality, and poor disease management (Berkman et al., 2011). For example, diabetic patients with low health literacy are more likely to be inconsistent in checking their blood sugar or modifying insulin doses. This mistake results in very low or very high blood sugar rates, leading to a medical emergency requiring rapid intervention (Ishikawa & Yano, 2011). Several factors contribute to increasing health literacy, including the internet, family, friends, and the care team consisting of physicians, nurses, and other clinically trained specialists. Out of all sources, the care team was identified by Walsh et al. (2010) as the most significant source for increasing patient health literacy for making health-related decisions. The care team is a substantial resource in developing the patient's health literacy, which improves outcomes by reducing inpatient readmissions, emergency department visits, mortality, and end-of-life planning (Berkman et al., 2011; Ladin et al., 2018).

However, when patients face uncertain medical issues or have chronic conditions and are between appointments or treatments, they may have difficulty getting an

appointment. Depending on the access issues, that timeframe may be too significant compared to the real or perceived urgency of the situation. As part of a patient's care team, the EMS provider can help increase the patient's health literacy. Several competency models on physicians and nurses may best educate patients are well-established and supported by research. The applicability of these models to EMS providers has not been studied. EMS education is traditionally taught using a model found in the career and technical education setting. Simulations and actual clinical experience are designed within the program, similar to other career and technical education programs such as nursing or medical school. However, unlike nursing or medicine, EMS providers do not have specific competencies that focus on patient education except for targeted issues such as obtaining informed consent for treatment, transport, or refusal of care. Developing patient education competence in EMS providers may require different approaches based on learning preferences. Identifying the competencies and associated learning preferences among EMS providers may help inform the profession on developing and researching the content and structure to address this patient health literacy gap.

Significance of the Study

Numerous studies have linked a patient's health literacy with social determinants of health. Social determinants of health can have a significant impact on patient outcomes (Ladin et al., 2018). The Center for Disease Control and Prevention (CDC) describe the social determinants of health as "non-medical factors that influence health outcomes. They are conditions in which people are born, grow, work, live, and age, and

the wider set of forces and systems shaping the conditions of daily life” (CDC, 2023, para. 1). Increasing a patient’s health literacy has been shown to improve outcomes in chronic conditions, including diabetes, lung disease, and heart failure, as examples (Nielson-Bohlman et al., 2004). In addition, literacy is linked to medication compliance, treatment follow-through, and healthy lifestyle changes. Financial pressures and increasing issues around access to care have contributed to a decrease in clinician availability. When combined with the additional time requirements due to documenting in an electronic medical record and administrative insurance requirements, those factors have reduced the time a clinician has available in the exam room with their patients. The healthcare industry is attempting to find systems solutions to these limitations.

Leveraging the EMS workforce is one potential solution.

Health systems, EMS administrators, and educators can use this study to evaluate the attitudes and areas for intervention with the current EMS workforce. This leads to developing programs needed to grow the patient education competency in their workforce. Additionally, EMS providers can benefit from this study by identifying gaps in the competency and addressing those gaps through their experiences. Finally, this study serves as a foundational quantitative study for researchers guiding future research on the development of training and work conditions that support the EMS provider’s patient education competency to improve patient health literacy and ultimately help set patient expectations and improve outcomes.

Purpose of the Study and Research Questions

The study's purpose is to identify what factors influence the EMS provider's perception of the importance and their preparedness to educate patients. The study focuses on comparing the results from the survey based on the patient education competency construct with the provider's demographics, including experience and education levels, as well as the provider's assessment of their work environment. The results will help educators, EMS leaders, industry groups, and future researchers to identify obstacles to consider when structuring programs focused on developing the EMS provider's patient education competency. I address four specific research questions:

Research Question 1: What is the relationship between EMS providers' certification level and their perceived importance of educating patients?

Research Question 2: What is the relationship between EMS providers' certification level and their perceived preparedness to educate patients?

Research Question 3: What is the relationship between EMS providers' years of EMS experience and their perceived importance and preparedness to educate patients?

Research Question 4: What is the relationship between the demographic and environmental factors and the EMS provider's perceived preparedness of educating patients?

Assumptions

Several assumptions were made in order to engage in this study. First, an assumption that EMS providers experienced scenarios where low patient health literacy is

evident and identifiable. Examples of this are reported in comments cited in quantitative studies that identified patient conditions that required the paramedic to intervene clinically and teach the patient why the treatment is essential.

Second, it was assumed that EMS providers believed that identifying and addressing patient health literacy issues are part of their responsibility and scope of practice. Some EMS providers may view their role as limited to clinically treating and transporting patients for emergent or immediate clinical issues. This perspective may be identified in the demographic section of the survey.

Third, that EMS providers will have an opinion on the skills, knowledge, and behaviors needed to teach patients about their healthcare issues. This assumption builds upon the first two and goes further by asking the provider to reflect on specific characteristics and experiences that inform the ratings they assign in the survey.

Fourth, it was assumed that the EMS provider responses would be grounded in experience, not based on a theoretical view of an ideal. EMS training programs do exist, but no research was identified that established the validity of the patient education competency component of the program. The purpose of this study is to identify elements for EMS educators and system leaders to develop to address patient health literacy gaps.

Finally, the researcher's background as a paramedic may have influenced assumptions but also informed them. To help combat that bias, a panel of experts was established to identify any possible bias in the survey and study results.

Survey Framework

This study explored the relationship between EMS providers and their attitudes and perceptions about delivering education to patients. A patient education competency model was designed under the CanMEDS framework to accomplish this goal.

CanMEDS was initially designed for physician training with the goal of improving patient care (Carnell et al., 2022; Wouda et al., 2011). Specific observable practices were identified as important to patient education. These practices were grouped into the four competencies of controlling, explaining, listening, and influencing (CELI). Trained evaluators use the CELI instrument to assess the clinician's patient education competency by scoring each practice on a 5-item scale. The CELI competency model instrument is used as the foundation for survey development in this study.

The survey questions are divided into three main sections, including demographics, the importance and preparedness for educating patients, and environmental factors. The first section, demographics, includes questions derived from other EMS studies (Adio et al., 2020; Bennett et al., 2017; Huang et al., 2018). The second section includes 16 practices grouped into the four competencies of controlling, explaining, listening, and influencing as defined by the CAMeds CELI framework. The third section includes questions on environmental factors that may influence the EMS provider's ability to deliver patient education, as well as two open-ended questions to allow the respondent to explain more about what specifically helped or hindered this ability.

Definitions

CELI: A framework and instrument designed for the CanMEDS framework to categorize the CELI patient education competency into the categories of controlling, explaining, listening, and intervening. Interrater reliability and content validity have been established through use with medical students, medical residents, attending physicians, nurse practitioners, and physician assistants (Wouda & van de Weil, 2015; Wouda et al., 2011).

Centers for Medicare and Medicaid Services (CMS): A center within the United States Department of Health responsible for the administration of the Medicare and state Medicaid programs.

Community paramedic (CP): Specially educated paramedics who tend to non-emergent or minor medical issues or help patients with managing chronic conditions in their residence to prevent unnecessary emergency department visits or intercede early to prevent readmissions to the hospital (Steeps et al., 2017).

Competency: the knowledge, skills, attitudes, and behaviors that a person possesses to correctly execute an item of work (Hwant et al., 2017)

Emergency Medical Responder (EMR): An entry-level prehospital care emergency responder who has completed basic life support training and passed a certification exam (Russ-Sellers & Blackwell, 2017).

Emergency Medical Service (EMS): The system in which first responders and other supporting staff care for the sick, injured, and needy (Russ-Sellers & Blackwell, 2017).

Emergency Medical Technician (EMT): An entry-level prehospital care emergency responder who has completed basic life support training and passed a certification exam (Russ-Sellers & Blackwell, 2017).

Experiential Learning Cycle (ELC): A foundational concept of the experiential learning theory, Kolb adapted a continuous learning cycle from Piaget's model of learning and cognitive development that includes a four-step progression from concrete experiences to reflective observation to abstract conceptualization to active experimentation (Kolb, 2015).

Experiential Learning Theory (ELT): A learning theory defined by Kolb, which is based on the constructivist worldviews of a combination of Lewin, Dewey, and Piaget (Kolb, 2015).

Learning Style Inventory (LSI): An inventory tool based on Kolb's ELT that categorizes learner preferences within the cycle. The preferences are divergent knowledge, assimilative knowledge, convergent knowledge, and accommodative knowledge. It's important to note that while each learner may have a tendency, that preference can change based on the experience and type of learning (Kolb, 2015).

Paramedic (EMT-P or NRP): An EMT who completes additional education and passes a rigorous certification to provide advanced life support to the sick and injured in an emergency (Steeps et al., 2017).

Patient Health Literacy: The measure of a patient's understanding of a specific or general health condition, including the anatomy and pathology, pharmacology, treatment

options, risks, and likely outcomes necessary for clinical decision-making and setting expectations of the outcome (Alpert et al., 2017).

Patient Education Competency and Patient Training Competency: The terms are used interchangeably, but ‘education’ is typically used by physicians, and ‘training’ is predominantly used in nursing literature. While no standard definition exists, it represents the clinician’s ability to provide a structured and understandable explanation for a patient’s clinical issue. It includes the ability to clearly explain the pathology and treatment, listen to the patients for verification of understanding to answer any outstanding questions, and influence and support the patient’s decision and behavior (Wouda et al., 2011).

Social determinants of health: The CDC defines this as the “non-medical factors that influence health outcomes. They are conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life” (CDC, 2023, para. 1).

Summary

The purpose of this chapter is to introduce this study examining the relationship between EMS providers’ attitudes toward the importance of patient education and their perception of their preparedness to deliver education to patients. Due to the nature of EMS training, the experiential learning model informs the design and analysis as the theoretical framework. The CELI tool provided a well-researched model to serve as the foundation for the survey instrument focused on capturing the perceptions of patient education in EMS providers.

Chapter 2

Literature Review

Introduction

The purpose of this review of the literature was divided into two parts. The first part was to identify the linkage between patient outcomes, patient health literacy, patient teaching competency, and the current gaps in the health system. The second part was to investigate the literature to determine if community paramedicine might fill that gap by assessing the researched models of delivery and documented contributions of that workforce. To fill that gap, the literature was searched for current patient education competency models used in paramedicine and the related learning preferences for each skill that make up that competency model.

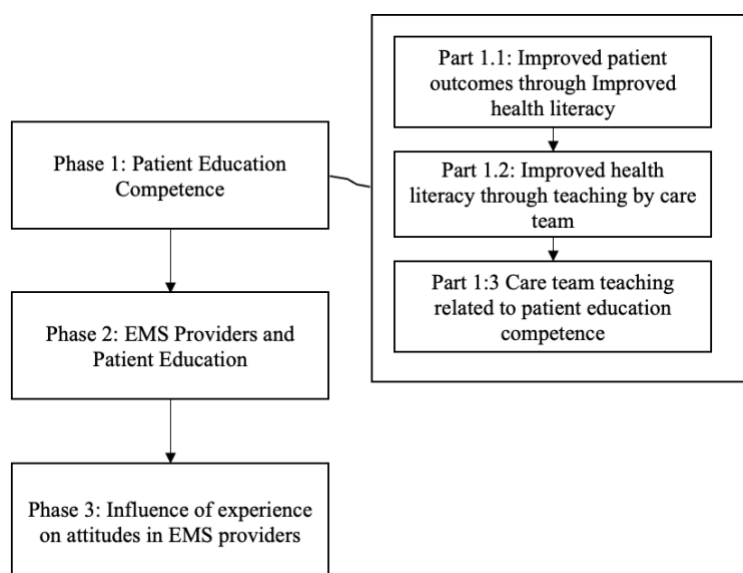
Methodology

The literature review was performed to identify the intersection of patient education, EMS providers, and experiential learning theory using Torracco's guidance on writing integrative literature reviews. This process of reviewing literature includes thorough documentation of the research methods, careful analysis of the selected literature, and syntheses resulting in new knowledge from the literature (Torraco, 2005). This research relies on a foundation of previous studies. A phased approach describes and establishes that foundation before addressing the specific gap in the literature for this study. Phase one focused on the literature on the links between improving patient outcomes to health literacy by improving clinician competence around patient education

and training competency. Phase two focused on EMS providers and competency, and phase 3 focused on the experiential learning theory and the influence of experience on competence. The overall flow is represented in Figure 1.

Figure 1

Literature Review Map



Phase 1: Patient Education Competence

The research study is predicated upon building a progressive argument, requiring the establishment of assumptions before addressing the core research topic. To accomplish this, researching the literature occurred in three progressive phases. In phase 1, the search is broken into three progressively narrow parts. This progression is divided into three parts and represented in Figure 1.

Part 1.1 begins by capturing literature that supports the linkage between patient outcomes and patient health literacy. For part 1.2, the search follows the path of linking

the patient's health literacy with the educational source, the care team. Part 1.3 further narrows the search by focusing on improving the care team's teaching by identifying a patient education competency. This research focused on the core issue of identifying how clinicians are educated to teach patients to increase literacy around health. The initial study was conducted between January 2018 and February 2018 and repeated in November of 2023 using the Pennsylvania State University (PSU) Library's database system and Google Scholar. The PSU library searches helped identify key articles, which were then analyzed using Google Scholar to determine the number of citations and a targeted, second-level search of those articles that cited the primary article. For part 1.3, the scope was narrowed further to identify records that related explicitly to the development and use of a patient education competency. This research was repeated in November 2023 to identify any additional articles published since the first review.

Phase one of the research investigated the relationships between health outcomes, patient health literacy, and the role of the clinician's competence in patient education. The investigation began with search terms "health literacy" and "patient outcomes" and was limited to peer-reviewed journals published during and after 2010. The initial search resulted in an expectedly large result of 4,044 articles. The belief that a linkage between health literacy and the impact on outcomes exists has been studied extensively; therefore, the result was not surprising. The efficacy of the targeted area of focus in this review relies on this foundational concept to be well documented. To focus the research further, in level two, the criteria "patient education" or "patient training" and "competency" were added, resulting in 488 records. Attempting to narrow the criteria to the specific topic

“patient teaching competency” or “patient education competency” resulted in one record published since 2010 and was included in the previous search.

The 488 articles were scanned for applicability to the topic and sorted by title into the categories of accept, reject, and maybe. Abstracts from articles in the “maybe” category were reviewed for applicability and categorized into accept or reject. Articles in the accept category were read, and further categorization was determined not to be applicable, resulting in 20 articles selected for this study. In reviewing these articles, additional foundational articles were identified that predated the search criteria. These articles were added as they served as the foundation for later studies used in this study. Since this phase establishes the significance of the research and not the research gap, articles were included to draw a link between patient outcomes, patient health literacy, and the clinician’s patient teaching competency.

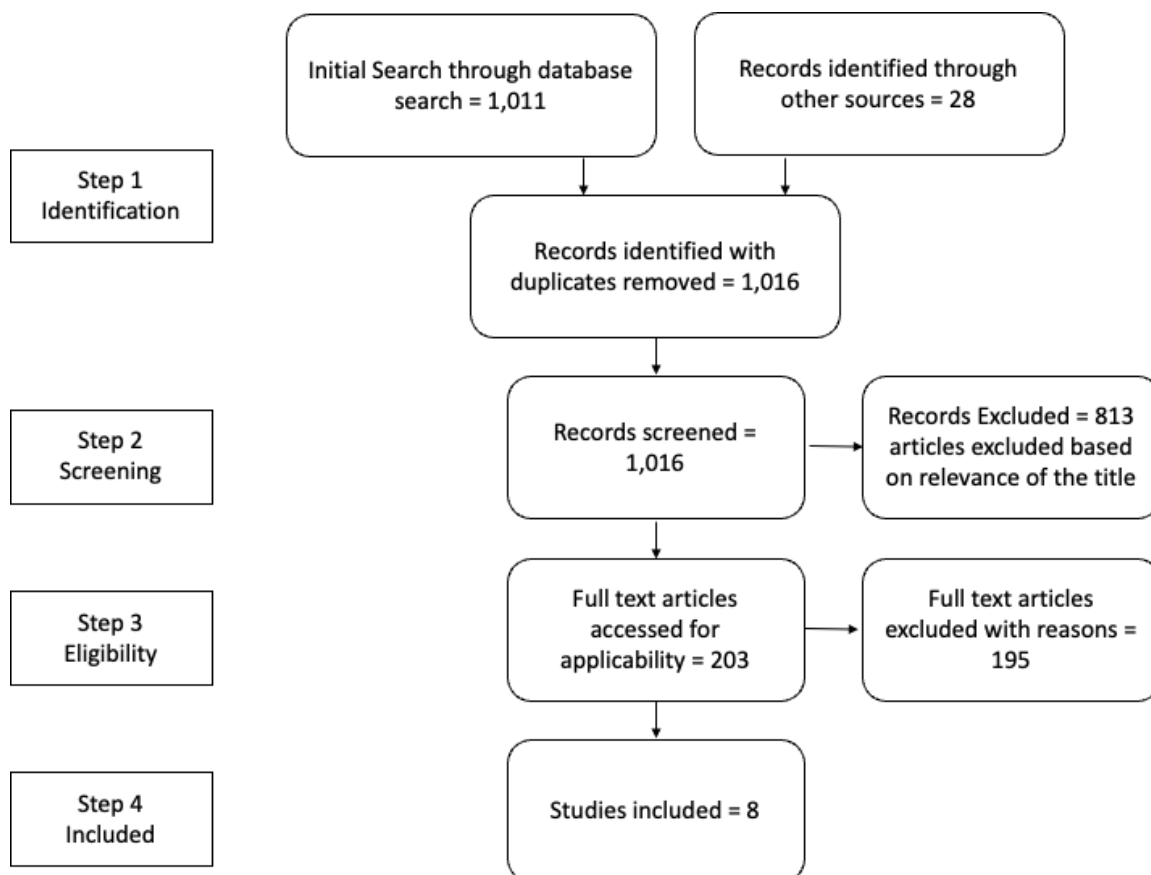
Phase 2: EMS providers and patient education

The second phase of the literature review was focused on the learning styles of EMS providers. The search was performed in September 2020 and repeated in November 2023. The Penn State University library database was searched for peer-reviewed records published after 2010. Searching for the terms of “paramedic” “emergency medical technician” “emergency medical services” and “patient education” or “patient teaching” or “health literacy” resulted in 1,011 records. The review of the literature followed the PRISMA methodology (Moher et al., 2009). These records were scanned for relevance based first on the title. They were categorized into one of the three

categories of accept, reject, or maybe. Abstracts from the “maybe” category were reviewed for placement into accept or reject. The inclusion of “emergency medical services” captured a significant number of articles focused on hospital emergency departments but did result in one article focused on the prehospital environment. Articles remaining in the maybe category were read for final determination of applicability, resulting in the selection of 8 articles for inclusion (see Figure 2).

