2014

Pharmacists' Preparedness For Acute Medical Emergencies

James W. Parrett
University of Mississippi

PHARMACISTS' PREPAREDNESS FOR ACUTE MEDICAL EMERGENCIES

A Thesis presented in partial fulfillment of the requirements
for the degree of Master of Science in the
Department of Pharmacy Administration, The University of Mississippi

By

James W. Parrett, Jr., Esq.

May 2014

ABSTRACT

Purpose/Objectives

This project studied how prepared community pharmacists are to respond to acute medical emergencies, as well as their perceived efficacy in addressing these situations. Specifically, it considered what training pharmacists have for responding to medical emergencies, what emergency medical equipment pharmacies have on-hand, the frequency that medical emergencies occur within pharmacies, and the types of emergencies encountered. It also measured self and collective efficacy of pharmacists in responding to medical emergencies within their pharmacy to determine if differences in self-efficacy or collective efficacy exist.

Methods

This study utilized a cross-sectional, non-experimental, descriptive design via a self-administered, Internet-based survey distributed through email to a national sample of community pharmacists assembled by Delta Marketing Dynamics Healthcare Research. Responses yielded 393 usable completed surveys. Measures were created for demographic characteristics of respondent community pharmacists and questions concerning the training received by community pharmacists and others working within the pharmacy, the frequency with which such emergencies occur within the community setting, as well as their level of preparedness and emergency equipment available for addressing acute medical emergencies. Two scales were developed including a sixteen item scale to assess pharmacists' self-efficacy and a thirteen item scale to assess pharmacists' collective efficacy views for responding to medical emergencies.

PCA was conducted to determine the factors affecting either self or collective efficacy, which comprised two components for each scale of BLS-related and non-BLS related skills. MANOVA was used to determine whether differences exist between pharmacists' self and collective efficacy and their practice location, type of practice, position and prior experience.

Results/Discussion

Most pharmacists reported training in CPR at some point in their career, although approximately half had current certifications for CPR/BLS. Common emergency equipment available were items that would be expected in a pharmacy (e.g. gloves, Epi Pens, Glucagon kits). Although a majority of pharmacies had a first aid kit of available, less than 10% had access to an AED. MANOVA results showed significant differences between location of practice for the self efficacy non-BLS component and both collective efficacy components, type of practice for the BLS-skills component, and prior CPR experience for non-BLS skills component.

DEDICATION

This thesis is dedicated to my wife, Dr. Carrie Veronica Smith, for her encouragement, support and patience with my academic pursuits.

LIST OF ABBREVIATIONS

ANOVA	analysis of variance
ACLS	advanced cardiac life support
AED	automatic external defibrillator
AHA	American Heart Association
ASHP	American Society of Health-System Pharmacists
BLS	basic life support
CPR	cardiopulmonary resuscitation
DOT	Department of Transportation
ED	emergency department
EMR	emergency medical responder
EMS	emergency medical services
EMT	emergency medical technician
PALS	pediatric advanced life support
PCA	principal component analysis
MANOVA	multivariate analysis of variance
NHTSA	National Highway Transportation Safety Administration
OSHA	Occupational Safety and Health Administration

ACKNOWLEDGEMENTS

I would like to thank my thesis advisor, Dr. Erin Holmes, for her assistance and advice with this project. It would not have been possible without her. I am also grateful to the members of my committee, Dr. David J. McCaffrey III, Dr. Yi Yang, and Dr. Stephan Schulenberg, for their valuable comments and suggestions.

I would like to thank Patty Trainor, Kathy Nisewicz and Rich Maitland of Delta Marketing Dynamics Healthcare Research for allowing me to use their panel of community pharmacists for this project. I am truly indebted to them for their assistance with this project.

I would like to thank Dr. West-Strum for her assistance with this project, particularly in allowing me to pursue a graduate degree while also attending school as a full-time professional pharmacy student. I am grateful for the unique opportunity that I was given, and I hope it will open doors for others in the future.

I would like to acknowledge Dr. John Bentley for his advice and mentorship through this process. He has always been willing to hear my thoughts and serve as confidant when needed. I would also like to acknowledge the other members of the Department of Pharmacy Administration, particularly the graduate students, for their encouragement and support.

Finally, I would like to thank my wife, Dr. Carrie Smith, for her assistance and patience with this project. She was always there when I needed her to offer a suggestion, point me in the right direction, or keep me moving forward.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Medical emergencies can occur anywhere, even your friendly neighborhood pharmacy. Consider, for instance, the case of Colton Hendrix. On one Sunday morning, baby Colton was running a 104 degree fever that his mother Kaitlyn could not bring down. She took Colton to the emergency room to be treated. On the way home, she stopped at her local CVS pharmacy to fill a prescription. While there, a customer noticed that her baby was not breathing and was turning blue. Fortunately, the pharmacist came from behind the counter and took the baby from the distraught mother. The pharmacist started cardiopulmonary resuscitation (CPR) and rescue breathing for the infant. After two terrifying minutes, Colton finally took a breath. Emergency medical services arrived shortly thereafter, where they took Colton to the hospital. He was diagnosed with having a virus that caused a febrile seizure, for which those viruses are known for rapidly rising temperatures that can cause children to stop breathing. Fortunately in this case, the Hendrixes were at the pharmacy when this occurred and their pharmacist was trained in CPR and knew how to respond to the emergency situation, saving young Colton's life (Brown, 2011).

Pharmacists are often seen as first-line health care providers and a point of access for many people to the healthcare system. Pharmacists' roles have evolved over the past few decades from simply compounding and dispensing medications to actively screening and assessing health conditions, such as diabetes and hypertension, as well as counseling patients on medication usage. Pharmacists have also been trained increasingly in emergency life-saving interventions such as CPR and basic life support.

Pharmacies in particular may be locations where medical emergencies are prone to occur. This is likely when considering that the majority of people going to a pharmacy are doing so because they have some medical condition for which they are seeking pharmaceutical treatment. A number of treatable chronic illnesses for which patients seek pharmaceutical intervention, for example asthma and heart disease, can lead to acute medical emergencies.

Pharmacists' response to medical emergencies, however, is an understudied area. Several papers have considered the pharmacist's role in responding to medical emergencies in institutions, such as hospitals, as part of a code blue or CPR team (Toma et al., 2007; Hanefeld et al., 2005; Shimp et al., 1995; Machado et al., 2003). Other papers have considered the pharmacist's role in responding to widespread disasters such as bioterrorism (Setlak, 2004; Pedersen et al., 2003; Woodard et al., 2010). Pharmacist intervention in acute medical emergencies outside of the hospital, however, has not been researched.

A number of different specialized trainings exist for dealing with acute medical emergencies. The most common training is CPR, which is taught to both laypersons and healthcare providers. Other training can include more advanced forms of CPR specializing in adult and pediatric rescue. Emergency medical training, such as that received by emergency medical technicians (EMTs) and paramedics, is also available for those individuals responding to medical emergencies outside the healthcare institution.

At first glance it may appear that pharmacists do not have much training relevant to addressing medical emergencies. Pharmacists are primarily trained to address chronic medical conditions or acute infectious diseases through medication therapy. Common medical emergencies include heart attacks (e.g. acute myocardial infarction), difficulty breathing (e.g. asthma attack) or trauma. Outside of a basic life support class, pharmacists are typically not

trained to deal with these sorts of emergencies. However, treatment of medical emergencies, at least at a high level of provider skill, frequently involves the use of medications given in the field. Here pharmacists, with their advanced pharmaceutical training, are in a position to contribute a great deal during a medical emergency.

STUDY OBJECTIVES

This study seeks to determine how prepared community pharmacists are to respond to acute medical emergencies that present within their place of work, as well as their confidence to intervene in these situations. Specifically, it will address the following three objectives:

1. To determine pharmacists' preparedness in addressing acute medical emergencies, including what training, if any, pharmacists have for responding to medical emergencies, what sorts of equipment pharmacies have on-hand for responding to medical emergencies, the frequency with which medical emergencies occur in pharmacies, and the types of medical emergencies pharmacists encounter.
2. To develop new scales to measure self-efficacy and collective efficacy of pharmacists in responding to medical emergencies that may occur within their pharmacy.
3. To determine if differences in emergency preparedness, self-efficacy and collective efficacy exist among pharmacists.