Phase 3: The influence of experiential learning on attitudes of EMS providers

The final phase of the literature search focused on the intersection between the learning preferences of EMS providers regarding patient teaching competency and patient health literacy. EMS education is structured similarly to other STEM courses, which benefit from using an experiential learning framework (Threeton & Kim, 2021). However, the literature was limited when applied specifically to EMS education. Multiple iterations of searches were performed for peer-reviewed articles from 2010 to 2023 using the Penn State University library search engine in September 2020 and November 2023. The initial investigation of peer-reviewed articles published after 2010, including the terms “paramedic” or “emergency medical technician” and “attitudes” or “perceptions,” resulted in 7,306. Adding “health literacy” or “patient education” narrowed the results to 40 records. Upon reviewing the abstracts of each, one article from Adio et al. (2020) was identified as relevant.

Figure 2*PRISMA Statement for EMS Providers and Patient Education*

Note. Adapted from “Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement.” by D. Moher, A. Liberati, J. Tetzlaff and D. G. Altman, 2009, *Journal of Clinical Epidemiology*, 62(10), p. 1009. (<https://doi.org/10.1016/j.jclinepi.2009.06.005>). Copyright 2009 by the authors and used by permission according to the Creative Commons Attribution License.

Patient Health Literacy and Outcomes

This research relies on a foundation of previous research that established the link between patient health literacy and outcomes. The purpose of this study is not to test those findings but to represent a summary of the literature that establishes it. Significant research in the area of linking health literacy and positive patient (and family) outcomes is evident in the high number of articles identified during this research. Even when limiting the search to a subgroup of patients, “diabetes,” the number of reports linking health literacy and diabetic patient outcomes is 1,957. It seemed that diabetes was a frequent pathology studied, likely due to a large number of diabetic patients and the more objectively measurable results. For diabetes, the outcome measure (blood glucose level) is relatively straightforward, and the research reveals the specific learning objectives for better patient outcomes (Bohanny et al., 2013). Clinicians focus on teaching the patient about the importance of the timing and result of the blood glucose test. The results describe how patients must self-medicate in order to manage their diabetes (Bohanny et al., 2013). Several studies found that patients who have lower clinical health literacy require more active communication by physicians to obtain outcomes similar to a patient with high health literacy (Ishikawa & Yano, 2011; Swavely et al., 2014). For people with diabetes, lower health literacy meant more frequent visits to the emergency department, which is an undesirable outcome (Bohanny et al., 2013). This was the case in more than just diabetes. A review of 123 studies by Berkman et al. reveals that low health literacy results in poor outcomes in several pathologies, including increased inpatient hospital admissions and the use of emergency care (2011). This study also suggested that while

increased health literacy results in better clinical outcomes, assessing oral health literacy was only included in two studies, and the impact was not measurable (Berkman et al., 2011). In other words, merely communicating with patients may not be enough. When patients are in crisis, it seems they may not retain information well enough to take action. Relying on a typically brief interaction with a clinician may need to be supported with other media, such as through the internet.

Even with the questionable accuracy of the information, the internet is often used as an adjunct in improving patient health literacy (Alpert et al., 2017). However, the variability of the understandability of the content can create an obstacle. The Centers for Disease Control (CDC) developed a Clear Communication Index (CCI) to measure the effectiveness of health information contained in a portal (Alpert et al., 2017). The significance of the portal relies on the technical accuracy contrasted with the layperson comprehensibility. Therefore, when distributing information on a portal, it is not enough to simply provide the patient with access to the information. The information must be made relevant to the patient, similar to how an educator must make course content relevant to a student.

Part 1.1 Patient Health Literacy and the Patient Education Competency

Based on this literature, increasing patient health literacy in areas specific to disease appears to have a benefit in improving outcomes (Berkman et al., 2011; Bohanny et al., 2013; Ishikawa & Yano, 2011). How is that health literacy impacted? A patient or family member may affect health literacy in a number of ways, some reliable, some

questionable (Walsh et al., 2010). Sources of information that can influence the patient's health knowledge and beliefs include the internet, friends and family, television shows and commercials, movies, and sometimes, their doctor. Although little research is available on all factors that influence patient health knowledge, Walsh et al.(2010) surveyed 2,715 cancer patients to identify the top sources of information that patients use to make healthcare treatment decisions. After analyzing 1,784 responses, researchers identified eight different categories of sources. Respondents to the study identified the care team as the most consistent influence on their treatment decisions, with 86.7% identifying this source. The second highest influencer was family members at 42.7%, with the remaining six sources all below 20%. They concluded that although patients use many sources of information to make clinical treatment decisions, the clinical staff has the most significant impact on this group of patients' understanding and influence on the treatment decision chosen. In the role of educator, the clinician becomes a significantly influential participant in teaching patients about their health. While the study reported the impact, the approach, strategy, or delivery of information by the "treatment staff" was not described. There was no assessment of the structure of the interaction between the clinical team and the patient, nor was there any discussion on the teaching competency of the clinical staff. The focus was on assessing the communication between the clinician and the patient.

Communication is undeniably a key component of education, but education is far more than just talking. Communication alone is not enough to influence behavior or develop new knowledge. Career and technical education (CTE) and adult educators

develop teaching skills and strategies to maximize learning for their students (Estepp & Roberts, 2013). These researchers provide a method to enhance the comprehension and retention of information necessary to the student. The effective educator employs educational strategies when deciding how content is delivered. Experienced trainers adapt teaching to the experiences, perspectives, and knowledge of the learner, as well as “engaging in diverse training techniques” (Arghode & Wang, 2016, p. 121). Arghode and Wang (2016) then identified four traits of an engaging instructor:

1. Focus on the learner
2. Interactive training techniques
3. The educator is a content expert
4. Display energy, excitement, and passion about the subject.

Part 1.2 Patient Health Education Competency

This layer builds upon research demonstrating the significant impact clinicians have on patient health literacy, and health literacy has an impact on clinical, psychological, and financial outcomes. Researchers call for a focus on improving or developing a competency in teaching (Dandavino et al., 2007; Stull & Duvivier, 2017). In addition to competency development, researchers further identified the benefits of systematically developing and validating a competency scale to measure effectiveness (Joon Yoon et al., 2010). However, the direction of the reviewed literature revealed the preponderance of studies focused of the physician’s teaching was not the patient, but rather, the medical student. The nursing profession does have a significant focus on

patient teaching, but research shows much of that focus is on the more technical aspects of care, such as dressing changes and insulin checking (Richard et al., 2018). Dandavino et al. identify one of the key benefits in developing a teaching competency in medical students as helping them become more effective at communicating, “as teaching is an essential aspect of physician-patient interaction” (2007, p. 560). An issue that is not addressed is the variability in using teaching skills on medical students compared to patients. Medical and nursing students presumably have a foundation of knowledge, a level of learning capability, and a comparatively low level of anxiety compared to the patient population, which has variable levels of education and healthcare knowledge and is sick or in pain.

In reviewing the literature, original studies were identified that tested the connection between improving a physician’s teaching ability and better outcomes. One study compared physician faculty evaluated by their residents through a survey called a Teaching Effectiveness Score (TES) (Mourad & Redelmeier, 2006). The study assessed the TES of the physician faculty with related patient outcomes in an attempt to link physicians with a higher TES score with better results (Mourad & Redelmeier, 2006). However, the TES evaluation assessed the physician’s ability to teach and is generally used to evaluate academic physicians teaching medical students. The assumption was that academic physicians with higher TES scores are likely to be better teachers to patients. However, the results revealed no statistically significant difference in patient outcomes between physicians with higher or lower TES scores. Similarly, a study of the effectiveness of simulation-based training on improving communication between patients

and medical residents or nurse practitioners demonstrated no statistically significant improvement between clinicians who received the additional training and those who did not (Curtis et al., 2013). This might lead one to conclude that improving communication or teaching ability would have no impact on patient outcomes. However, both articles focus on an academic medical environment with patients who were in the hospital environment as opposed to a clinic or doctor's office setting.

The second study, also in an academic medical environment, did expand to include surveying not only patients but family members as well (Curtis et al., 2013). While the second study did not find a link between additional communications training and better patient understanding, it did find that the perception of patients and family members were consistent. That consistency is important when considering that patients consider advice from family members second only to information from the clinical team (Walsh et al.2010). Therefore, creating a program that enhances patient health literacy should include family members who can help support patient health literacy. Conversely, ignoring the impact of family members may lead to conflicting information between the clinical team and the family members, placing the patient in an uncomfortable position and possibly make decisions not consistent to drive to better outcomes.

In healthcare, teaching competencies typically focus on the clinical student and not the patient (Dandavino, Snell & Wiseman, 2007). Eight studies were identified that focused on the development and validity of a patient education competency model (see Figure 3). However, Wouda et al. studied one competency model that has an associated tool that was tested for interrater reliability and content validity (2011). CanMEDS has

developed the control, explain, listen, influence (CELI) tool based on a competency model that is represented by the definition of the tool's skill evaluations. The skills are grouped into four categories and have been used to evaluate residents, medical students, nurse practitioners, and physician assistants. The studies estimate the clinician's competency at a snapshot in time but have not yet been used in conjunction with patient outcomes or impact on patient health literacy.

Figure 3

Themes of the Patient Education Competency Model

Author	Article Title	Key Competency Themes
Bergh et al. (2014)	Registered nurses' perceptions of conditions for patient education – focusing on aspects of competence	Communication, patient understanding, pedagogical approach.
Forbes et al. (2018)	Identification of competencies for patient education in physiotherapy using a Delphi approach	Learning principles, listening, content, communication, feedback, barriers to learning, collaboration.
Hwang et al. (2018)	Health education and competency scale: Development and testing	Empowerment, assessment, pedagogy, motivation
Jones et al. (2011)	Maximizing your patient education skills (MPES): A multi-site evaluation of an innovative patient education skills training course for oncology health care professionals	Learning theories, communication, listening, learning needs and readiness, barriers, emotions, cultural and generational barriers.
Lin & Wang (2017)	Patient education competence scale for registered nurses in Taiwan: Scale development and psychometric validation: Patient education competence of nurses	Listening, emotion, educational methods, feedback, respect, collaboration, communication, expertise.
McManamny et al. (2020)	Paramedic involvement in health education within metropolitan, rural and remote Australia: a narrative review of the literature	Health education, health promotion, specialized knowledge: patient education
Svavarsdottir et al. (2016)	Knowledge and skills needed for patient education for individuals with coronary heart disease: The perspective of health professionals	Theoretical knowledge: Patient education Clinical knowledge: Clinical experience

Author	Article Title	Key Competency Themes
		Advanced communication skills: Communication, listening, learning needs, readiness to learn
Wouda et al. (2015)	Supervisors' and residents' patient- education competency in challenging outpatient consultations	Control of situation, conversation, rapport, emotions, listening, influencing and support

Note. The search of published research included terms for patient teaching competency and patient education competency. Studies included in Figure 3 identify the development of components for the competency.

The studies on clinician teaching of patients raise as many questions as they provide answers. The limited number of studies compared to the extensive research in education leads to questioning whether the impact is insignificant or, instead, the execution is lacking. If improved health literacy is linked with better outcomes and clinicians provide the most influence on patient decisions on treatment, how can an improvement in the teaching competency in clinicians result in no change in outcome? Are there far more factors influencing outcome than health literacy? The articles studied focus on patients in an inpatient hospital setting for better data capture. Would a study on the impact on patients in a clinic setting reveal the same result, or do those patients with higher literacy stay out of the inpatient setting? Finally, the easier outcomes to measure are “mortality rate” and “days spent in the hospital.” However, other outcomes must be considered, including clinical, psychological, and financial. For example, a cancer patient’s mortality may not be impacted by increased health literacy, but the treatment choices and quality of life may be significantly affected.

In the process of attempting to identify teaching competencies for clinicians, a theme of improved communication was discovered in several articles. One study rated

the intensity or effort required compared to the positive impact of patient communication (Levinson et al., 2010). A second researcher concluded that to make a meaningful improvement in communication, the intensity must be higher than most physician practices could support outside of a research environment (Rao et al., 2007). In many instances, additional personnel was needed to enhance communications, resulting in additional expense to the organization. This point underscores the opportunity in addition to the challenge. Enhancing patient health literacy through improved communication and education that is facilitated by an additional non-physician or non-nurse, such as a paramedic, may fill some critical gaps in the healthcare delivery system.

Although a positive impact on the patient outcome due to clinical patient education proficiency was not consistently identified, the research acknowledged limitations and other effects on the clinician's relationship to the patient. For example, in one study, it was noted that patients of the clinicians who received the communication training were slightly more depressed after the interaction (Curtis et al., 2013). It is worth considering that the depression was a result of more transparent communication and a better understanding of an unpleasant or terminal condition.

Although the literature focused on the role of the physician or nurse in impacting the patient's health literacy, one study noted that logistical and systemic challenges exist that call into question the practicality of this approach. Rao et al. (2007) indicated that while a positive impact on patient health literacy was noted, the sustainability of such a program was impractical due to the resources and time required. Other solutions must be investigated using alternate methods and personnel to meet this need.

EMS Provider Workforce

In the United States, EMS Providers are not generally licensed as independent clinicians but instead certified or registered to perform certain clinical functions under the direct authority of a medical director physician (Steeps et al., 2017). The EMS Provider is authorized to make independent clinical decisions only as permitted under precise protocols, which are ratified at the state level by board-certified emergency physicians (Bennett et al., 2017; Steeps et al., 2017). This relationship is sometimes described as an EMS provider being a physician extender, that is, extending the physician's care delivery. The premise behind the community paramedic is to increase that scope from emergency care to primary care or sub-emergency patient issues (Bennett et al., 2018). A community paramedic model was initially designed to close care gaps in rural and underserved areas by "performing medical procedures, physical/mental assessments, follow-up post-discharge, and conducting prevention and education" (Huang et al., 2018, p. 372). Unfortunately, this vocation is not consistently defined or regulated, leading to confusion about the actual purpose and level of care that can be provided. For example, the term "community paramedic" can include providers at any level of certification and is not limited to just paramedics. This role also faces opposition from other healthcare professions. The American Nurses Association delivered a position statement providing guarded support for the program, noting that an important aspect of this expansion is concretely defining the scope of practice (American Nurses Association, 2014; Eaton et al., 2018). The development of the community paramedic role is significant in this study

as the importance of the patient education competency extends beyond the education standards set by national and state certification agencies (Eaton et al., 2018).

The research on community paramedic programs primarily focuses on the outcome metrics of reducing hospital readmissions or emergency department visits (Leduc et al., 2020). The skills of the paramedic needed to be expanded to cover less acute and chronic conditions. As noted in several studies, one of the expanded roles of the community paramedic is to address patient education, which is geared to improve patient health literacy and treatment compliance (Huang et al., 2018; Rasku et al., 2019; Staple et al., 2018; Steeps et al., 2017; Williams, 2005). However, these studies only discuss that goal tangentially and do not assess, in-depth, the specific competencies required to perform that task. The need to educate the patient is discussed in relation to other expanded skills but not the focus of the study. Several studies do note that the community paramedic's ability to educate patients is an area that needs further research (Evans et al., 2013; Moule et al., 2018; Schofield et al., 2020).

Another perspective for developing this competency is determining whether EMS providers have learning style preferences in developing the skills, knowledge, and behaviors for patient education (Schofield et al., 2020). One study by Staple et al. (2017) surveyed 260 paramedics and categorized their learning styles according to Kolb's ELT, resulting in 28% identifying as assimilating, 25% diverger, 24% converger, and 23% accommodator, concluding that the population's learning style was diverse (Staple et al., 2017). They used the Kolb learning style indicator 3.1, which assessed each paramedic's overall learning style preference in reference to all continuing medical education

activities. Kolb states that learners can shift from one learning style to another based on the situation and what is being learned (Kolb, 2015). This research does not attempt to determine the paramedics' general learning preference, but rather, the specific learning styles preferred for specific tasks making up the patient education competency. Additionally, Kolb's ELT is less about categorizing learners as it is defining a process through which experiential learning occurs (Konak et al., 2013).

Theoretical Framework

The theoretical framework for this study is largely informed by this review of literature and is based on Kolb's Experiential Learning Theory (ELT) (2015). This theoretical framework is intended to explain the researcher's worldview, define the assumptions that explain the relationships of the study components, and explain the research approach (Rocco & Hatcher, 2011). ELT theory is based on the constructivist perspective of John Dewey and William James, who expanded outside of traditional vocational education theories and studied the idea that experience is the key contributor to solidifying learning. In constructivism, the learner 'constructs' their own knowledge based on their experiences (Gray & Herr, 1998). Vygotsky, Piaget, and Wittrock made key contributions to support this theory. Vygotsky's work, published in Russian in 1928, did not receive widespread appreciation until after it was translated into English 30 years later (Duane & Satre, 2014).

Vygotsky discusses the learning process from the perspective of psychology. He uses the example of Pavlov's dog, learning to salivate when he believes he will get food, as a primary example of how the mind can 'learn' through experience and react even

though the scenario may change (Vygotsky, 2012). He approaches constructivism from a psychological perspective, explains that experiential learning is more than just the experience, as it includes the processing of learning in the context of previous experience (Vygotsky & Cole, 1978).

Another scientist, Jean Piaget, studied babies as they developed the ability to speak (Piaget, 1936). His study of the development of language and other skills in children led him to theorize that complex understanding is born out of a combination of experiences (Piaget, 1953). Clearly, the children had no specific context to react to the teaching of language but were able to develop their communication skills.

To advance constructivism further, Wittrock published works on generative learning (1977). This work focused on creating meaningful relationships between concepts, knowledge, and experience (Wittrock, 1977). This process is broken down into four processes: attention, motivation, knowledge and preconceptions, and generation (Wittrock, 1992). Wittrock's approach requires the teacher to spend time understanding the students' preconceptions.

The implication for workforce educators is that instead of creating a curriculum and lecturing, the teacher must first spend time to get to know the student so that the learning can be adapted to their experience. One study of sixth graders revealed two cognitive processes were used when the students attempted solving mathematical word problems (Wittrock, 1992). The importance to note for education is that these methods of learning were not founded in rote memorization, nor did they result in the simple reproduction of an answer to the same problem. Instead, the research revealed that the

brain was able to take a variety of experiences and learn to solve different and more complex issues (Tobias, 2010). This is significant for industrial training, as the training session cannot effectively reproduce all variables that might exist during an actual event, but with enough experience and training, the employee might reason her way through the problem and identify a new solution.

Finally, the contributions of Kurt Lewin significantly established a foundation for experiential learning theory through studies that focused on laboratory teaching methods and T-groups (Kolb, 2015). Lewin also pioneered the action research method, which supported organizational development by helping guide a change from within the entity. These innovations were used to address administrative issues and close skill and knowledge gaps in the workforce. These early advances in experiential learning serve as a foundation for leveraging technological advancements, resulting in self-directed learning, simulations, and gamification (Kolb, 2015). These concepts have been applied to career and technical educators, which can enhance the learning process (Clark et al., 2010).