BACKGROUND AND LITERATURE REVIEW

Cardiopulmonary Resuscitation (CPR) and Basic Life Support (BLS)

Types of CPR Training

CPR classes are generally taught by instructors from the American Heart Association (AHA) or the American Red Cross. The American Red Cross class follows Occupational Safety and Health Administration (OSHA) guidelines and covers adult and child/infant CPR, basic first aid and operation of automatic external defibrillators (AEDs) (American Red Cross, 2013). The American Red Cross also offers a few additional programs for healthcare providers such as firefighters and EMTs including classes on administering oxygen, bloodborne pathogens, and emergency medical response covering assessment, airway and ventilation and emergency medical services (EMS) operations.

The AHA generally offers more extensive training than the American Red Cross. Like the American Red Cross, the AHA offers a number of CPR courses. For the workplace and lay persons in the community, the AHA offers courses under its Heartsaver® and Friends and Family® programs (American Heart Association, Heartsaver® 2014; American Heart Association, Friends and Family, 2014). For healthcare providers, the AHA offers an introductory CPR course that it calls Basic Life Support (BLS) (American Heart Association, BLS, 2014) BLS teaches basic CPR, using an AED, how to relieve choking and activating the EMS system. A BLS course takes approximately four and one-half hours to complete

The AHA also offers several advanced training courses for healthcare providers that build upon the skills taught in BLS. The most common are Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support (PALS). ACLS is intended for healthcare professionals "who either direct or participate in the management of cardiopulmonary arrest and other cardiovascular emergencies," including "personnel in emergency response, emergency medicine, intensive care and critical care units." (American Heart Association, ACLS 2014). The program focuses on adult emergencies and includes advanced airway management, recognition and management of acute cardiac situations, and related pharmacology. The ACLS course takes approximately 10-12 hours to complete. PALS is similar to ACLS and intended for the same audience, but focuses instead on children and infants (American Heart Association, PALS 2014). The full course takes 14 hours and 10 minutes, excluding lunch and breaks.

CPR/BLS Requirements for Pharmacists

CPR and BLS training is generally required of all pharmacy students. In 2002, McCall and Supernaw surveyed the American Association of Colleges of Pharmacy (AACP) pharmacy schools and found that 93 percent of the responding schools required BLS training (McCall and Supernaw, 2002). The particular level of BLS training required by schools varied between healthcare provider and layperson courses, although the healthcare provider courses were more common (65 percent). Instruction was primarily provided by outside instructors from either the American Heart Association or the American Red Cross. When pharmacy students were trained also varied between institutions, with some requiring training before entry into the Doctor of Pharmacy (Pharm.D.) program whereas others required it later in the program, likely before the start of clinical practice. McCall and Supernaw also emphasized the need for pharmacists to be trained in CPR as:

> Although pharmacy practices vary greatly, it is probable that a pharmacist may encounter a victim in cardiopulmonary arrest in almost every pharmacy setting. The pharmacist may be a lone rescuer or a member of a CPR team. Regardless, the pharmacist should be adequately trained with the knowledge and skills of BLS in order to save a victim's life.

Unlike pharmacy schools, in general, the various state boards of pharmacy do not require that pharmacists maintain CPR/BLS certification in order to renew their licenses. That result may appear surprising given the recognized importance of CPR/BLS skills to healthcare providers, but is likely reluctance on the part of state governments to codify programs regulated by non-governmental entities. Thus, it is entirely possible that many pharmacists do not maintain their CPR certifications that they received in school unless some other entity requires them to do so (e.g. an employer).