One example of this approach is seen in the changes in nursing education over the past decade. In 2010, an Institute of Medicine report called for changes in nursing education from content-based to more constructivist. A 2014 study in one nursing program tested this approach by changing the teaching model from traditional lectures and examinations to small group exams (Duane & Satre, 2014). The students first took the exam for a course as individuals. They were then broken into small groups of three to six students who worked together and took the exam a second time, as a group. The

results were measured over a two-year period, which revealed that the students and faculty surveyed were 50-75% more confident in mastering the material (Duane & Satre, 2014). Constructivism also established the concepts used on other experienced-based social and psychological learning theories. The learning methodology informs teachers in the way a classroom learning experience can be structured to maximize engagement, problem-solving, and long-term retention of learning (Richardson, 2003). It is this foundation upon which David Kolb developed his experiential learning theory (ELT).

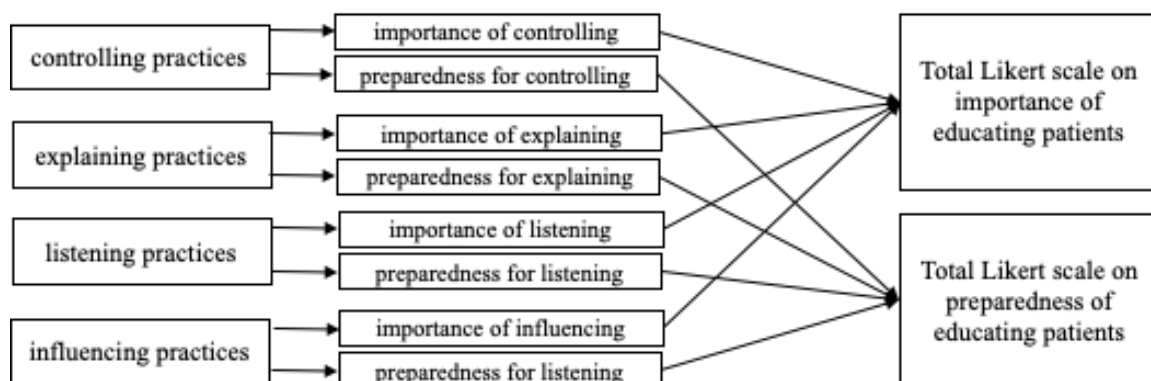
One of ELT's significant contributions is the experiential learning cycle, which is based on Piaget's model of learning and cognitive development (Kolb, 2015). Kolb defines the four parts of the cycle as concrete experience (CE), reflective observation (RO), abstract conceptualism (AC), and active experimentation (AE). These represent a continuous cycle of guided learning through experience. In addition, Kolb describes a learning styles inventory method for identifying the learning preferences that fall in the cycle's continuum. While the learner will progress through the cycle during the learning process, they will have an affinity for one of the learning perspectives. It is important to understand and identify those preferences as that may inform what teaching method to start with and to help guide the learner out of that preferred style through the rest of the cycle.

The impact of ELT is felt in many vocational environments, including emergency medical services (EMS) education. The entry-level EMS student is required to have some practical or clinical experience during the course. These experiences are related to the didactic teaching in the classroom. EMS students pursuing advanced certifications,

such as advanced EMT or paramedic, are required to have experience as an EMT before attending a program. The advanced programs have even more clinical time and simulations designed to focus on specific skills, pathologies, patient types, and environmental challenges faced by the real-world practitioner. The prior experience and clinical rotations also serve as a foundation for the didactic sessions, further solidified through active experimentation in labs, hands-on scenarios, simulations, and structured clinical experiences. It is this learning process identified in the ELT that provides the structure for teaching the EMS provider to develop the skills, knowledge, and behavior needed to address patient health literacy gaps.

Conceptual Framework

The conceptual framework serves as a “supportable premise or the extension of such premise through a logical path of reported research and clear reasoning” (Rocco & Hatcher, 2011, p. 119). The CELI framework is a well-researched approach to assess a clinician’s competencies necessary to educate patients. CELI provides a published tool that includes specific practices and scoring for use in evaluating the four competencies of controlling, explaining, listening, and influencing (Carnell et al., 2022; Wouda & van de Weil, 2015). The practices are grouped into one of the four competencies, and a mean is calculated, one for the importance score by competency and a second for the preparedness score by competency. The scores of the practices are then combined in total for each the total importance and the total preparedness (see Figure 4).

Figure 4*CELI Data Flow Model for Calculating Dependent Variables*

The four competencies were defined by experts by grouping identified practices together and validated through several studies for reliability and validity (Wouda & van de Weil, 2012). The following lists the specific practices that define each competency as published by Wouda et al., 2011)

Controlling

- Invitational start of the consultation
- Summary of the foregoing (resume)
- Agreement upon the goal and subjects of the consultation
- Guiding the course of the conversation, keeping the prescribed conversational structure
- Control of patient's attention to the conversation – control of attention and participation when more than one interlocutor is present
- Extensive summary when changing to a new subject or closing the consultation

- General verbal and nonverbal presentation of genuineness, empathy, care, and competence
- Announcing and explaining activities, such as physical examination or writing
- Reinforcement of patient behavior which benefits the conversation and relationship
- Social conversation in order to show interest in the patient and put the patient at ease
- A clear and friendly completion of the consultation

Explaining

- True in content, realistic
- Use of clear and comprehensible language (choice of words, short sentences)
- Concise and structured with an introduction, paragraphs, and short summaries
- Interactive with pauses for reaction, dosed, guided by response – emotional or other
- Fitting into the frame of reference of the patient
- Convincing, vivid with appealing examples, referring to patients' experiences
- Repetition and support with visual aids
- Comprehension checks

Listening

- Verbal and nonverbal attending behavior, minimal encourages to talk
- Use of silence
- Paraphrasing
- Reflection of feelings and opinions

- Asking correct open and closed questions to elicit facts, feelings, and opinions
- Acquiring relevant information
- Concretizing
- Shading and confronting
- Summarizing the patient's story

Influencing

- Offering suggestions (and no orders), leaving room for contemplation
- Useful and acceptable phrasing of instructions and advice
- Reinforcement of patient problem-solving behavior
- Realistic presentation of advice, possibilities, promises and limitations
- Taking into account the 'bad news' nature of some information and advice
- Counselling, assisting with difficult decisions
- Constructive negotiation
- Rephrasing a problem into a shared problem
- Promoting the mutual acknowledgement of feelings and opinions
- Phasing the decision process, offering time for contemplation
- Making clear agreements and contingency plans
- Checks of approval of suggestions, instructions, advice, decisions and agreements

For this study, the survey development further reduced these practices to 16, with each of the four competencies having four practices. The means for these competencies and the overall mean for all 16 practices combined were analyzed for their relationship with the

EMS provider's certification level and years of EMS experience to answer research questions one and two. (see Figures 5 and 6).

Figure 5

Framework for Comparing EMS Certification Level and Survey Results

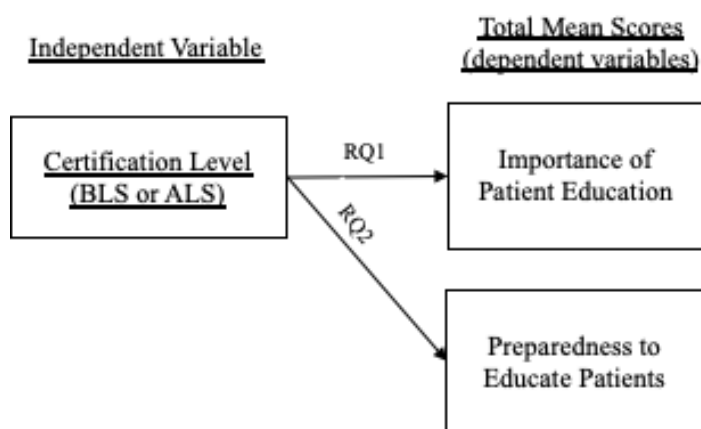
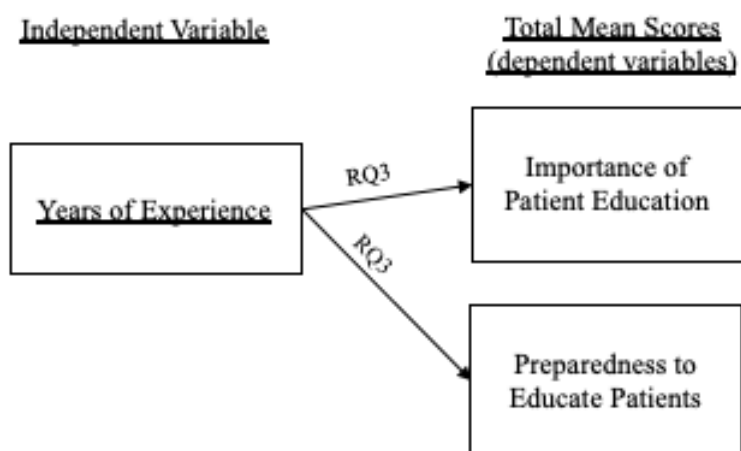


Figure 6

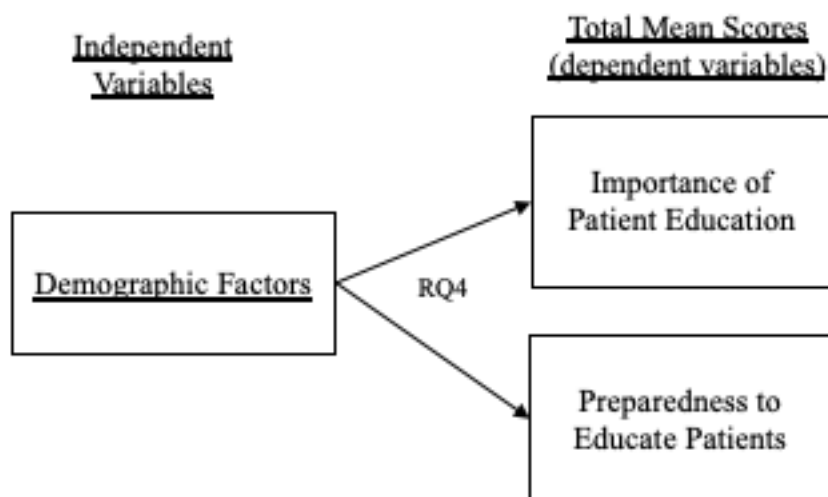
Framework for Comparing EMS Years of Experience and Survey Results



Finally, the demographics of survey respondents and environmental factors are analyzed for relationship with the two dependent variables (see Figure 7).

Figure 7

Comparing Demographic and Environmental Factors and Survey Results



Conclusion and Implications

Social determinants of health contribute to the long-term patient outcome, especially for the chronically ill and aging population. Patient health literacy contributes to the patient's understanding, decision-making, and lifestyle choices, which improves with higher literacy levels. Although internet websites and social media provide information about medical conditions, the quality of this information is inconsistent, and its applicability to a particular individual is questionable. The care team remains the highest-rated source patients rely on for clinical decision-making (Jones et al., 2011). Identifying health literacy gaps takes time, and designing on-the-spot lesson plans based on the patient's level of health literacy is problematic. In addition, systemic financial and throughput pressures for health system administrators reduce the time a physician must educate patients. Likewise, in the outpatient primary care environment, where

preventative medicine begins, there are seldom registered nurses in the office. This leaves a gap in health literacy that needs to be filled through other means.

EMS providers have been identified in the literature as a viable source of additional support to the healthcare system (Huang et al., 2018; Schofield et al., 2020). They have filled gaps by providing emergency and non-emergency treatment to chronic and at-risk to reduce readmissions and emergency department visits. While the literature is not as robust as for physicians and nurses, the published studies consistently identify a component of addressing issues related to low health literacy or providing patient education. However, none of the articles in this research has identified the specific skills, knowledge, and behaviors required, no development of a patient education competency for EMS providers has been studied, nor has any existing competency model been evaluated. While one study did specifically survey community paramedics according to Kolb's learning style indicator, it was not specific and treated experiential learning theory as a categorization instead of a process.

Chapter 3

Method

Purpose of the Study

The study compared the attitudes and perceptions of EMS providers with their experience by assessing the EMS providers' perceived importance and preparedness to perform the skills outlined in the competency. A cross-sectional convenience survey of EMS providers identified differences and similarities of attitudes in this workforce. The attitudes act as a guide for practitioners to develop new or evaluate current EMS programs interested in developing a patient education competency model.

The list of skills, knowledge, and behaviors is derived from existing patient education competency models and literature. The model developed by CanMEDS for assessing medical students and residents serves as a foundation for the empirical work. The model is the basis for the CELI tool, which has been tested for validity and consistency (Wouda et al., 2011). It groups behaviors into the categories of controlling, explaining, listening, and influence.

The survey identified EMS provider attitudes on the importance of the competencies and how prepared they feel administering them. For this study, the key predictor variable was the certification level of the provider. The variables of age, years of experience, and number of patient contacts were assessed for any moderating effect. Comparisons between the independent demographic variables, including age, gender, demographic area, and type of EMS service, were evaluated to identify any relationship to the dependent variables. The purpose of this study was to identify the correlation of

the independent variables to the four components of the patient education competency. In addition, questions were asked about the providers' perception of their organization's support and their opinion on whether delivering patient education is within the scope of practice for EMS providers. This chapter describes the overall study design, the instrument used, control variables, statistical methods, and proposed mitigations for identified methodological issues.

Research Questions

The overall purpose of this study was to identify what factors influence the EMS provider's perception of the importance of educating patients and their preparedness to perform the steps to accomplish that education. This objective was achieved by examining four research questions:

Research Question 1: What is the relationship between EMS providers' certification level and their perceived importance of educating patients?

Research Question 2: What is the relationship between EMS providers' certification level and their perceived preparedness to educate patients?

Research Question 3: What is the relationship between EMS providers' years of EMS experience and their perceived importance and preparedness to educate patients?

Research Question 4: What is the relationship between the demographic and environmental factors and the EMS provider's perceived preparedness of educating patients?

Research Design

The study design was a cross-sectional survey of perceptions and preferences of EMS providers based on the CanMEDS CELI patient education competency. First, an expert panel was established to guide the development of the survey (Dillman et al., 2014). Second, a pilot study was used to improve the content validity of the survey instrument. Next, EMS providers were recruited through networking and email solicitation. Emails were sent out to 28 individuals directly (see Appendix C). The study flyer was also attached (see Appendix D). This flyer was also posted to EMS groups on LinkedIn and forwarded to professional organizations for distribution consideration. Further distribution was obtained through chain sampling or snowballing. Snowballing is a non-probability sampling approach in which primary study contacts forward the study to additional contacts. This non-probability approach does introduce bias, as noted in the limitations section. Prior to distributing the survey, an exemption from the Institutional Review Board (IRB) from the Pennsylvania State University was secured (see Appendix E).

A pilot study improved the survey instrument as pilot studies “provide an initial evaluation of the internal consistency of the items; and to improve questions, format and instructions” (Creswell & Creswell, 2018, p. 154). Experts in emergency medicine, education, and research reviewed and provided feedback on the survey. A pilot study was performed from a purposeful sample that consisted of EMS educators and leaders. The results and feedback from the pilot study resulted in minor changes in wording,

format, and consistency. Only one pilot study was performed, as the suggested changes identified were minor (Dillman et al., 2014).

Once the survey instrument pilot phase was complete, the survey was created in Qualtrics. An invitation to the survey was electronically distributed to prospective participants. The introduction included information about the study, including the methods, confidentiality, and ethical considerations. The subjects remained anonymous and did not have access to the results outside of the publishing of the overall study. No demographic information that might identify specific individuals was used.

Data Collection

Inclusion Criteria for Study Participants

The population for this study included any certified, registered, or licensed practitioner who is currently, or has in the past, worked in the capacity of an EMS provider. The Bureau of Labor Statistics reports approximately 265,200 actively employed EMT or paramedics in the United States (2019). Unfortunately, no central repository captures this population's demographics or contact information, so a convenience sample was used (Patterson et al., 2016).

For this study, the target population was EMS providers currently or formerly certified as Emergency Medical Responder (EMR), Emergency Medical Technicians (EMT), Advanced EMTs, Paramedics (EMT-P), Prehospital Healthcare Registered Nurses (PHRN), or Emergency Physician. These certifications and licenses may be awarded by the NREMT or through that provider's state department of health (DOH).

Even though most states allow EMTs to be certified at age 16, for this survey, all respondents must be aged 18 or older in order to provide consent. They may be an active practitioner or past or retired EMS providers.

After the responses were collected, each participant was placed in one of two groups. EMS providers who self-identify as EMR, EMT, or AEMT were placed in a basic life support (BLS) category. EMS providers who self-identify as Paramedic, PHRN, or Physician were placed in an advanced life support (ALS) category. The American Red Cross differentiates these two categories by defining BLS as providing cardiopulmonary resuscitation (CPR), use of an automated external defibrillator, stabilizing fractures, controlling bleeding, and use of limited medications. ALS providers are described as providing BLS care and advanced airway management such as endotracheal intubation or cricothyrotomy, intravenous access, chest decompression, synchronized cardioversion and pacing, 12-lead electrocardiogram interpretation, and a wide variety of medications (American Red Cross, n.d.).

The desired sample size for each group was calculated using a 95% confidence interval and 5% margin of error using the following formula for large populations over 100,000 (Rae & Parker, 2014):

$$n = \left\{ \frac{Z_{\alpha} \pm \sqrt{p(1-p)}}{ME_p} \right\}^2$$

where:

n = required sample size

Z_{α} = Z score for alpha (level of confidence) = 1.96

$\sqrt{p(1 - p)}$ = standard error for a distribution sample of proportions.

ME_p = margin of error in terms of proportions

For the sample, the level of confidence is 5% (1.96), the p value for standard error is 0.5, and margin of error is 0.50. Based on this calculation, the minimum number of valid responses needed was 385.

Recruiting Study Participants

Bureau of Labor Statistics reported over 269,000 EMS providers were actively employed in the United States in 2022. However, the National Association of State EMS Officials (NASEMSO) reported 1,052,842 EMS providers in the United States (2020). The Bureau of Labor Statistics reported only actively employed workers, and the NASEMSO includes all certified EMS providers, including volunteers and those still certified but no longer employed. For this study, the sample was taken from any certified EMS provider, past or present, who is over the age of 18. There is no centralized source with contact information for all EMS providers, so convenience sampling was used with snowballing. The survey was distributed in the fall and early winter of 2023 through social media, direct email, and distribution of paper surveys. A total of 412 surveys were submitted, with 22 being excluded due to incomplete data, 11 surveys appearing abandoned, and nine surveys having data integrity issues, resulting in a sample size of 370. This study size was below the target by 15 studies, which might raise concerns about an underpowered study. However, the results of the analysis of this study revealed nearly every statistically significant test with a $p < .001$, which reduces the concern for

being underpowered. For any test that approached $p > .05$, careful consideration was given before accepting the null hypothesis.

Instrument

Responses were collected using an online tool and paper surveys. The online tool was Qualtrics (accessed through Penn State University). All responses were entered into Excel for cleaning and uploading into SPSS.

The data collection instrument was a survey based on the CELI evaluation tool developed by CanMEDS, which details a list of skills and knowledge required to demonstrate competency. Wouda et al. (2011) assessed the original instrument's interrater reliability, concept validity, and construct validity. The inter-rater reliability evaluated each component of the CELI instrument with three raters. A bivariate Pearson correlation was performed, resulting in a significant ($P < 0.01$; $n=30$) correlation for each measure with a 95% confidence interval (Wouda et al., 2011). Next, the researchers evaluated the concept validity using a principal component analysis resulting in approximately an evenly weighted distribution across the four categories. Finally, the construct validity assessed differences in both the subject's gender and patient satisfaction results (Wouda et al., 2011).

The survey development followed the structure of the CELI instrument. A panel of experts assisted in reviewing the CELI instrument components and identified key behaviors for each of the four competencies measured by the instrument. The original CELI instrument is used by trained physician evaluators when assessing medical

students, residents, and attending physicians during in-person simulations and includes 43 items (see Appendix B). The panel of experts and researchers distilled the 43 items into themes and created short statements representing the main themes of the CELI instrument. The intent was to shorten the survey to under ten minutes to maximize the response rate while maintaining the survey's content validity (see Table 1). Content validity describes the degree to which the study measures the subject it was designed to measure (Creswell & Creswell, 2018; Sheatsley, 1983). The researcher used the panel of experts to assist in evaluating the instrument's content validity, using the original CELI evaluation tool developed by Wouda et al. (2011). The panel also reviewed the survey for clarity, brevity, and design.

Table 1

Practices of the Patient Education Competency in the Survey

Controlling (C)

- C1. Introduce or announce yourself.
- C2. Keep the patient or caregiver's attention focused.
- C3. Show empathy, care, or compassion.
- C4. Explain what you are about to do before doing it, such as applying a blood pressure cuff or starting an IV.

Explaining (E)

- E1. Be truthful and clear when explaining medical terms and treatment.
- E2. Consider language, culture, or dialect barriers
- E3. Verify the patient understands the care and treatment plan.
- E4. Use examples to explain the pathology or treatment to the patient.

Listening (L)

- L1. Repeat back or paraphrase the patient's statement.
- L2. Give the patient an opportunity to explain or clarify their statements.
- L3. If the patient is unclear, ask for the same information several different ways.
- L4. Address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns.

Influencing (I)

- I1. Provide realistic possibilities when refusing recommended treatment or transport.

- I2. Negotiate with the patient about treatment and/or transport options.
 - I3. Use plain, direct language if delivering unwelcomed or 'bad news'.
 - I4. Use additional resources to help the patient's understanding of their options.
-

The survey was divided into three sections. The first section includes eight questions on basic demographic data, which will be used to compare the sample to the population as well as identify potential relationships to the dependent variables. The second section has four questions for each of the four competencies focused on controlling, explaining, listening, and influencing. For each of these competencies, the participant is asked to score both their perceived importance and preparedness using a Likert scale. The final section asks five questions about the provider's environment to determine if other factors influence their ability or desire to deliver education to patients. The end of the survey presented the participant with two qualitative questions that allowed additional comments on factors that influenced their perspective on patient education.

Each of the four competencies was assessed by self-rating the importance of skills using a five-point Likert scale with 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. The preparedness variable was evaluated using a 4-point scale 1=unprepared, 2= moderately unprepared, 3=moderately prepared, and 4= very prepared.

Once the study received an exemption from the Institutional Review Board of Penn State University in March of 2023, it was released to a pilot group (see Appendix D). The goals of using a pilot group for a survey instrument are to identify issues with survey questions, measure response rates and distributions, identify trends in non-

response questions, and determine if the survey is adequate for distribution to the sample population (Dillman et al., 2014).

The initial survey had a fourth component consisting of four vignettes representing common scenarios faced by EMS providers at any certification level and across any patient population demographic. Each one had questions revolving around the four competencies from the CELI patient education competency model. Vignettes are short scenarios used to describe realistic but hypothetical situations when impractical to simulate for direct observation (Presser et al., 2004). This method is often employed in clinical examinations when it is difficult or impractical for a researcher to directly observe a clinician's behavior due to time, cost, patient confidentiality, consent, and safety (Keene et al., 2022). Select members of the expert panel assisted in developing and reviewing the vignettes and were included in the pilot. However, they were excluded from the survey due to significantly increasing the time it took to complete the survey and a significant disparity in the interpretation of the scenarios.

Informed Consent

Study participants were presented with a consent form prior to seeing or answering survey questions. The consent language was included in the instructions and explained that their participation is voluntary, they must be age 18 or over, that they may withdraw at any time during or after they had completed the survey, that their identities would not be tracked, and completion of the survey implied consent. Additionally, they

were informed that while every effort would be made to keep their responses confidential, it was possible for a data breach to expose their information.

Dependent Variables

The two primary dependent variables represent the total mean Likert scale for the EMS provider's perception of importance and preparedness. Each of the two primary variables is the mean of the combination of the four competencies making up the patient education competency. Therefore, the calculation for each variable is $(\text{importance}(\text{controlling} + \text{explaining} + \text{listening} + \text{influencing}))/4 = \text{total importance}$ and $(\text{preparedness}(\text{controlling} + \text{explaining} + \text{listening} + \text{influencing}))/4 = \text{total preparedness}$. The responses to the 16 questions representing 16 practices are evenly divided into four groups of four questions. The mean of each group of four questions represents the related competency. For example, the mean for the listening competency related to importance is the mean of the Likert scores for the importance answer to the four questions in the listening section. For clarification, Figure 8 illustrates the mapping of the first four survey questions, which focus on controlling. Next, the overall Likert scale values for each competency are combined into a total score for importance and a total score for preparedness (see Figure 9).

Figure 8

Example Mapping Survey Question to an Individual Competency

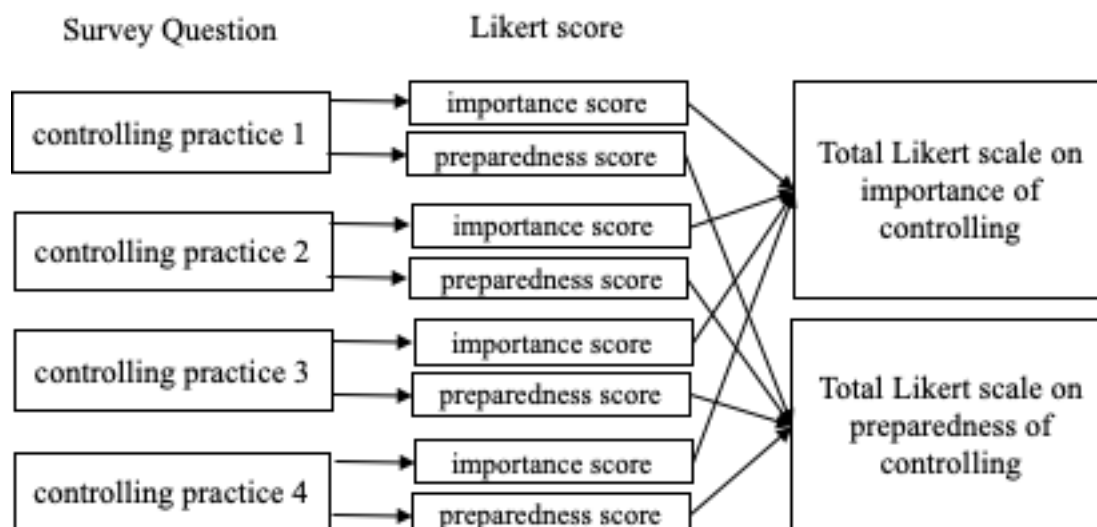
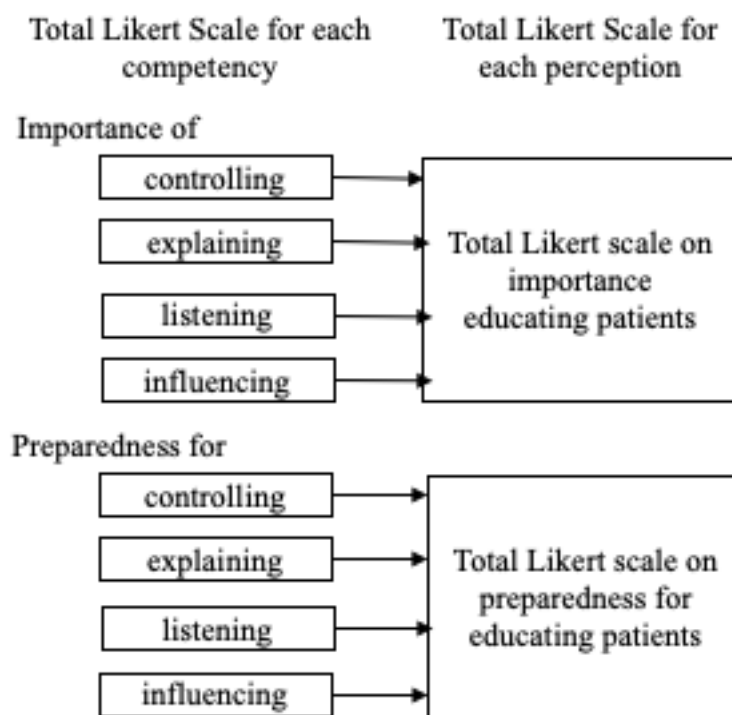


Figure 9

Mapping each Competency to Total Importance or Preparedness



Total perception of the importance of educating patients

This variable represents the respondents' overall perception of the importance of their role in educating patients. It is the mean of all responses to the 16 questions representing 16 practices related to importance. The variable represents the mean of ordinal data calculated from a 5-point Likert scale.

Total perception of their preparedness for educating patients

This variable represents the respondents' overall perception of their preparedness for educating patients. It is the mean of all responses to the 16 questions representing 16 practices related to preparedness. The variable represents the mean of ordinal data calculated from a 4-point Likert scale. For this scale, the midpoint was not included to prevent respondents from using it as something other than intended, such as not applicable or not sure.

Independent Variables

This study has two main effect variables: the provider's years of experience and level of certification. The certification level is not intended to represent didactic education. EMS certifications have a prerequisite for both didactic topics and clinical experience, where the student develops skills and skill mastery, similar to an apprenticeship program. The EMS years of experience is purely the number of years the participant practiced as an EMS provider.

Other demographic variables were collected to determine if other factors correlate with the results, such as age, gender, race, geography, and EMS organization type.

Years of EMS experience

The years of experience is a continuous variable representing the total EMS experience of the participant.

Clinical Certification or Licensure Level

This categorical variable identifies the highest level of certification or licensure of the participant. The level of licensure may influence the provider's perception of the importance and their preparedness to provide patient education. The categories are 1=not certified, registered or licensed, 2=emergency medical responder (EMR), 3=emergency medical technician (EMT), 4=Intermediate or Advanced EMT, 5=Paramedic, 6=PreHospital Registered Nurse (PHRN), 7=Physician, 8=Other.

BLS/ALS

The Basic Life Support (BLS)/Advanced Life Support (ALS) variable is derived from the clinical certification or Licensure Level. BLS-level certifications (Emergency Medical Responder and Emergency Medical Technician) are generally entry-level, having no prerequisite EMS experience. ALS level certifications (Advanced Emergency Medical Technician, Paramedic, and Prehospital Healthcare Provider which is a registered nurse or physician) have a prerequisite of a BLS certification for admission.

Demographic Factors

Demographic factors were captured to analyze the sample distributions and identify a possible correlation with the dependent variables. The demographics included were age, gender, race, community demographic, EMS company service type, and average weekly contacts. The last three variables are further defined below.

Community Demographic

This categorical variable generally represents the population count and density of the EMS provider's main service area. The categories are 1=rural or small community (less than 25,000 people), medium to large community (25,001-150,000), mid-sized urban area (150,001-500,000), large urban area (over 500,000), suburban area outside a mid-sized or large urban area.

EMS Company Service Type

The EMS company service type represents the primary organizational structure of the EMS organization. The type of organization may influence the participant's perception of the importance of educating patients. This may inform leaders of certain types of organizations on additional challenges or opportunities for developing the patient education competency among their EMS providers. The categories are fire-based service, hospital-based EMS, private for-profit, private not-for-profit, municipal or governmental that is not fire service based, educational institution, or other.

Average Weekly Patient Contacts

This is a self-reported whole number estimate of the average number of patient contact, creating an interval variable. When combined with the years of experience, it gives an indication of how much experience a provider has in engaging with patients.

BLS or ALS(derived)

This nominal variable is derived from the Clinical Certification or Licensure variable(CCLV) and was recoded based on 2=BLS, 3=BLS, 4=ALS, 5=ALS, 6=ALS, and values of 1 will be excluded as that represents those never certified in EMS. The samples will be grouped by BLS and ALS providers. ALS providers are required to first be BLS providers or have equivalent experience if a registered nurse in order to take any ALS certification exam.

Age started in EMS

This continuous variable was only used for data validation and is calculated by subtracting the EMS Experience variable from the Age variable, resulting in the possible age the respondent started in EMS. It is important to note that this is only used to validate each individual record's data integrity, as it is possible and likely that some of the survey respondents may be retired or otherwise left the profession which would incorrectly raise any mean calculated by this statistic. In the past, it was possible to be 15 years old and volunteer in EMS. Today, most states allow 16-year-olds to get certified

and volunteer or work in EMS. For this study, any individual survey response reporting an age started in EMS less than 15 will be excluded.

The demographic variables and response options are represented in Table 2.

Table 2

Demographic Variables

Independent Variable	Measures
Age	Continuous
Gender	1 = Male (he, him, his) 2 = Female (she, her, hers) 3 = Nonbinary (they, them, theirs) 4 = prefers not to answer
Population Demographics	1 = Rural 2 = Suburban 3 = Suburban/Urban 4 = Metropolitan/City
Years of EMS Experience	Continuous
Clinical Certification Level	1=Not certified, registered or licensed, 2=Emergency Medical Responder (EMR), 3=Emergency Medical Technician (EMT), 4=Intermediate or Advanced EMT (AEMT), 5=Paramedic (EMTP), 6=PreHospital Registered Nurse (PHRN), 7= Physician 8=Other
Race/Ethnicity	1 = Asian or Pacific Islander 2 = Black or African American 3 = Hispanic or Latino 4 = Native American or Alaskan Native 5 = White or Caucasian 6 = Multiracial or Biracial 7 = A race/ethnicity not listed 8 = Prefer not to answer

Independent Variable	Measures
Estimated average number of patient contacts per month	Continuous
BLS or ALS (derived)	1=BLS 2=ALS
Age Started in EMS (derived)	Continuous variable

The third section of the survey contains three questions concerning the EMS provider's environment, one question on their willingness to attend training, and one question asking if the survey had an impact on their thinking or awareness on this topic. All five questions use a 5-point Likert scale (see Table 3). These environmental components will help identify what possible relationship might exist between them and the overall scoring. It also serves as a source for possible future studies into controllable and uncontrollable factors that affect EMS provider's ability to not only educate patients but to care for them.

Table 3

Environmental factors

Question topic	Measures
Organizational support	1 = Strongly disagree ... 5 = Strongly agree
Impact of high call volume	1 = Strongly disagree ... 5 = Strongly agree
EMS provider responsibility	1 = Strongly disagree ... 5 = Strongly agree
More training	1 = Strongly disagree ... 5 = Strongly agree
Survey influence	1 = Strongly disagree ... 5 = Strongly agree

Finally, two optional open-ended questions allow the respondent to identify and explain factors that may have helped or hindered their ability to provide patient education.

Question 1: Think about a time when you provided education to a patient. What aspects of your education or experience helped you do that?

Question 2: Think about a time when you were hindered from providing patient education. What limited your ability to do that?

Data Analysis

This study assessed the relationship between the responses from EMS providers and their perception of the importance and preparedness to educate patients. Microsoft Excel and IBM SPSS Statistics for Mac (Version 29.0.1.1) were used for all statistical analysis, except where noted.

Before analysis of the results, the survey was evaluated for internal consistency. This analysis includes survey completeness as well as conflicting or unrealistic combinations. For example, if the respondent reports their age as 25 and years of EMS experience as 45, the age they started in EMS was -20, which is impossible. The researcher will reject the entire survey when data integrity errors are detected.

Next, an analysis using Cronbach's alpha measures internal consistency and scale reliability (Shadish et al., 2002). All responses were included as all scored above 0.7 and the overall score of the instrument was over 0.7 (Cho & Kim, 2015). Descriptive statistics on the independent variables are performed to aid the researcher in comparing the sample with available measures on the total population.

Demographics

The researcher performed a descriptive analysis on the demographic questions. For the continuous variables (age, years of EMS experience, average number of patient contacts), the mean was calculated with standard deviation, minimum and maximum value. These results were reported by Certification Group and in total. The remainder of the variables were categorical and reported on total count and percent of the total largely for the purpose of comparison to the known population and for identification of group sizes of significance.

CELI Practices

For the second section, the sixteen practices were grouped by four competencies. The scoring of practices for the importance of patient education is based on a 5-point Likert scale, and the practices of perceived preparedness of educating patients were based on a 4-point Likert scale. The Likert scale is an ordinal measure, meaning the points between values in the scale are not equidistant. Significant research as to the use of select parametric testing on Likert scale data has been performed and found to be acceptable (Bhattacharaya & Sengupta, 2021; Heeren & D'Agostino, 1987). Fagerland (2012) discussed the use of t-tests for samples greater than 50. For this study, each group exceeds 50, with BLS (n=105) and ALS (n=265). Additionally, each group exceeded the minimum sample size of 97 with 95% confidence and 10% margin of error. The central limit theorem assumes that with a large enough sample, the means will be normally distributed. In the case of this study, the distribution of the dependent variables are

skewed to the left, meaning the majority of respondents selected the Likert scale choices of usually important(4) and extremely important(5), or somewhat prepared (3) and well prepared (4). While normality is preferred when using parametric testing, the t-test appears less sensitive to non-normal distributions (Fagerland, 2012).

For research questions 1 and 2, the surveys are divided into two groups based on EMS certification level, BLS or ALS. The Likert scores for each of the 16 practices were grouped into one of four competencies. For each practice, descriptive statistics were calculated to show the mean and standard deviation for both the EMS provider's perceived importance and preparedness to educate patients. Next, the practices were grouped by competency, and a total mean was calculated for each competency by importance and by preparedness. Multiple t-tests were performed to compare the means of the dependent variables between the two groups. For each t-test, Levene's test was used to determine the appropriate results from the t-test depending on the homogeneity of variance. Finally, the t-test was selected over non-parametric tests such as Mann-Whitney U test or Kruskal-Wallis due to the size of the sample. The t-test compares the means of the groups, while the non-parametric tests use a form of rank-based analysis. The rank-based analysis may not accurately represent data with outliers that were purposefully included in order to represent the potential dichotomy between the groups.

For research question 3, the years of EMS experience variable was compared to the dependent variables representing total importance and total preparedness for patient

education. The Years of EMS experience is a continuous variable, so Pearson's r is calculated to assess the correlation for both direction and strength.

For research question 4, the demographics and environmental factors were compared to the two main dependent variables representing the total perceived importance of patient education and perceived preparedness to educate patients. For the demographic variables, the descriptive statistical analysis help the researcher determine if adequate representation exists between the groups in each category. The independent variables included in this test are all categorical with a continuous dependent variable, so an analysis of variance (ANOVA) test was used to analyze the relationships.