Institutional pharmacists, however, may be required to maintain their CPR/BLS certifications by their institution. This may be for several reasons. First, it may be required for purposes of accreditation by review agencies such as the Joint Commission. Second, there is a growing expectation for clinical pharmacists to participate in emergency medicine at their institutions. Although the percentage of hospitals that have dedicated pharmacists in the emergency department is still very low (approximately 3%) (Fairbanks et al., 2004), the American Society of Health-System Pharmacists (ASHP) has issued a policy statement that "every hospital pharmacy department should provide its emergency department (ED) with the pharmacy services that are necessary for safe and effective patient care." (ASHP, 2007) According to the ASHP, those services include pharmacists participating in resuscitation efforts. Clinical pharmacists participating in the emergency department provide numerous valuable services, including responding to medical emergencies, providing consultations, conducting medication histories and reducing medication errors (Cohen et al., 2009). The ASHP recommends that emergency medicine pharmacists should seek out training and certifications

applicable to their practice setting, including the AHA's BLS, ACLS and PALS. The ASHP noted that "[a]t a minimum, all [emergency medical providers] EMPs should achieve and maintain up-to-date certification in BLS, ACLS and PALS" (ASHP, 2011). Likewise, Fairbanks et al. in studying an emergency pharmacist program noted that the minimum required education includes ACLS and PALS training (Fairbanks et al., 2008). Pharmacy residents at academic medical centers are also increasingly participating in emergency department events. A 2011 study found that the majority of residents (89%) participated in CPR events, with a similar percentage reporting that their participation was required (Del Monte and Clark, 2011). Pharmacy residents overall, however, were not satisfied with their level of training and thought that additional training was needed.

Another recent change that may affect practicing pharmacists obtaining and maintaining their CPR/BLS certifications is the administration of vaccines by pharmacists. Pharmacists now can administer vaccines in all fifty states under various immunization protocols developed by the states (Immunization Action Coalition, 2009). In general, these protocols require that pharmacists have CPR training and equipment on hand in case of anaphylaxis or an adverse event. For example, the Oregon Health Authority requires that "[a]ll pharmacists should have 'basic knowledge' in how to recognize and initiate 'first-aid' treatment of anaphylaxis. They should hold current CPR certification" (Oregon Health Authority, 2010). Thus, it is expected that many independent and community pharmacists, where administering vaccines has become an increasing part of their business, will be trained in CPR/BLS even though it is not a requirement for state licensure (Jaspen, 2013).

Although the requirement of CPR training for pharmacy students has been studied by McCall and Supernaw, it appears that the extent of CPR training of practicing pharmacists in

various settings has not been investigated. This survey will attempt to assess the extent to which practicing pharmacists are trained in CPR/BLS, what level of training they maintain if any, and whether their employers require this training or if the pharmacist maintains their training of their own volition.

Emergency Medical Services

History of Emergency Medical Services in the United States

In the field of medicine, the licensed and certified emergency healthcare provider is a relatively recent phenomenon dating back to the late 1960's. In 1966, the National Academy of Sciences – National Research Council published a white paper entitled "Accidental Death and Disability: The Neglected Disease of Modern Society" (National Academy of Sciences, 1966). Commonly referred to as the "EMS White Paper," that landmark publication was the first paper to assess how emergency services were provided in the nation. The paper reported that in 1965, "52 million accidental injuries killed 107,000, temporarily disabled over 10 million and permanently impaired 400,000 American citizens at a cost of approximately $18 billion [in 1965 dollars]." Accidents were identified as "the leading cause of death among persons between the ages of 1 and 37; and they are the fourth leading cause of death at all ages." The paper also identified a number of areas that needed to be addressed. For instance, the paper observed that "[a]pproximately 50 percent of the country's ambulance services are provided by 12,000 morticians, mainly because their vehicles can accommodate transportation on litters." Many privately owned ambulances were found to be unsuitable for active care during transport. The EMS White Paper also identified a need for training of EMS personnel as "[t]here are no generally accepted standards for competence or training of ambulance attendants."

In response to the needs recognized by the EMS White Paper, Congress passed the Highway Safety Act of 1966, which among other things, created the new Department of Transportation (DOT). Among other responsibilities, the DOT had authority to improve emergency medical services by creating guidelines for EMS providers and providing funding for regional EMS programs to be developed. The first national curriculum for emergency medical technicians was published in 1971, creating the Emergency Medical Technician – Ambulance (EMT-A). A curriculum for paramedics who could provide advanced care followed shortly thereafter.