Finally, the optional open-ended questions will be reviewed for possible future study.

Study Assumptions and Limitations

In this study, five primary issues must be addressed. The first limitation is that the sample, while adequately sized, is not random but a convenience sample that is overrepresented by white male paramedics compared to known population data. The researcher has nearly 35 years of EMS experience which may result in influencing who responds. EMS providers who responded may know of or about the researcher, have similar experiences to each other, and be interested in the topic. Second, the survey responses represent the EMS provider's perception based on their interpretation of the question. The context of the questions is generic, but situations in the prehospital environment may result in the EMS provider feeling differently about the practice they

are evaluating when considering the circumstance of different interactions. Third, use of parametric tests may be less conservative than non-parametric tests.

Chapter Summary

The purpose of this chapter was to describe the methods for analyzing the relationship between the EMS provider's certification level, year of EMS experience, and demographic factors with the respondent's scores on the importance and preparedness for educating patients. To accomplish this, the practices were grouped into four competencies, which together represent the overall patient education competency. The quantitative methods described in this chapter are based on other studies that similarly study attitudes and behaviors using Likert-style surveys. Finally, two optional open-ended questions provided an opportunity to review qualitative data for trends intended to help identify future research opportunities.

Chapter 4

Results

This study explored the perceptions of EMS providers concerning the importance of educating patients and their preparedness to deliver patient education. The examination primarily focused on the relationships between the EMS provider's years of experience and certification level with their overall perception of importance and preparedness to deliver patient education. The cross-sectional study gathered self-reported surveys from EMS providers through Qualtrics, Survey Monkey, and paper. The study addressed the following research questions:

Research Question 1: What is the relationship between EMS providers' certification level and their perceived importance of educating patients?

Research Question 2: What is the relationship between EMS providers' certification level and their perceived preparedness to educate patients?

Research Question 3: What is the relationship between the demographic factors (gender, race, type of employer) and the EMS provider's feeling of preparedness to educate patients?

Research Question 4: To what extent do environmental factors of organization support and call volume impact the EMS provider's perception of their ability to educate patients?

Description of the Sample

Demographic data was collected on the respondent's age, years in EMS, gender, race, clinical certification or license, EMS organization type, and community population size (see Table 4). Males accounted for 83.2% (n = 308) compared to females at 16.8% (n = 62) of the survey respondents. The U. S. Bureau of Labor Statistics (USBLS) reports that 68.8% of actively employed EMS providers in the workforce are male. The sample skewing more towards males is partially explained by the large number of paramedics in the sample. According to the USBLS, paramedics are overrepresented in the sample and are more heavily weighted towards males than EMTs (2019).

The breakdown of race from the survey was 87.5% White (n = 323), 8.9% Hispanic or Latino (n = 33), 2.4% Black or African American (n = 9), 0.3% Asian or Pacific Islander (n = 1), 0.3% Native American or Alaskan Native (n = 1), and 0.8% Multiracial (n = 3). The predominant race represented in the sample is white (87.3%) compared to the number of whites in the population reported by the USBLS of 72% (2019). The National Association of State EMS Officials reports a recent mild shift in racial demographics, with a decreasing percentage of whites from 80% in 2011 to 72% today (2020). Hispanic and Latinos accounted for 8.9% of the sample, compared to 13% of the total population. Hispanics and Latinos represent the fastest-growing demographic in the population of EMS providers, which increased from 10% in 2011 to 13% in 2019 (U. S. Bureau of Labor Statistics, 2019).

Participants reported the EMS certification or license which they held with paramedics (EMT-P or NPR) at 71.1% (n = 263), followed by emergency medical

technicians (EMT) at 25.4% (n = 94), 3.0% were emergency medical responders (n = 11), and 1.1% were advanced or intermediate EMTs (n = 1.1). No prehospital registered nurses (PHRNs) or physicians completed the survey. The distribution of this demographic in this sample is more highly represented by paramedics when compared to the total population. According to the U.S. Bureau of Labor Statistics and the National Registry of EMTs, there are approximately three times the number of certified EMTs than Paramedics in the United States (2022). This is significant to note when analyzing the aggregate data from the survey and supports the importance of comparing the two groups.

The predominant community demographic represented was from medium-sized cities at 47.3% (n = 175), followed by 28.4% Suburban – Outside of a city (n = 105), 11.4% Medium to Large Community (n = 42), 10.5% Large City (n = 39), 1.4% from Rural (n = 5) and 1.1% from other (n = 4).

The survey participants reported the organization type they most identified with as the Private, Not for Profit at 81.6% (n = 302), followed by 6.5% fire department-based services (n = 24), 4.6% hospital-based (n = 17), 4.3% private for-profit service (n = 4.3%), 2.7% municipal or governmental (n = 10), and 0.3% from an educational institution (n = 1).

Based on the demographic data on the community demographic and organization type, it appears large cities may be underrepresented in the sample. This is noted and discussed in the limitations section.

Table 4*Demographic Characteristics of Participants*

<i>Demographic</i>	<i>n</i>	<i>%</i>
Gender		
Female	62	16.8%
Male	308	83.2%
Race		
Asian or Pacific Islander	1	0.3%
Black or African American	9	2.4%
Hispanic or Latino	33	8.9%
White or Caucasian	323	87.3%
Multiracial	3	0.8%
Native American or Alaskan Native	1	0.3%
EMS Certification or License		
EMR – Emergency Medical Responder	11	3.0%
EMT – Emergency Medical Technician	94	25.4%
AEMT – Advanced or Intermediate EMT	2	0.5%
EMT-P or NRP - Paramedic	263	71.1%
Community Demographic (population)		
Rural (less than 25,000)	5	1.4%
Medium to Large Community (25,000-150,000)	42	11.4%
Mid-Sized City (150,001-500,000)	175	47.3%
Large City (500,001+)	39	10.5%
Suburban – Outside of a city	105	28.4%
Other not listed	4	1.1%
Organization Type		
Fire-Based Service	24	6.5%
Hospital-Based Service	17	4.6%
Private, for-profit	16	4.3%
Private, not-for profit	302	81.6%
Municipal or Government (Non-Fire)	10	2.7%
Educational Institution	1	0.3%

The average age of the total respondents was 35.9 (n=370), with the BLS providers at 27.2 (n=105) and ALS providers at 39.3 (n=265). The average years of EMS

experience for all respondents was 15.2 years (n=370), with BLS providers at 5.1 (n=105) and ALS providers at 19.2 (n=265) (see Table 5).

Table 5:

Age and Experience by BLS or ALS Certification Group

<i>Demographic</i>	<i>n</i>	<i>Mean</i>	<i>Lower</i>	<i>Upper</i>	<i>SD</i>
Age					
BLS	105	27.2	18	61	10.2
ALS	265	39.3	18	72	11.6
Years of EMS Experience					
BLS	105	5.1	0.5	37	7.4
ALS	265	19.2	2	50	11.6

Note: ALS providers are required to have BLS certification and experience prior to being certified. Generally, most ALS certifications require 1 year of BLS experience.

Reliability Testing

The survey's reliability was tested using Cronbach's alpha. Cronbach's alpha is the most common measure for internal consistency and reliability of an instrument. An acceptable value (>0.70) generally represents more reliability and was used as the threshold for assessing this survey. Reliability testing is especially important for this study as the instrument was newly developed (Groves et al., 2009). The data was analyzed using SPSS to calculate Cronbach's alpha to measure the reliability of the instrument. The survey included sixteen questions focused on specific practices within a competency. Each of the four competencies had four questions each. The Likert scores

of each of the four questions or practices were combined into a Likert scale. Cronbach's alpha was used to test the reliability of each of the eight variables. Each of the eight variables has Cronbach's alpha > 0.70 which supports the acceptable reliability of each Likert scale score being represented by the associated 4 practices or questions in the survey (see Table 6).

The variables were also grouped into the two overall variables of total importance and total preparedness. These variables represent the mean of the total Likert scores of all 16 practices. Cronbach's alpha for the Likert scale representing the total importance consisted of 16 items with a highly reliable value ($\alpha = .90$). The Cronbach's alpha for the Likert scale representing the total preparedness consisted of 16 items also with a highly reliable value ($\alpha = .91$) (see Table 7).

Table 6

Cronbach's Alpha (α) for CELI Likert scale variables by competency and importance or preparedness

Variable	Question	Importance # items (α)	Preparedness # items (α)
Controlling (C)		4 ($\alpha = .81$)	4 ($\alpha = .73$)
	C1. Introduce or announce yourself.		
	C2. Keep the patient or caregiver's attention focused.		
	C3. Show empathy, care, or compassion.		
	C4. Explain what you are about to do before doing it, such as applying a blood pressure cuff or starting an IV.		
Explaining (E)		4 ($\alpha = .76$)	4 ($\alpha = .86$)
	E1. Be truthful and clear when explaining medical terms and treatment.		
	E2. Consider language, culture, or dialect barriers		
	E3. Verify the patient understands the care and treatment plan.		
	E4. Use examples to explain the pathology or treatment to the patient.		
Listening (L)		4 ($\alpha = .77$)	4 ($\alpha = .89$)
	L1. Repeat back or paraphrase the patient's statement.		
	L2. Give the patient an opportunity to explain or clarify their statements.		
	L3. If the patient is unclear, ask for the same information several different ways.		
	L4. Address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns.		
Influencing (I)		4 ($\alpha = .93$)	4 ($\alpha = .97$)
	I1. Provide realistic possibilities when refusing recommended treatment or transport.		
	I2. Negotiate with the patient about treatment and/or transport options.		
	I3. Use plain, direct language if delivering unwelcomed or 'bad news'.		
	I4. Use additional resources to help the patient's understanding of their options.		

Note: internal consistency $\alpha \geq .90 = excellent$, $0.89 \geq \alpha \geq .80 = good$, $0.79 \geq \alpha \geq .70 = acceptable$.

Table 7

Cronbach's Alpha (α) for Likert scale variables by total competency and importance or preparedness

Variable	# items	(α)
Total Important (Ti)	16	$\alpha = .90$
Total Preparedness (Tp)	16	$\alpha = .91$

Note: internal consistency $\alpha \geq .90 = excellent$, $0.89 \geq \alpha \geq .80 = good$, $0.79 \geq \alpha \geq .70 = acceptable$.

Testing for Normality and use of Parametric testing

The population of EMS providers in the United States is large, with the U.S. Bureau of Labor Statistics reporting over 265,000 actively employed workers (2019). The National Registry for EMTs claims over 1,000,000 actively certified EMS providers and reports the disparity is due to volunteers and many others who are either not currently working in an EMS job but still certified or working in a non-EMS job that requires some medical certification. There is no central repository of EMS providers in the U.S. for researchers to access and create a random sample outside of select member or certification organizations, but none were found to generally allow for outside researchers. Therefore, the researcher used a variety of methods for cross-section convenience sampling, including social media, direct contact, and snowballing.

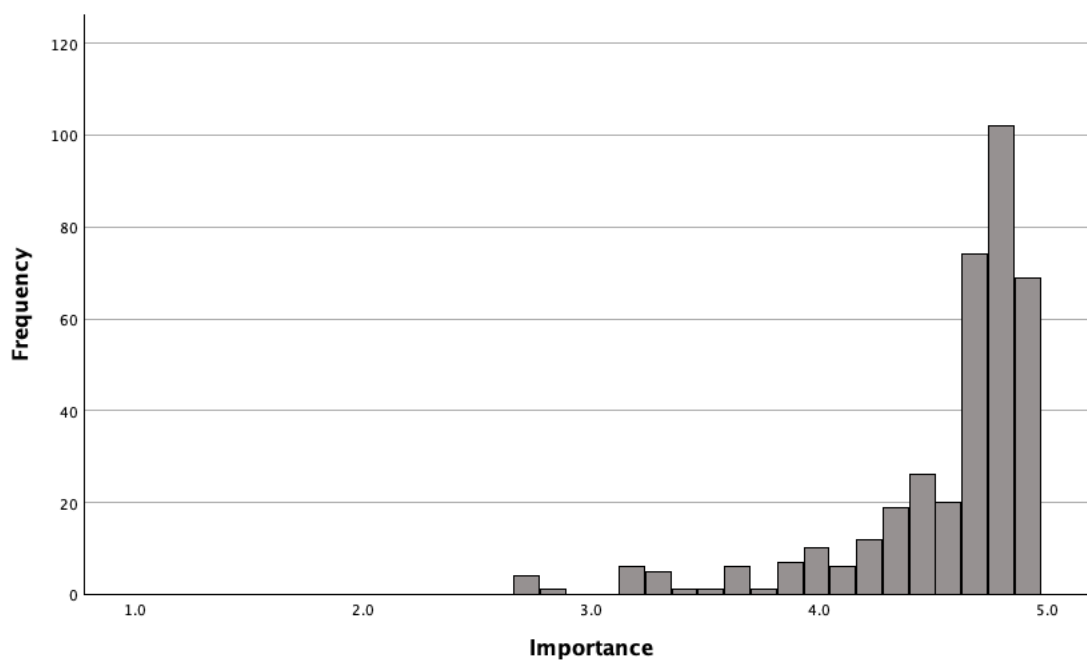
The dependent variables appear significantly skewed left on a histogram. For the variable representing the overall 5-point Likert scale mean of the 16 questions on importance, the mean was 4.56 with a standard deviation of 0.43, a skewness of -2.19, and kurtosis of 4.99 (see Figure 10). For the variable representing the overall 4-point Likert scale mean of the 16 questions on preparedness, the mean was 3.41 with a standard

deviation of 0.52, a skewness of -1.23, and a kurtosis of 0.88 (See Figure 11).

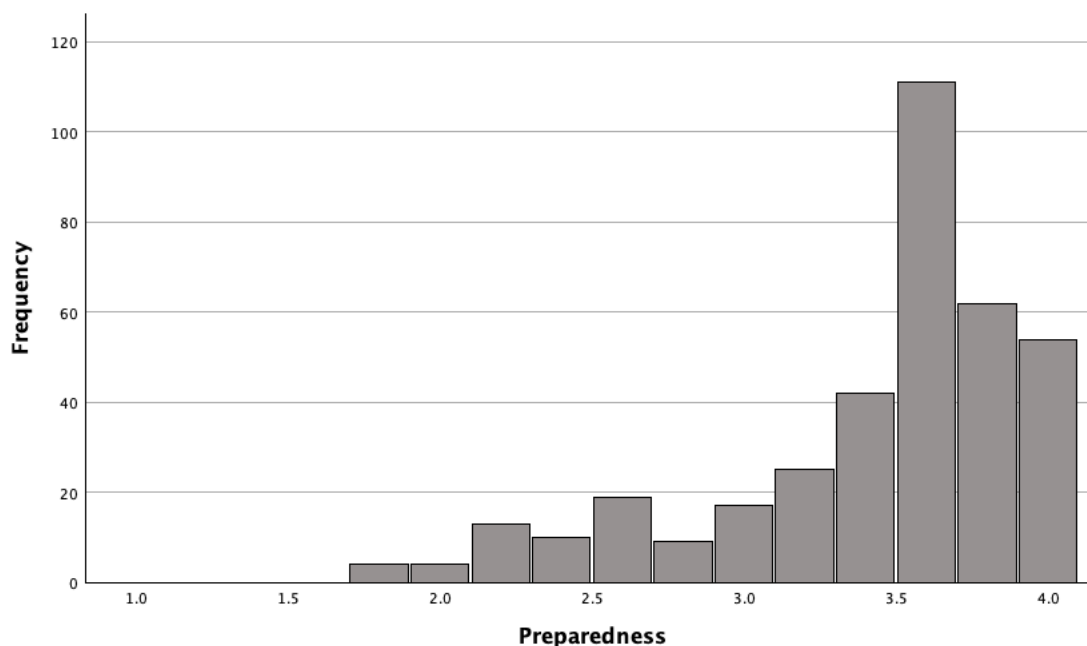
Transformations were applied in SPSS using Log, Log10, and square root, with no material difference. Both histograms appear generally unimodal.

Figure 10

EMS Provider Rating of the Importance of Educating Patients



Note. The distribution of the total mean 5-point Likert scale for the survey responses to the 16 questions on the importance of educating patients.

Figure 11*EMS Provider Rating of their Preparedness to Educate Patients*

Note. The distribution of the total 4-point Likert scale means for the survey responses to the 16 questions on the respondent's preparedness to educate patients.

Outliers were identified using a boxplot for each variable but were not excluded from the study. Outliers should not automatically be categorized as harmful or an error but should be analyzed, categorized, and studied further (Aguinis et al., 2013). The outliers were determined to be interesting, as defined by Aguinis et al., by first testing each for errors and then assessing based on the domain of the study (2013). First, these outliers were tested for potential errors. The outliers were determined not to be errors; therefore, “any potential error outlier that is not an actual error outlier automatically becomes a potential interesting outlier” (Aguinis et al., 2013, p. 287). The second step is

to consider the data in the study context. For this study, the sample was not random but of convenience. Therefore, any outlier may represent a segment of the population that is underreported in this study. In addition, due to the significant underrepresentation of certain demographics in the EMS provider population, such as females or non-whites, all perspectives become significant. Eliminating these outliers may further homogenize the data and hinder identifying the opportunity for further study in underrepresented demographics.

Study Findings

Research Question 1: What is the relationship between EMS providers' certification level with their perceived importance of educating patients?

The respondents were asked to rank their perceived importance of 16 practices using a 5-point Likert scale. Each practice was grouped into the four competencies of controlling, explaining, listening, and influencing. These categories combine into the overall patient education competency based on the CELI tool. Analyzing the mean for each practice across all respondents (n=370) revealed the total mean was above four on a 5-point Likert scale, which is between usually important and extremely important, with most standard deviations well below 1.0, except for the influencing competency.

Analyzing each practice by certification level, the ALS providers (n=265) had means between 4.58 and 4.93 and standard deviations between 0.25 and 0.64. For the purpose of this study, any standard deviation less than 1.0 is considered small. However, BLS providers (n=105) had three of the four practices under the influencing competency

below 4, with means between 3.79 and 3.90 and standard deviations between 1.10 and 1.54. Further analysis of this practice did not reveal any significant relationship based on age, race, gender, organization type, or community size (See Table 8).

Table 8

Perceived Importance of Educating Patients

Practice	Importance of providing patient education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Controlling (C)						
C1. Introduce or announce yourself.	4.46	0.77	4.88	0.35	4.76	0.54
C2. Keep the patient or caregiver's attention focused.	4.29	0.83	4.86	0.35	4.69	0.59
C3. Show empathy, care, or compassion.	4.12	0.93	4.42	0.51	4.34	0.67
C4. Explain what you are about to do before doing it, such as applying a blood pressure cuff or starting an IV.	4.55	0.71	4.88	0.34	4.78	0.5
Explaining (E)						
E1. Be truthful and clear when explaining medical terms and treatment.	4.50	0.70	4.93	0.25	4.81	0.47
E2. Consider language, culture, or dialect barriers.	4.37	0.75	4.70	0.48	4.61	0.59
E3. Verify the patient understands the care and treatment plan.	4.57	0.52	4.66	0.58	4.63	0.57
E4. Use examples to explain the pathology or treatment to the patient.	4.24	0.74	4.58	0.63	4.48	0.68
Listening (L)						
L1. Repeat back or paraphrase the patient's statement.	4.23	0.82	4.58	0.62	4.48	0.7
L2. Give the patient an opportunity to explain or clarify their statements.	4.21	0.83	4.73	0.51	4.59	0.66
L3. If the patient is unclear, ask for the same information several different ways.	4.28	0.77	4.62	0.58	4.52	0.66

Practice	Importance of providing patient education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
L4. Address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns.	4.33	0.76	4.69	0.55	4.59	0.64
Influencing (I)						
I1. Provide realistic possibilities when refusing recommended treatment or transport.	4.16	1.23	4.92	0.41	4.7	0.81
I2. Negotiate with the patient about treatment and/or transport options.	3.90	1.54	4.76	0.64	4.51	1.05
I3. Use plain, direct language if delivering unwelcomed or 'bad news'.	3.79	1.58	4.87	0.46	4.56	1.05
I4. Use additional resources to help the patient's understanding of their options.	3.83	1.10	4.78	0.53	4.51	0.85

All 16 practices were combined to represent the total perceived importance score. This score represents the EMS provider's perceived importance of educating patients based on the 16 practices. The expectation was that EMS providers should consider the education of patients to be important. However, because ALS providers and BLS providers have different levels of training, it was important to identify any differences between the two groups since the national EMS curriculum identifies the ALS provider as having the responsibility of patient education.

The scores from the practices were combined into one of the four competencies that comprise the patient education competency (see Table 9). The total (n=370) means for all competencies were between 4.55 and 4.64, with standard deviations all below 1.0. It is important to note that the overall mean for influencing was 0.95 and approached the threshold. As expected from the detailed data, the BLS providers rated the influencing

competency lower, with a mean of 3.92 (SD=1.24). In total, the mean for the importance of educating patients across both levels of providers in the sample were 4.22 and 4.69, which represents an overall perception of patient education being important.

Table 9

Summary Means of Importance by Competency

Competency	Importance of Providing Patient Education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Controlling	4.42	0.58	4.76	0.21	4.64	0.6
Explaining	4.43	0.58	4.72	0.33	4.63	0.59
Listening	4.1	0.59	4.45	0.4	4.55	0.67
Influencing	3.92	1.24	4.83	0.43	4.57	0.95
Patient Education Competency Score	4.22	0.98	4.69	0.58	4.60	0.77

To assess the relationship between the two groups, independent t-tests were performed using the mean values of the four competencies (see Table 10). Levene's test was performed to assess the equality of variances between the means of the two groups for each of the four competencies. Levene's test for equality of variances was significant for all four competencies ($p < 0.001$); therefore, the assumption of homogeneity of variances was rejected. This requires the use of the unequal variances not assumed result from the t-test.

The t-test shows a significant difference ($p < .001$) between the means for each competency, with the most significant difference of -0.9 for the influencing competency. The most significant difference between the BLS group ($M=3.92$, $SD=1.24$) and the ALS group ($M=4.83$, $S=0.43$) is with the influencing competency $t(114) = -7.34$, $p < .001$.

Table 10

Independent t-test Comparing BLS and ALS groups by Competency for Importance

Competency	BLS (n=105)		ALS (n=265)		Mean Difference	T statistic	p-value
	M	SD	M	SD			
Controlling	4.42	0.58	4.76	0.21	-0.34	-5.88	<.001
Explaining	4.43	0.58	4.72	0.33	-0.30	-4.92	<.001
Listening	4.1	0.59	4.45	0.4	-0.35	-5.59	<.001
Influencing	3.92	1.24	4.83	0.43	-0.91	-7.34	<.001
Total	4.21	0.63	4.69	0.20	-0.47	-7.56	<.001

Research Question 2: What is the relationship between EMS providers' certification level and their perceived preparedness to educate patients?

Similar to research question 1, research question 2 uses the same analytical approach to assess the EMS provider's perceived preparedness to perform the 16 practices described in the survey. The respondents scored their preparedness to perform each practice using a 4-point Likert scale. While the respondent may consider a practice important, they may not feel prepared to perform that practice. Each practice was

similarly grouped into one of the same four categories that represent the competencies of controlling, explaining, listening, and influencing. The survey responses were grouped into two groups representing BLS and ALS providers based on the self-reported certification level of the respondent.

The question focuses on the respondent's feeling of preparedness to perform the practice. Each practice was assessed as not prepared (or should not be done), minimally prepared, somewhat prepared, well prepared.

For the controlling competency, the scores across both groups of providers appeared similarly for most practices, with a mean between a 3.06 and 3.80, with the practice of showing empathy, care, or compassion rating the lowest for the BLS group (M=3.06, SD=0.82) compared to the ALS group (M=3.45, SD=0.54) and the practice of keeping the patient or caregiver's attention focused the lowest for the ALS group (M=3.36, SD=0.62).

For the explaining competency, the scores were more disparate between groups. For BLS providers, the mean was between 2.37 and 2.92 and for the ALS group between 3.10 and 3.84. Both groups identified the lowest practice of consider language, culture, or dialect barriers as the lowest. The standard deviation for this practice was the highest in both groups at 1.18 for the BLS group and 0.74 for the ALS group.

For the listening competency, the means were more disparate between groups. The BLS group mean was between 2.37 and 2.92 and ALS group between 3.10 and 3.84. Both groups identified the lowest practice of considering language, culture, or dialect barriers as the lowest. The standard deviation for this practice was the highest in both

groups at 1.18 for the BLS group and 0.74 for the ALS group. Both groups also shared the highest mean for the same practice to be truthful and clear when explaining medical terms and treatment. The mean for the BLS group was 2.92 (SD=0.80) compared to the ALS group with a mean of 3.84(SD=0.38).

The means for the listening competency practices were between 2.80 and 3.77, with all practices above a 3.0 in total. For both groups, the lowest mean was for the practice to address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns. For this practice, the mean for the BLS group was 2.80 (SD=1.11), and for the ALS group was 3.63 (SD=0.72).

The means for the influencing competency practices for the BLS group were between 2.16 (SD=1.23) to 2.65 (SD=1.17). For the ALS group, the means ranged from 3.72 (SD=0.70) to 3.82 (SD=0.59). Both groups scored the practice of using additional resources (item I4) as the lowest compared to providing realistic possibilities when refusing recommended treatment or transport (item I1) as the highest (see Table 11).

Table 11

Reported Preparedness to Educate Patients

Practice	Preparedness for providing patient education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Controlling (C)						
C1. Introduce or announce yourself.	3.70	0.54	3.80	0.40	3.77	0.45
C2. Keep the patient or caregiver's attention focused.	3.25	0.74	3.36	0.62	3.33	0.66
C3. Show empathy, care, or compassion.	3.06	0.82	3.45	0.54	3.34	0.66

Practice	Preparedness for providing patient education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
C4. Explain what you are about to do before doing it, such as applying a blood pressure cuff or starting an IV.	3.50	0.65	3.73	0.46	3.66	0.53
Explaining (E)						
E1. Be truthful and clear when explaining medical terms and treatment.	2.92	0.80	3.84	0.38	3.58	0.67
E2. Consider language, culture, or dialect barriers	2.37	1.18	3.10	0.74	2.89	0.94
E3. Verify the patient understands the care and treatment plan.	2.91	0.80	3.34	0.62	3.22	0.7
E4. Use examples to explain the pathology or treatment to the patient.	2.48	0.94	3.19	0.73	2.99	0.86
Listening (L)						
L1. Repeat back or paraphrase the patient's statement.	3.59	0.72	3.77	0.52	3.72	0.59
L2. Give the patient an opportunity to explain or clarify their statements.	3.45	0.66	3.73	0.56	3.65	0.6
L3. If the patient is unclear, ask for the same information several different ways.	3.10	0.91	3.67	0.57	3.51	0.73
L4. Address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns.	2.80	1.11	3.63	0.72	3.39	0.93
Influencing (I)						
I1. Provide realistic possibilities when refusing recommended treatment or transport.	2.65	1.17	3.82	0.59	3.49	0.95
I2. Negotiate with the patient about treatment and/or transport options.	2.36	1.26	3.73	0.72	3.34	1.09
I3. Use plain, direct language if delivering unwelcomed or 'bad news'.	2.30	1.23	3.76	0.65	3.35	1.07
I4. Use additional resources to help the patient's understanding of their options.	2.16	1.28	3.72	0.70	3.28	1.14

The scores from the practices were combined into one of the four competencies, which represent the respondent's preparedness to deliver patient education (see Table 12). The total (n=370) mean for all competencies was 3.41. The BLS group means were between 2.27 and 3.37, and the ALS group means were between 3.37 and 3.57. The competency with the lowest mean for the BLS group was influencing (M=2.27, SD=1.24), and the lowest mean for the ALS group was explaining (M=3.37, SD=0.69). The competency with the highest mean for the BLS group was controlling (M=3.37, SD=0.73) and for the ALS group was (M=3.76, SD=0.76).

Table 12

Summary Means of Preparedness by Competency

Competency	Preparedness to Provide Patient Education					
	BLS (n = 105)		ALS (n = 265)		Total (n = 370)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Controlling	3.43	0.47	3.59	0.35	3.53	0.61
Explaining	2.67	0.82	3.37	0.47	3.17	0.84
Listening	3.24	0.76	3.70	0.52	3.57	0.73
Influencing	2.38	1.14	3.76	0.63	3.37	1.07
Total Patient Education Competency	2.93	1.06	3.60	0.70	3.41	0.86

To assess the relationship of preparedness between the two groups, independent t-tests were performed of the mean values of the four competencies (see Table 13). Levene's test was again performed to assess the equality of variances between the means of the two groups for each of the four competencies. Levene's test for equality of

variances was significant for all four competencies ($p < 0.001$); therefore, the assumption of homogeneity of variances was rejected. This requires the use of the unequal variances, not assumed results from the t-test.

The t-test shows a significant difference ($p < .001$) between the means for each competency, with the most significant difference of -1.38 for the influencing competency. Each t statistic is negative, as the BLS group reported being less prepared to educate patients than the ALS group. For the influencing competency, the BLS group ($M=2.38$, $SD=1.14$) showed lower preparedness than the ALS group ($M=3.76$, $S=0.63$) for the influencing competency $t(114) = -11.69$, $p < .001$.

Table 13

Independent t-test Comparing BLS and ALS Groups by Competency for Preparedness

Competency	BLS (n=105)		ALS (n=265)		Mean Difference	T statistic	P value
	M	SD	M	SD			
Controlling	3.43	0.47	3.59	0.35	-0.16	-3.13	<.001
Explaining	2.67	0.82	3.37	0.47	-0.70	-8.20	<.001
Listening	3.24	0.76	3.70	0.52	-0.46	-6.78	<.001
Influencing	2.38	1.14	3.76	0.63	-1.38	-11.69	<.001
Total	2.93	0.63	3.60	0.29	-0.67	-10.43	<.001

Research Question 3: What is the relationship between the EMS provider's years of EMS experience and the perceived importance and perceived preparedness of delivering patient education?

The second independent variable used was the years of EMS Experience compared to both the importance and preparedness for each of the four competencies and overall patient education competency.

The relationship between years of EMS experience and the importance to provide patient education is performed to determine the influence on the dependent variables. Pearson's correlation coefficient was used as the years of EMS experience, and total importance of patient education competency variables are continuous (Schober et al., 2018). For the entire sample, the EMS experience mean is 15.19 years (N=370, SD=12.35). Pearson's correlation shows a moderately positive relationship between EMS experience and total patient education importance $r(368) = .40, p < .001$. The correlation between the years EMS experience and each of the means representing the respondent's perceived importance of the four patient education competencies was performed, with Pearson's r between .24 and .38. All correlations with the four competencies are considered weak (see Table 14). It's important to note that the overall distribution of the scores is significantly skewed left (see Figure 10). The low correlation reported by Pearson's r is not unexpected.

Table 14*Importance and EMS Experience*

Competency	<i>M</i>	<i>SD</i>	<i>r</i>	<i>sig</i>
Controlling	4.66	.39	.31**	.31**
Explaining	4.64	.44	.24**	.24**
Listening	4.35	.49	.31**	.31**
Influencing	4.57	.86	.38**	.38**
Total	4.55	.45	.4***	<.001

Note. Years of EMS experience (n=370, M=15.19, SD=12.35).

* very weak(0-.19), ** weak(.2-.39), ***moderate(.4-.59)

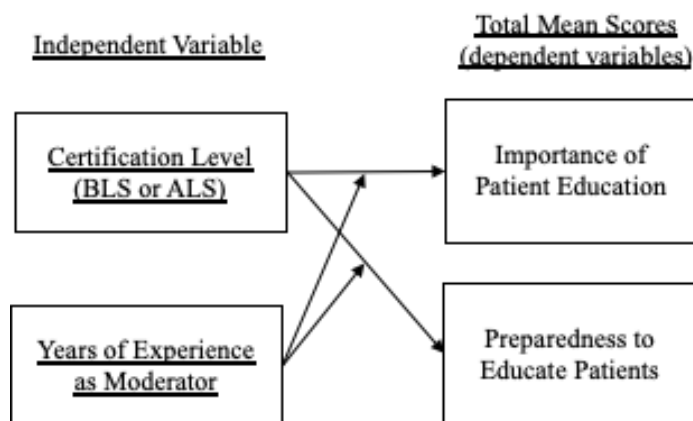
Next, Pearson's correlation was calculated between years of EMS experience and the means of the respondent's preparedness for each of the four competencies. The correlation with the preparedness for the controlling competency was very weak $r(368) = .15$, $p < .001$. The preparedness for the explaining and listening competencies are both weak at $r(368) = .33$, $p < .001$. The preparedness for the influencing competency was slightly moderately correlated $r(368) = .44$, $p < .001$. For the entire sample, the EMS experience mean is 15.19 years (N=370, SD=12.35). Pearson's correlation shows a weak positive relationship between EMS experience and total patient education preparedness $r(368) = .31$, $p < .001$ (see Table 15).

Table 15*Preparedness and EMS Experience*

Competency	<i>M</i>	<i>SD</i>	<i>r</i>	sig
Controlling	3.55	.4	.15*	<.001
Explaining	3.17	.67	.33**	<.001
Listening	3.57	.63	.33**	<.001
Influencing	3.37	1.02	.44***	<.05
Total	3.41	.52	.31**	<.001

Note. * very weak(0-.19), ** weak(.2-.39), ***moderate(.4-.59)

EMS Experience as Moderator. The variable EMS experience was analyzed for its possible role as a moderator to the relationship between EMS certification and the dependent variables (see Figure 12).

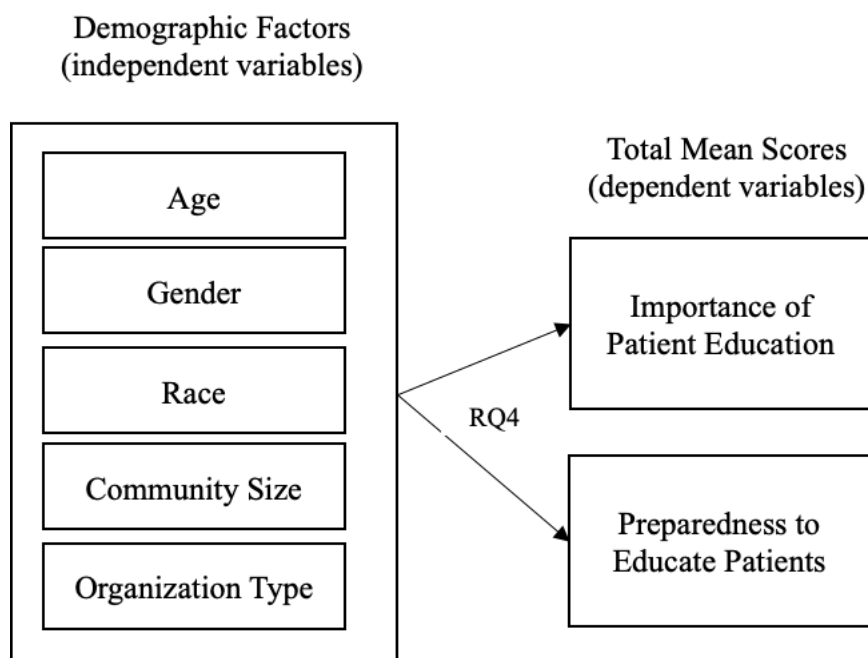
Figure 12*Years of EMS Experience as a Moderator*

Before statistically testing for the moderation of a relationship, key conditions must be met or the moderating effect may be unreliable (Hayes, 2018). One of the conditions is the assumption of homogeneity of variances. Levene's test was significant

($p < .001$), rejecting the assumption of homogeneity of variances. A second issue was found when comparing the correlation between the independent variable, certification level, and the moderator variable, years of EMS experience. The two variables were found to be highly correlated $r(368) = .61$, $p < .001$. The high correlation between the independent and moderator variables causes concern that the moderating effect may be overstated. Due to these violations, further analysis of moderation was not completed.

Research Question 4: What is the relationship between the EMS provider demographics and environmental factors?

During the development of the survey instrument, a panel of experts examined other possible relationships between demographic factors and the possible outcomes. For example, in some clinical settings, female physicians' student ratings significantly differ from their male counterparts (Morgan et al., 2016). For this analysis, both parametric and non-parametric tests were used to determine the relationship between the variables (see Figure 13).

Figure 13*Demographic Variables' Relationship to the Dependent Variables*

First, the relationship was analyzed using the ANOVA. For this test, two primary assumptions must be met, the assumption of normality and the assumption of homogeneity of variance. For the first analysis, comparing the five demographic factors with the variable representing the importance of patient education, Levene's test resulted in significant ($p < .001$) for all five variables. The homogeneity of variance is not met, as there is a significant difference between the variances. For the second analysis, comparing the five demographic factors with the variable representing the EMS provider's preparedness to educate patients, Levene's test again resulted in significant ($p < .001$) for all five variables. In addition, for the variables representing race, community

size, and organization type, several of the groups were very small. While there is no minimum sample size for using the ANOVA, that presumes a random sample. This sample was a convenience sample. In this case, there was not enough data in these demographic categories for a meaningful analysis.

Next, non-parametric tests were considered, as the assumptions for the ANOVA were not met. The Kruskal-Wallis test showed significance with the race and organization type variables. The Mann-Whitney U test was used to identify which relationship was significant. However, when reviewing the significantly different groups, the samples were homogenous. Bootstrapping was not used for these small samples as it would not add diversity. The only variable that met the criteria for testing was gender.

For the gender category, males (n=308) represented the majority of the respondents over females (n=62), with no respondents selecting other options. When comparing gender alone with the variable representing the importance of patient education, Levene's test was significant ($p = .12$). However, when comparing gender to the preparedness for educating patients variable, Levene's test was not significant ($p=.066$), confirming homogeneity of variance. A one-way ANOVA was conducted, but there was not a significant effect on the perception of preparedness to deliver patient education based on gender [$F(1,368) = .002, p = .971$].