In 1973, Congress provided additional funding to develop regional EMS programs using federal guidelines under the Emergency Medical Services Systems Act. However, that funding was ended with the 1981 Omnibus Budget Reconciliation Act where the federal government changed its policy of directly funding EMS programs to instead providing block grants to the states. This led to the states taking greater control over the regional EMS programs. To this date, this is the model by which the federal government provides EMS funding.

Thirty years later the DOT revisited the state of EMS services and outlined its expectations for future practice with its publication *Emergency Medical Services Agenda for the Future*, commonly referred to as the "Agenda" (National Highway Traffic Safety Administration, 1996). This document laid new groundwork for a modern EMS system.

Types of Emergency Medical Providers

There are several levels of training for EMTs, each of which allows the EMT to provide different medical interventions.

Emergency Medical Responders (First Responders)

Emergency Medical Responders (EMR), previously known as First Responders, are individuals who are trained to arrive at the scene of a medical emergency, but who are not

trained for transporting patients to the hospital. The EMR curriculum, like all of the emergency medical technician curriculums, is set by the DOT. EMRs are individuals who "possess the basic knowledge and skills necessary to provide lifesaving interventions while awaiting EMS response and to assist higher level personnel at the scene and during transport" (National Highway Traffic Safety Administration, 2007). Although capable of helping in an emergency situation, Emergency Medical Responders receive the least training of any of the EMS programs. EMRs provide very basic medical interventions using minimal equipment they may have on-hand. Historically firefighters and police officers were common recipients of this level of training, but the modern trend is for EMT-B training.

Emergency Medical Technician – Basic (EMT-B)

Emergency medical technicians are the primary healthcare providers for emergency care outside of the hospital setting. The emergency medical technician curriculum was developed by Dunlap and Associates for the National Highway Transportation and Safety Board and published in 1971 following the requirements set forth in the 1966 Highway Safety Act. This new provider was termed the Emergency Medical Technician – Ambulance (EMT-A), and was meant to be a basic level emergency medical provider (National Highway Traffic Safety Administration, 2000). The EMT-A curriculum was revised by the NHTSA in 1984, primarily raising the number of required hours from 81 to 110.

EMT-B is the current entry level training program for emergency medical technicians. The B-level is an evolution from the original EMT-A training first published in 1969 and subsequently revised in the 1984. In the early 1990s, the National Highway Transportation Safety Administration (NHTSA) recognized the need to look comprehensively at the future of EMS education and convened the Consensus Workshop on Emergency Medical Services Training Programs. In 1993 that consensus process resulted in the *National EMS Education and*

Practice Blueprint (commonly referred to as the "*Blueprint*"), which sought to define the various levels of EMS providers, nationally recognize their scope of practice, and provide a framework for future curriculum development and a standardized pathway for states to deal with legal recognition and reciprocity (National Highway Traffic Safety Administration, 2000).

In accordance with the *Blueprint*, in 1994 the EMT-A program was substantially revised and rebranded as the new EMT-B (Basic) program. The number of required hours remained constant, although the focus of the EMT training shifted from diagnosis-based to assessment-based. New EMT-Bs were also able to administer several medications if the patient had them on hand (e.g. epinephrine pins or nitroglycerin tablets), as well medications that were part of their EMS equipment (e.g. dextrose, oxygen, activated charcoal). The focus of the EMT, however, is still "to provide basic emergency medical care and transportation for critical and emergent patients" and to "perform interventions with the basic equipment typically found on an ambulance" (National Highway Traffic Safety Administration, 2007) Today, many firefighters and some police officers have EMT-B training. Professional EMTs are often required to have higher levels of training, although the EMT-B program is frequently a prerequisite to the training.

Emergency Medical Technician – Paramedic (EMT-P)

The EMT-P, frequently referred to simply as a "paramedic," is the highest level of EMT that is available in most jurisdictions. Paramedics provide advanced care to patients, using interventions such as manual cardiac defibrillators, airway intubation and IV medications.