Finally, the results of the questions representing the environmental factors of the EMS provider's perception of organizational support for educating patients, high call volume impeding delivering patient education, and EMS providers having a responsibility to educate patients were compared to both the overall scores of importance

and perception to educate patients (see Table 16). When asked if their organization supports providing patient education, $F = 268$ (72.4%) responded agree or strongly agree. EMS providers agreed or strongly agreed that a high call volume made it difficult to provide patient education $F = 270$ (73%) and agreed or strongly agreed that EMS providers have a responsibility to provide education to patients $F = 299$ (80.8%).

Table 16

Environmental Factors

Environmental Factor (n=370)		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Organizational Support	<i>F</i>	8	27	67	113	155
	%	2.2%	7.3%	18.1%	30.5%	41.9%
Call Volume	<i>F</i>	6	40	54	70	200
	%	1.6%	10.8%	14.6%	18.9%	54.1%
EMS Responsibility	<i>F</i>	0	34	37	94	205
	%	9%	9.2%	10.0%	25.4%	55.4%

Optional Open-Ended questions

At the end of the survey, two additional questions were available for respondents. The first question asked EMS providers to identify, explain, or describe aspects of their education or experience that helped educate patients (see Table 17). The responses to this question supported components of the survey such as experience, education, communication skills and time as important components, but additionally identified empathy, help from others. These factors may be opportunities for future research.

Table 17*Themes and Select Quotes on What Helped Provide Patient Education*

Comments	Theme(s)
<p>“My former training as a consultant, specifically related to "empathy" helped me in this situation. Slowed down, took more time to explain things to patient, let them calm down so they could understand, and then we moved forward - together.”</p> <p>“Empathy first and foremost allowed me to listen to what the limitations of the patients understanding of the situation, which allowed me to educate the patient as well as advocate for appropriate treatment pathways. Without empathy, listening to the patient, advocating for the patient or educating the patient is extremely hard”</p>	Empathy
<p>“An event which happens often is when the patient does not recognize the severity of their injury or illness or what the consequences of not seeking medical attention may be. I have often spent increased time on scene to educate the patient about the importance of seeking medical attention by one-on-one education”</p>	Time
<p>“Being an educator and using education classes taken to understand how to present information.”</p> <p>“Having an understanding of the patient’s condition allows you to explain to them their condition.”</p>	Education
<p>“With most of the patients I have had education-based conversation with, the in-depth knowledge of anatomy/physiology/pathophysiology was very helpful. However I found that linguistics actually benefitted the patient more (using plain, direct language/using a comparable scenario/ encouraging questions/asking open-ended questions.)”</p>	Communication Skills
<p>“Experience”</p> <p>“Experience”</p> <p>“Experience!”</p>	Experience

Comments	Theme(s)
<p>“Experience, in general, I believe has led me to be more attentive to the patient's needs/communication. There was a foundation provided when joining EMS 20-30 years ago, where the tenured providers taught the importance of educating the patients.”</p> <p>“Hearing how ER doctors explained the same or similar problem to a different patient.”</p> <p>“My clinical experiences allowed me to inform / educate the patient about the cardiac catheterization they would be having.”</p> <p>“Longevity, working in ER's, MICU's, and higher education...overall life experiences.”</p> <p>“My experience. My education covered pathologies and treatment, but I learned how to interact with people in the field and in life.”</p>	
<p>“having family members assist in convincing the patient to seek medical attention, or having the patient's family physician or medical command physician speak to the patient about the importance of seeking medical care.”</p>	<p>Help from others</p>

The second questions focused on identifying themes that hindered the EMS provider to delivery patient education (see Table 18). Several hindrances were not part of the survey and merit further exploration in future research. Some of these themes are beyond the control of the system, requiring the development of coping or adapting skills. These themes include the ability to control the scene or manage chaotic scenes, the patient's behavioral or medical condition, and language and cultural barriers. However, themes were also identified that are within the scope of control of EMS administrators, which include organizational pressure to move faster and workload.

Table 18*Themes and Select Quotes on What Hindered Providing Patient Education*

Comments	Theme(s)
<p>“Dangerous situation due to environment, side of road when providing treatment, needed to clear the scene quickly.”</p> <p>“Extremely chaotic or unsafe scenes.”</p> <p>“Complex environments with lots of distractions for the patient and provider.”</p>	Scene Control
<p>“Medical condition that required immediate treatment and transport”</p> <p>“Sometimes they patients mental status does not allow for proper education on a particular aspect of their care.”</p> <p>“Patient’s unwillingness to listen and accept the education”</p> <p>““Patient was very scared, and almost frozen, complete inability to make decisions.”</p>	Patient Condition/ Patient in Crisis
<p>“Language barrier and family interference.”</p> <p>“Language barriers”</p> <p>“Language”</p> <p>“Language/Cultural Barriers”</p>	Language
<p>“Have to be fast as possible due to call volume and company turn around policy”</p> <p>“Truck turn over time or on scene time.”</p> <p>“Time and pressure are the greatest hinderance in the company I am with. The pressure to 'turn and burn' calls really does not allow for patient education or even quality conversation.”</p>	Organizational Pressure
<p>“Call Volume”</p> <p>“Busy – our Call Volume”</p>	Workload

Chapter Summary

This chapter served as a review of the study methodology, including the study goals and research questions, the population demographics and sampling approach, and described the detailed results. The results of the first research question were presented using descriptive statistics and t-test to explore the relationship between the EMS provider's certification level with the dependent variables representing their perceived importance for patient education.

The second research question was approached similarly to compare the relationship between the EMS provider's certification with preparedness to educate patients.

The third research question was explored comparing the EMS provider's years of experience with dependent variables representing the survey scores for the perceived importance of patient education and preparedness to educate patients.

Finally, the results of the analysis on the fourth research question were presented, comparing demographic and environmental factors with the two main dependent variables, showing no significant relationship.

Chapter 5

Discussion

This study compares the relationship between the perception of EMS providers on the importance of patient education and their preparedness to educate patients with their certification level and years of EMS experience. The purpose is to assess whether the EMS provider's experiential education or 'time on the job' has a relationship to their beliefs and behavior towards educating patients.

The study's purpose is to identify opportunities for EMS educators, administrators, and field training officers (FTO) to develop and improve the patient education competency in their EMS providers. EMS providers' education is generally based on an experiential learning model with didactic education combined and synchronized with simulation and clinical rotations. The EMS provider's certification was used as a proxy for the amount of structured learning they received. A second factor, years of EMS experience, was identified as a possible second factor. The study goal was to address the following research questions:

Research Question 1: What is the relationship between EMS providers' certification level and their perceived importance of educating patients?

Research Question 2: What is the relationship between EMS providers' certification level and their perceived preparedness to educate patients?

Research Question 3: What is the relationship between EMS providers' years of EMS experience and their perceived importance and preparedness to educate patients?

Research Question 4: What is the relationship between the demographic and environmental factors and the EMS provider's perceived preparedness of educating patients?

This study uses a competency model and tool established by CanMEDS focused on the competency areas of communicating, explaining, listening, and influencing (CELI) (Wouda et al., 2011). A conceptual framework was developed using the CELI tool that is used in assessing a healthcare provider's patient education competency. The CELI tool is a well-tested patient education competency model used in the CanMEDS framework. CanMEDS is a competency model framework established and adopted by the Canadian Royal College in the 1990s (Wouda et al., 2011; Wouda & van de Wiel, 2012).

A panel of experts assisted in the development of the survey instrument based on the practices identified in the CELI framework. After receiving an exemption from the IRB, a small pilot was performed, which resulted in minor adjustments in the wording and structure of the instrument. A cross-sectional survey was developed based on the CELI framework and distributed to respondents both online and on paper. A random sample of the population was not feasible for this study, so a convenience sample with snowballing was acquired. The target population was current and former EMS providers aged 18 or older. The survey's reliability was measured using Cronbach's alpha, with all practices in the competency groups having an alpha value above .70. A combination of descriptive statistics and t-tests were used to compare the EMS provider's certification level with their perceived importance of patient education and perceived preparedness to educate patients. Pearson's r was calculated to compare the relationship between the

years of EMS experience and the two dependent variables representing the mean Likert scale score for the perceived importance of patient education and perceived preparedness to educate patients.

The study will provide guidance to EMS educators, practitioners, and administrators on developing and supporting programs and serves as a foundation for future studies.

Summary of Findings

Research on patient health literacy and the social determinants of health impact have been clearly linked with patient outcomes and patient expectations. The patient's care team was identified as a primary source that influences patient health literacy and clinical decision-making (Ladin et al., 2018; Levinson et al., 2010; Rao et al., 2007). EMS providers may have a role as care team members in improving the patient's health literacy (O'Meara et al., 2015; Patterson et al., 2016). Improving a patient's health literacy and medical decision-making requires the clinician, including the EMS provider, to develop competency in educating patients (Wouda & van de Weil, 2015). An important component of competency development in a workforce is the attitude or belief that the practices of competency are important (Joon Yoon et al., 2010; Hwang et al., 2017; Richard et al., 2018).

EMS programs should be well suited to structure programs based on experiential learning theory. These programs currently require a combination of didactic and clinical experience for graduation and certifications and are structured more similarly to

apprenticeship programs in career and technical education (CTE) when compared to traditional higher education.

For the purpose of this study, the EMS provider's certification level is intended to represent experiential learning attainment. The years of EMS experience variable shows the relationship between simple experience and the EMS provider's perception of patient education. The first research question focused on the relationship between the EMS provider's certification level with their attitude towards the importance of patient education and is intended to represent the attitude of the EMS provider towards that competency. The results indicated that the majority of respondents perceived patient education as usually important or extremely important. The results were analyzed by measuring the importance of the practices that represent the four competencies of controlling, explaining, listening, and influencing, revealing that the respondents perceived patient education to be between somewhat important and very important. The study participants were split into two groups based on certification level, BLS and ALS. Although the ALS group's means were higher than the BLS group, both groups consistently scored the importance of patient education as important or very important. If the scores were low, EMS educators, administrators, and managers would need to address this before attempting additional training interventions. This result provides a good foundation for further developing this competency in EMS providers.

The second research question focused on how prepared EMS providers felt in providing patient education based on responses to the 16 practices. The EMS providers were again separated into two groups, BLS and ALS. Both groups reported overall

feeling somewhat prepared. However, when assessed based on certification, the BLS group was significantly below the ALS group for each practice. The two competencies with the largest difference were explaining and influencing. For the explaining competency, further analysis showed that language and cultural barriers scored lowest for both groups, but BLS providers scored significantly lower for this practice. The second largest difference between the two groups for the explaining competency was with the practice of using examples to explain the pathology and treatment to the patient. The influencing competency had an even larger decrease from the ALS to the BLS group. All four practices in this competency were significantly lower for the BLS providers, which identifies an opportunity to explore further why the BLS providers feel so much less prepared. It is important to note that ALS providers are required to secure BLS certification and experience prior to beginning an ALS program. ALS providers have more experience-based education than BLS providers. This is an area that requires further research to determine if the difference is due to training or other systemic factors and the EMS system. The third research question focused on identifying a relationship between the EMS provider's years of EMS experience and their perception of the importance and preparedness to educate patients. This relationship was statistically significant but had a moderately low relationship with the overall patient education score and weak correlations when compared to each competency, except for a moderate correlation with the influencing competency $r(368) = .44, p < .001$. When viewed in the context of the responses to the open-ended questions, the term experience was used to

describe the EMS Provider's positive contribution to providing patient education. There are several possibilities for this possible dichotomy, requiring further study.

The relationship between the study respondents' demographics and environmental factors was compared to the EMS provider's perception of the importance and preparedness to educate patients. For example, while it tends to reason that EMS providers in a busy fire department-based service in a major city may have less time to provide patient education, the survey responses did not provide enough data for this analysis. For the environmental factors, a significant majority of EMS providers reported they agree or strongly agree that EMS providers have a role in delivering patient education. Their organizations support this activity, but the call volume and workload present a significant obstacle.

Several themes emerged from the open-ended questions in the survey. EMS providers identified empathy, time, education, communication skills, experience, and help from others as helpful or necessary in providing patient education. They identified the themes that hinder their ability to educate patients as the need to control the scene, patients in crisis, language and cultural barriers, organizational pressure, and workload. Some of these themes were included in the survey, but others require additional research.

Improving health literacy contributes to improving the patient's outcome, considering that the outcome for each pathology and, invariably, each patient may be unique. The previously noted literature identifies relationships between each component, recognizing other factors also influence the outcome (Alpert et al., 2017; Bohanny et al., 2013; Ishikawa & Yano, 2011). The patient's medical condition, access to proper care,

and social determinants of health significantly impact the outcome of reduced readmission, quality of life, and mortality. In some circumstances, such as with a terminal cancer diagnosis, improved health literacy may result in better end-of-life planning.

For practitioners, the literature reveals the EMS workforce as diverse in the style of learning using Kolb's LSI (Staple et al., 2017). A learning style diverse workforce means EMS educators can use consistent learning models for developing this competency compared to others. However, the demographics of the EMS workforce, as represented in this study is not diverse. The majority of EMS providers are white males. In recent years, the number of females and Hispanics or Latinos has grown significantly; they are still underrepresented when compared to the overall population. This disparity is even greater when considering the demographics of patients who call 911.

The national paramedic curriculum is focused on developing the student's knowledge and skills in identifying the proper emergency medical condition and applying the appropriate treatment (Steeps et al, 2017; Stefurak et al, 2020). While many medical schools and nursing schools directly address the need for patient teaching and education, it is not a primary focus of the EMS curriculum (Williams, 2005).

The need for prehospital non-emergency care has increased due to a lack of resources in the healthcare industry, such as primary care, home health, and social work. One solution in some communities is changing or expanding the role of EMS providers to include non-emergency community patient needs. The term for this role is the community paramedic, which can be an EMR, EMT, paramedic, LPN, or social worker. The

community paramedic role is more developed in Europe and Australia than in the United States. However, in reviewing the community paramedic certification from the International Board of Specialty Certification (ISBC), which holds no official status in the United States, out of 110 test questions, the candidate can expect 21 problems under the category labeled as preventative care and education for the patient or client and caregiver (International Board of Specialty Certification, 2020). This organization represents the development of the EMS profession in many European countries and Australia, which have expanded the role of the EMT to include non-emergent care. The significance in this expansion influences the need to provide teaching and education not only addressed a significant healthcare gap and need from the literature review but has also been identified and included on this certification exam (Schofield et al., 2020).

Limitations of the Study

The study served to compare the relationship between the EMS provider's learning as represented by certification level and years of EMS experience with their perception of the importance and preparedness to deliver patient education. During the course of this study, several limitations were identified.

First, the sample was not randomly selected from the population, resulting in a non-parametric sample and, therefore, not generalizable to the population. In reviewing the demographics of the sample compared to known population demographics, several groups appear significantly underrepresented. Bootstrapping was not used as the responses in these small groups appear homogenous and the researcher had no confidence that it might represent the actual demographic. There is no centralized repository of EMS

providers' contact information available to the researcher. Professional organizations and entities are responsible for maintaining certification records, but these data sources are not public and otherwise directly unavailable to this researcher. Because of this limitation, a convenience sample was used with snowballing. This is a non-parametric sampling method that introduces bias as large groups may be excluded from the study. The researcher attempted to compensate for this by carefully reviewing the data before accepting or rejecting the null hypothesis. For this study, a type 1 error is more preferable than a type 2 error. A type 1 error incorrectly rejects the null hypothesis that, for example, reports that there is no difference in the means. By rejecting this hypothesis, the researcher might incorrectly conclude that additional training is needed when it is not. That is likely more preferable than incorrectly accepting the hypothesis that no training is needed (a type 2 error). This resulted in the sample demographics being different from the known population distributions. In addition, the sample (n=370) was slightly less than the target of 385, resulting in a slightly lower power. A related limitation is the overrepresentation of ALS providers in the study. ALS providers have more education and training and on average, more EMS experience, which impacts any generalizations across the entire sample. This sampling approach also does not allow the researcher to thoroughly assess response bias, which is the nonresponse of someone identified in a prospective sample group. This was partially mitigated by dividing the data into two groups, BLS and ALS, for comparison.

Second, the survey data are self-reported. The CELI tool is used primarily as a competency assessment tool by trained evaluators directly observing participant

behaviors in a simulated or actual clinical environment. This is the first study to convert it into a survey instrument. Additional studies are needed to further improve the validation of this instrument and approach. Related, EMS providers are often placed in extreme, dangerous, and uncontrolled environments, which requires them to have the confidence to handle these situations. This confidence may influence the self-reported scores to be artificially high due to overconfidence or a lack of self-awareness. A related limitation is the use of a Likert scale for measuring the respondent's perceptions. Likert scales are ordinal, with no standard distance between each point. The scale also allows each respondent to interpret each term, such as "very important." Open-ended questions were added to help identify any bias or gaps in the survey, but the majority of respondents only answered the quantitative questions.

Third, analysis of the open-ended question responses revealed nuances and gaps in the 16 practices in the survey that would benefit from additional clarification or discussion. A quantitative study using a cross-sectional survey focuses on testing existing theories and practices. To discover new theories or practices a grounded theory qualitative study is needed. For example, this study didn't capture the type of crew structure of the EMS provider's team. If systems use a 1-tier system with a unit staffed with one EMT and one Paramedic or other ALS provider versus a 2-tier system where EMTs respond in a BLS vehicle and the ALS providers are called to assist only when needed, the relationship and responsibilities may change the role of the EMS providers and influence the results of the survey responses.

Fourth, the influence of the researcher's bias to the EMS providers' role in patient education. The researcher has held an active certification as a paramedic for over 30 years, serving as a provider, supervisor, educator, and preceptor. Most of the clinical experience has been in suburban communities and small cities in Central Pennsylvania. The researcher attempted to maintain objectivity through the development of the survey instrument and analysis of results. While researcher bias is a significant consideration in a qualitative study, it is not completely mitigated with this quantitative study (Creswell & Creswell, 2018).

Recommendations for Future Research

These limitations create opportunities for additional research. As mentioned above, a qualitative grounded theory study using a combination of this survey data and additional interviews would help identify other theories not in the current literature that could then be tested.

Next, additional cross-sectional surveys should focus on obtaining a better sample, possibly focused by organization or region, and include practices and questions identified in the open-ended questions of this survey and any discoveries in other qualitative research.

The actual development of learning opportunities focused on the competencies in EMS providers is a critical part of a program to better educate patients, that is, to have an actual effect. Measuring the impact of the effectiveness of training interventions could be studied by creating experimental and quasi-experimental studies with a focus on the EMS

provider as well as the impact on the health literacy of patients. Using this study, certain competencies, such as explaining and intervening may require more focus and practice.

Finally, a significant opportunity exists for studying aspects of language barriers and cultural differences. Diversity, equity, and inclusion (DEI) is a top initiative in healthcare, as the Joint Commission, which is the primary accrediting organization for hospitals and the Office of Inspector General (OIG) of the United States Department of Health and Human Services (HHS) announce in 2023 that DEI has become a major focus for certification including increased regulatory scrutiny. This includes a requirement for hospitals to have an identified senior executive focused solely on diversity. In this study, of the 16 practices, the lowest-rated practice for both groups was the EMS provider's preparedness to educate patients considering language, cultural, or dialect barriers. The obstacle of language barriers was also the most common issue identified in the open-ended question.

Conclusion

This study investigated the relationship between the certification level and years of experience of an EMS provider and the perception of the importance of educating patients and related preparedness for educating patients. The results showed that most EMS providers consider patient education as important, but those with entry-level certifications (EMR and EMT) feel less prepared than advanced providers. While this may not be surprising, it's important to note that the national curriculum for EMS providers does not include a competency focused on patient education for any level of provider. EMS educators and administrators can use this information to identify

strategies for developing training focused on those competencies for EMS providers with different levels of certification and experience factors. More broadly, the concept of how to develop a teaching competency in non-educators is in question. Across all industries, organizations use subject matter experts and train-the-trainer models to deliver education across their workforce. Leveraging the existing research from those models can inform the development of the patient education competency in EMS providers. Likewise, additional research based on this study might help identify best practices that can be emulated regardless of the industry.

EMS providers' role in healthcare delivery continues to evolve, resulting in potential competency gaps in areas not covered in the standard EMS education curriculum. To underscore this, the Centers for Medicare and Medicaid Services (CMS) began the Emergency Triage, Treat, and Transport (ET3) program on January 1, 2021. This pilot program provides payment for EMS organizations for the treatment and non-transport of patients or transport to facilities not normally recognized by CMS for reimbursement. CMS (Medicare) does not reimburse EMS providers for treating patients without transport to an acute care hospital, skilled nursing facility, critical access hospitals, and dialysis centers. In this pilot model, the EMS provider may be the only healthcare worker the patient encounters, which elevates the importance of their role in patient education. Unfortunately, CMS is ending the ET3 pilot early, as EMS organizations were not submitting enough data for CMS to decide if the pilot could be successful.

Based on this study, a relationship exists between the EMS provider's amount of experiential-based education. While there was also a positive correlation between the years of EMS experience and the perception of the importance and preparedness of educating patients, the strength was low. Statistically, the relationship between other demographic and environmental factors was unmeasurable or inconclusive. However, the qualitative responses identified a significant obstacle of call volume or workload and general agreement that EMS organizations support the concept of their providers educating patients.

The results of the study is that EMS providers who participated feel patient education is important. The difference between how BLS providers perceive their preparedness to educate patients was significant. The past BLS national curriculum does not specifically address many of these practices in their education or certification requirements, while the ALS providers do. The study's implications include additional research focus and awareness of EMS administrators, educators, and FTOs to assess the structure and design of EMS service structure, support, and staffing. EMS Educators, similar to other career and technical educators, must design a change process leveraging key leadership skills, including self-responsibility, coaching, and written communication (Fleck et al., 2019). For some assignments, this level of BLS provider preparedness may be satisfactory, while in other instances, it may not.

Finally, the EMS system, similar to the entire healthcare industry, is under extreme financial pressures and a declining workforce. The post-Covid impact on the EMS industry has exacerbated the economic and resource pressure on the system. The

opioid epidemic also continues to contribute to straining EMS resources (Trebach et al., 2021). The increasing demand for staff, combined with the decrease in people interested in EMS as a career, and an increase in demand via 911 calls, has caused a significant resource gap. EMS providers are increasingly leaving the profession since the onset of the pandemic, with a decrease in enrollment of new EMS students. This study shows that most EMS providers consider educating patients as important. For an industry in distress, the aspect of adding another program for another competency may seem daunting to EMS providers. If you ask those same providers to discuss examples of preventable 911 calls that occurred due to the patient or caretaker lacking an understanding of their medical condition; sit down, and you'll be there awhile.

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Appendix A: CELI Instrument from CanMEDS

<u>C = Control and rapport</u>	Poor	Inadequate	Adequate	Good	n/a
a clear and friendly completion of the consultation	-2	-1	1	2	0
agreement upon the goal and subjects of the consultation	-2	-1	1	2	0
announcing and explaining activities, such as physical examination or writing	-2	-1	1	2	0
control of attention and participation when more than one interlocutor is present	-2	-1	1	2	0
control of patient's attention to the conversation	-2	-1	1	2	0
extensive summary when changing to a new subject or closing the consultation	-2	-1	1	2	0
general verbal and nonverbal presentation of genuineness, empathy, care and competence	-2	-1	1	2	0
guiding the course of the conversation, keeping the prescribed conversational structure	-2	-1	1	2	0
invitational start of the consultation	-2	-1	1	2	0
reinforcement of patient behaviour which benefits the conversation and relationship	-2	-1	1	2	0
social conversation in order to show interest in the patient and put the patient at ease	-2	-1	1	2	0
summary of the foregoing (resume)	-2	-1	1	2	0
<u>E = Explaining</u>					
comprehension checks	-2	-1	1	2	0
concise and structured with an introduction, paragraphs and short summaries	-2	-1	1	2	0
convincing, vivid with appealing examples, referring to patients' experiences	-2	-1	1	2	0
fitting in to the frame of reference of the patient	-2	-1	1	2	0
interactive with pauses for reaction, dosed, guided by response emotional or other	-2	-1	1	2	0
repetition and support with visual aids	-2	-1	1	2	0
true in contents, realistic	-2	-1	1	2	0
use of clear and comprehensible language (choice of words, short sentences)	-2	-1	1	2	0
<u>L = Active listening</u>					
acquiring relevant information	-2	-1	1	2	0
asking correct open and closed questions to elicit facts, feelings and opinions	-2	-1	1	2	0
concretizing	-2	-1	1	2	0
paraphrasing	-2	-1	1	2	0
reflection of feelings and opinions	-2	-1	1	2	0
shading and confronting	-2	-1	1	2	0
summarizing the patient's story	-2	-1	1	2	0
use of silence	-2	-1	1	2	0
verbal and nonverbal attending behaviour, minimal encourages to talk	-2	-1	1	2	0
<u>I = Influencing</u>					
checks of approval of suggestions, instructions, advice, decisions and agreements	-2	-1	1	2	0
constructive negotiation	-2	-1	1	2	0
counselling, assisting with difficult decisions	-2	-1	1	2	0
making clear agreements and contingency plans	-2	-1	1	2	0
offering educational material (leaflets, internet) and/or useful contact addresses	-2	-1	1	2	0
offering personal support or professional help after the consultation	-2	-1	1	2	0
offering suggestions (and no orders), leaving room for contemplation	-2	-1	1	2	0
phasing the decision process, offering time for contemplation	-2	-1	1	2	0
promoting the mutual acknowledgement of feelings and opinions	-2	-1	1	2	0
realistic presentation of advice, possibilities, promises and limitations	-2	-1	1	2	0
reinforcement of patient problem-solving behaviour	-2	-1	1	2	0
rephrasing a problem into a shared problem	-2	-1	1	2	0
taking into account the 'bad news' nature of some information and advice	-2	-1	1	2	0
useful and acceptable phrasing of instructions and advice	-2	-1	1	2	0

Appendix B: Survey

Healthcare Provider's Role in Patient Education Implied Informed Consent

This survey is a component of a doctoral dissertation exploring attitudes, behaviors, and preferences of emergency medical services professionals' perspectives on their role in patient education. No part of this survey may be replicated without the written permission and consent of the researcher.

Survey Participation

- Your participation is voluntary.
- Your identity and responses will remain anonymous.
- Completion of this survey implies that you have read and understood the instructions and consent to participate in this research. You may withdraw at any time.
- You may choose not to answer every question.
- To participate, you must be at least 18 years old and have experience working or volunteering as a practitioner in an emergency medical services role.

Confidentiality Statement: There is a risk of loss of confidentiality if your demographic information is obtained by someone other than the investigators, but precautions will be taken to prevent this from happening. The confidentiality of your electronic data created by you or by the researchers will be maintained as required by applicable law and to the degree permitted by the technology used. Absolute confidentiality cannot be guaranteed.

Instructions

- It takes about 10 minutes to complete this survey.
- If you choose to stop participating at any time during the survey, just close out of the survey. Your responses will not be saved.
- **If using a mobile device, it is easier to read if you rotate your phone to landscape view.**

Contact Troy Phillips at tap146@psu.edu with questions or to report any concerns about this study.

1. How many years of experience do you have in any full-time, part-time, or volunteer capacity in a provider role in emergency medical service? _____
2. What is your current age? _____
3. Which gender do you identify with?
 - Female
 - Male
 - Non-Binary
 - Prefer not to answer
4. Which of the following best describes you?
 - Asian or Pacific Islander
 - Black or African American
 - Hispanic or Latino
 - Native American or Alaskan Native
 - White or Caucasian
 - Multiracial or Biracial
 - A race/ethnicity not listed
 - Prefer not to answer
5. Which best represents your certification or license?
 - Never certified, licensed, or registered
 - EMR - Emergency Medical Responder
 - EMT - Emergency Medical Technician
 - AEMT or EMT I – Advanced or Intermediate EMT
 - EMTP or NRP – Paramedic
 - PHRN, MD, DO - Prehospital Nurse or Physician
 - Other (7)
6. Which best represents the community demographics you support(ed) for the majority of your experience?
 - Rural or small community (less than 25,000 people)
 - Medium to Large community (25,001 – 150,000 people)
 - Mid-sized City (150,001 – 500,000 people)
 - Large City (over 500,000 people)
 - Suburban area outside a Mid-sized or Large city
 - Other not listed (Examples: Military base, Industrial, Other governmental,)
7. Which best describes the type of organization where you provide(d) the majority of your EMS work?
 - Fire-Based service (Municipal or Independent)

- Hospital-based EMS
- Private, For-profit organization
- Private, Not-for-profit organization
- Municipal, County, or other Governmental EMS Service (non-fire based)
- Educational Institution
- Other or no affiliation

8. On average, estimate how many patients you care for in a typical week? (Consider all patient contacts regardless of the setting: 911, routine transport, community paramedicine, emergency department, etc.). _____

Section 2: Patient Education Practices This section has 16 statements. Each statement requires 2 responses.

First, record how **IMPORTANT** you believe it is for EMS providers to perform/deliver.

1 = Unimportant

2 = Generally unimportant

3 = Neither important nor unimportant, or no opinion

4 = Usually Important,

5 = Extremely Important

Second, record how **PREPARED** you feel to perform the task based on your training and experience.

1 = Not prepared or should not be done

2 = Minimally prepared

3 = Somewhat prepared

4 = Well prepared

For the purpose of this survey, assume the patient or caregiver is alert and the scene is safe unless otherwise stated.

Controlling	How IMPORTANT to do?	How PREPARED do you feel?
1. Introduce or announce yourself.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
2. Keep the patient or caregiver's attention focused.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
3. Show empathy, care, or compassion.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
4. Explain what you are about to do before doing it, such as applying a blood pressure cuff or starting an IV.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared

Explaining	How IMPORTANT to do?	How PREPARED do you feel?
<p>1. Be truthful and clear when explaining medical terms and treatment.</p> <p>2. Consider language, culture, or dialect barriers.</p> <p>3. Verify the patient understands the care and treatment plan.</p> <p>4. Use examples to explain the pathology or treatment to the patient.</p>	<p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p>	<p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p>
Listening	How IMPORTANT to do?	How PREPARED do you feel?
<p>1. Repeat back or paraphrase the patient's statement.</p> <p>2. Give the patient an opportunity to explain or clarify their statements.</p> <p>3. If the patient is unclear, ask for the same information several different ways.</p> <p>4. Address non-verbal cues indicating the patient may be unable or unwilling to verbalize their concerns.</p>	<p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p> <p>▼ 1 = Unimportant... 5 = Extremely Important</p>	<p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p> <p>▼ 1 = Not Prepared ... 4 = Well Prepared</p>

Influencing	How IMPORTANT to do?	How PREPARED do you feel?
1. Provide realistic possibilities when refusing recommended treatment or transport.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
2. Discuss treatment and/or transport options if the patient initially declines but you feel further care or transport is needed.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
3. Use plain, direct language if delivering unwelcomed or 'bad news'.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared
4. Use additional resources to help the patient's understanding of their options.	▼ 1 = Unimportant... 5 = Extremely Important	▼ 1 = Not Prepared ... 4 = Well Prepared

Section 3: Environmental Factors

Assess how much the following 5 statements might impact the EMS provider's ability to provide patient education.

Please answer the following questions using the following 5-point scale:

- 1=strongly disagree,
- 2=disagree,
- 3=neither agree nor disagree,
- 4=agree,
- 5=strongly agree.

	Response
1. My organization supports EMS providers in taking the time necessary to provide patient education.	▼ 1 = Strongly disagree ... 5 = Strongly agree
2. In a typical day, high call volume and work assignments make it difficult to provide patient education.	▼ 1 = Strongly disagree ... 5 = Strongly agree
3. EMS providers have a responsibility to educate patients about their medical condition.	▼ 1 = Strongly disagree ... 5 = Strongly agree
4. I would consider attending more training on developing my ability to educate patients.	▼ 1 = Strongly disagree ... 5 = Strongly agree
5. Taking this survey changed my thinking or increased my awareness about delivering patient education.	▼ 1 = Strongly disagree ... 5 = Strongly agree

[Optional] Think about a time when you provided education to a patient. What aspects of your education or experience helped you do that?

[Optional] Think about a time when you were hindered from providing patient education. What limited your ability to do that?

Thank you for completing this survey!

Appendix C: Individual Message

Hello <name>

I am conducting a survey of EMS providers and I was hoping you could help me out. Below is an electronic flyer and link to the short survey focused on educating patients. It should only take about 10-12 minutes to complete and is anonymous. Please feel free to forward to your colleagues. If you are in a leadership position, please make it clear that completing this survey is not required for employment nor will you even find out if they completed it.

This survey also supports research for my doctoral paper. So, I'd appreciate your help! If you have any questions, please feel free to email me at: tap146@psu.edu.

Thanks,

Troy Phillips

<attach IRB approved flyer>

<attach link to the survey in Qualtrics>

Appendix D: Survey Flyer

Em

Complete this short survey on your experience providing patient education in the prehospital setting.

Seeking current and former EMS providers to complete a short survey on their role in delivering patient education in the prehospital environment.

You Qualify If You

- Are 18 or older
- Have provided prehospital care as an EMS provider at any certification level.

Research Purpose

By participating in this survey, you are helping identify the role of EMS providers in patient education.

This study is also integral in the completion of my doctoral dissertation. I appreciate your help!

Participation Involves

- Answering multiple choice question and two optional free text questions.
- The survey is based on a tool developed to assess the patient education competency of physicians.
- Participation is anonymous

Location:

https://pennstate.qualtrics.com/jfe/form/SV_7UQBVf2qVADKQn4

FOR MORE INFORMATION

Please contact Troy A. Phillips, MHA, EMT-P, at tap146@psu.edu

Appendix E: IRB Determination



Office for Research Protections
 Human Research Protection Program
 Office of The Senior Vice President for Research
 The Pennsylvania State University
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EXEMPTION DETERMINATION

Date: March 2, 2023

From: Brittany Wickham, IRB Analyst

To: Troy Phillips

Type of Submission:	Initial Study
Title of Study:	THE PATIENT EDUCATION COMPETENCE IN THE EMERGENCY MEDICAL SERVICE WORKFORCE: A CROSS-SECTIONAL SURVEY OF PERSPECTIVES AND ATTITUDES
Principal Investigator:	Troy Phillips
Study ID:	STUDY00022194
Submission ID:	STUDY00022194
Funding:	Not Applicable
Documents Approved:	<ul style="list-style-type: none"> • tphillips Diss Survey (26), Category: Data Collection Instrument • Tphillips Dissertation EMS Providers Patient Education (2), Category: IRB Protocol

The Office for Research Protections determined that the proposed activity, as described in the above-referenced submission, does not require formal IRB review because the research met the criteria for exempt research according to the policies of this institution and the provisions of applicable federal regulations.

Continuing Progress Reports are **not** required for exempt research. You must notify the IRB when the exempt research study is closed/completed by completing a continuing review in CATS IRB.

Changes to exempt research only need to be submitted to the Office for Research Protections in limited circumstances described in the below-referenced Investigator Manual. If changes are being considered and there are questions about whether IRB review is needed, please contact the Office for Research Protections.

Investigators are required to follow the requirements listed in the [HRP-103](#) – Investigator Manual, which can be found by navigating to the IRB Library within CATS IRB (<http://irb.psu.edu>).

VITA

Troy A. Phillips

Experience

Pennsylvania State University , University Park, PA <u>Assistant Teaching Professor, Dept. of Health Policy and Admin.</u>	1/24 – present
OSS Health , York, PA, <u>Chief Executive Officer</u>	9/21 – 9/23
Cerner Corporation , Kansas City, MO, <u>Sr Director, Revenue Cycle</u>	9/11 – 9/21
Penn State University , University Park, PA <u>Adjunct Instructor, Health Policy and Administration</u>	8/16 – 5/21
Lebanon Valley College , Annville, PA, <u>Adjunct Instructor, MBA Program</u>	8/10 – 5/18
Penn State Hershey Medical Center , Hershey, PA. <u>Director, Revenue Cycle</u>	7/01 – 11/10

Education

Ph.D. Candidate – Workforce Education. Penn State University, University Park, PA. (current)

Master of Healthcare Administration (MHA). Penn State University, Harrisburg, PA. 2001

Bachelor of Science, Accounting. Elizabethtown College, Elizabethtown, PA. 1991

Select Publications

- Abdulahad, D., Ekpa, N., Baker, E., Foley, K. A., Fogel, B., Phillips, T. A., & Levi, B. (2020). Being a medical scribe: Good preparation for becoming a doctor. *Medical Science Educator*, 30, 569-572. <https://doi.org/10.1007/s40670-020-00937-w>
- Jhaveri, P., Abdulahad, D., Fogel, B., Chuang, C., Lehman, E., Chawla, L., Foley, K., Phillips, T., & Levi, B. (2022). Impact of Scribe Intervention on Documentation in an Outpatient Pediatric Primary Care Practice. *Academic Pediatrics*, 22(2), 289–295. <https://doi.org/10.1016/j.acap.2021.05.004>
- Paul, I. A., Phillips, T. A., Widome, M. D., and Hollenbeak, C. S. (2004). Cost-Effectiveness of postnatal home nursing visits for prevention of hospital care for jaundice and dehydration, *Journal of Pediatrics*, 114 (4), 1015-1022.
- Phillips, T. A. (2018). *Teaching physicians how to teach*. Research presented at the Association for Career and Technical Education in Research conference, San Antonio, TX.
- Phillips, T. A., Foley, K. A., Levi, B. H., Jhaveri, P., Chuang, C. H., Abdulahad, D., Lehman, E., Fogel, B. H. (2021). The impact of medical scribes on relative value units in a pediatric primary care practice. *Academic Pediatrics*, 21(3), 542-547. <https://doi.org/10.1016/j.acap.2020.05.009>