Paramedics require significant training, with courses lasting several months to two years. Paramedic classes are primarily taught by community colleges and are frequently offered as associate degrees, although some colleges offer 4-year degrees for paramedics.

Advanced Emergency Medical Technician (AEMT)

A number of states also recognize an intermediate level of EMT between the entry-level EMT-B and the advanced level paramedic EMT-P. These intermediate level practitioners were originally referred to as EMT-Intermediate (EMT-I). The EMT-I provided some advanced medical care over what the EMT-A could, primarily in terms of IV drug medications and airway interventions such as intubation.

EMT-I started in the mid-1980s, but was later revised (along with the EMT-P curriculum) in 1998, leading to a somewhat different level of practice that was referred to as the EMT-Intermediate-99 (with the previous curriculum referred to as EMT-Intermediate-85). Further revisions to the curriculum in the mid-2000s led to the renaming of the EMT-I as the Advanced Emergency Medical Technician (AEMT). The role of the AEMT is consistent with that of the prior EMT-I, to "perform interventions with the basic and advanced equipment typically found on an ambulance" (National Highway Traffic Safety Administration, 2007).

Licensure and Certification of Emergency Medical Technicians

Like the practice of pharmacy, the ability to practice emergency medicine is regulated at the state-level. States issue licenses to practitioners that allow them to practice emergency medicine within their jurisdiction. There is not a "national licensure" of EMTs, so EMTs that leave the jurisdictions in which they are licensed are limited to acting as Good Samaritans (although they will still have a much higher level of training for responding to the situation, which may be reflected in their legal duty to the patient if they do respond to an emergency outside their licensed area).

Although EMTs are regulated by the individual states, there is a private organization that certifies EMT training on a national level. The National Registry of Emergency Medical Technicians offers certification exams for each level of EMT training. Note that certification is

different than licensure in that licenses to practice can only be issued by a government. Certification does not give the right to practice, but instead is a representation from a non-governmental institution that the person is sufficiently qualified to practice. In the case of nationally registered EMTs, however, many states recognize that certification for purposes of obtaining licensure.

Pharmacists as Emergency Medical Providers

Very little has been studied concerning the pharmacist's role in medical emergencies. To date, no research has been located describing the sorts of medical emergencies that community pharmacists face, or that has considered with how community pharmacists have dealt with medical emergencies. As detailed above, within hospitals, several papers have looked at pharmacists responding to medical emergencies as part of hospital response teams.

The various pharmacy organizations are surprisingly silent in regards to emergency medical training for pharmacists. Other than ASHP in regards to hospital pharmacists providing services to an emergency department, it appears that no other pharmacy organization has considered the role of pharmacists in responding to acute medical emergencies.

Reviewing the interventions that each level of EMT can provide, it becomes apparent that the advanced levels increasingly focus on providing two types of interventions – 1) advanced medical interventions such as airway intubation and cardiac defibrillation and 2) pharmacotherapy via IV administered mediations. Pharmacists, given their specialized understanding of pharmacotherapy, therefore potentially would make excellent EMTs particularly at the higher levels of training where a number of pharmaceutical interventions are available. It is currently unknown, however, how many pharmacists also have licenses/certification as EMTs, and if so, at what levels of practice. This study will assess the

levels of certifications currently held by pharmacists and in what geographic areas, urban, suburban or rural, those pharmacists can be found.

Pharmacists' Efficacy in Addressing Medical Emergencies

Another study aim is to determine pharmacists' efficacy in dealing with an medical emergency. According to Bandura, self-efficacy theory considers an individual's expectations that they are capable of producing behaviors that help produce those desired outcomes in a particular situation (Bandura, 1977). In essence, a person's belief that they can succeed in a behavior determines whether they will perform that behavior. Bandura identified four factors that influence self-efficacy, which are performance accomplishments, vicarious experience, verbal persuasion, and physiological states.

Self-efficacy theory has been applied to pharmacists in a variety of contexts. For instance, self-efficacy has been used to measure pharmacists' intention to provide MTM services (Martin et al., 2010). Pharmacists' intention to provide pharmaceutical care has also been assessed using self-efficacy theory (Odedina et al., 1997). Pharmacists' efficacy in providing emergency medical services, however, has not been studied yet.

Self-efficacy is a part of the larger Social Cognitive Theory, which is an agency perspective for human behavior that postulates that individuals are not only products of their environment, but that they also help shape their environment through their experiences. This agency theory is composed of three aspects- personal, proxy, and collective agency (Bandura, 2000). Self-efficacy theory covers the personal agency aspect, but equally applicable to pharmacists is the collective aspect. Collective efficacy is the study of shared group beliefs in their ability to produce a desired result. Pharmacists frequently work in groups of people, in that they often work together with pharmacy technicians or other pharmacists. Pharmacists are also leaders within the pharmacy, whether it be directing technicians or serving as the pharmacist-in-

charge. In the context of medical emergencies occurring within the pharmacy, collective efficacy is therefore relevant to how the pharmacy as a whole would be able to respond to the situation. As is the case with self-efficacy, pharmacists' beliefs in theirs and their co-workers' ability to provide emergency medical services has not been studied yet.

METHODS

Study Design

This study uses a cross-sectional, non-experimental, descriptive design. It utilizes a self-administered, Internet-based survey distributed via electronic mail to a national sample of community pharmacists.

Sample

Sample Description

The sample used for this study comprises a national convenience sample of community pharmacists. Community pharmacists were chosen for this study because they are at locations where it is possible that medical emergencies may occur and in which the pharmacist would likely be the most experienced medically-trained personnel at the location. Institutional pharmacists were not included because, although medical emergencies may frequently occur in an institutional setting, those emergencies are likely to occur within the emergency room, intensive care unit, or other facilities where pharmacists would not be the primary care providers and where such emergencies are expected to occur. Although pharmacists may assist in providing patient care during medical emergencies at institutional locations, this study seeks to address pharmacists' preparedness and ability to respond to those emergencies that may occur within the general community. Institutional outpatient pharmacists were excluded for similar reasons, particularly since patients would be able to seek help at the institution itself and not rely on the pharmacy as the only source of emergency care.

For the purposes of this study, community pharmacists are considered to be all pharmacists working in retail sales of pharmaceuticals to in-store customers, including chain drug stores, grocery stores with pharmacies, retailers that include pharmacies (e.g. Target, Wal-Mart), and independent pharmacies. Pharmacists that exclusively work in mail order pharmacies are excluded from this study as it is extremely unlikely that a medical emergency involving a patient would occur at one.

Community pharmacists were chosen as the primary respondents, as opposed to retail managers or other corporate managers, because those community pharmacists are individuals who would best be able to describe any medical emergencies that would have occurred while they were working at their location, as this would be based on their personal experience. As leaders of the pharmacy team, they would also able to best report on the level of training of each employee of the pharmacy. As the health care provider who would need to respond to a medical emergency that would occur within the pharmacy, community pharmacists also would likely best remember incidents that may have happened at their pharmacy and due to the significant nature of the emergency have the least amount of recall bias.

A national sample was chosen in order to maximize the generalizability of any findings. Additionally, a number of comparisons consider differences between urban, suburban and rural practice locations. A convenience sample of only one state (Mississippi) community pharmacists would not be able to address this potential difference, as Mississippi is primarily a rural state. A national sample would be more generalizable than a single state.

Sample Source

This study used a convenience sample from a panel of community pharmacists assembled by Delta Marketing Dynamics Healthcare Research. The full panel consisted of approximately 5000 community pharmacists from both independent and chain pharmacies. The panel was a

stratified sample of pharmacists from four regions intended to cover the entirety of the United States. Panelists were incentivized to participate in this study by appealing to good will for the profession and being offered an executive summary of the results.

Sample Size

Two estimates were used for calculating the sample size for the study. First, the sample size needed for this study was calculated using G*Power 3. The estimate of sample size for a fixed-effects, one-way Analysis of Variance (ANOVA) using a medium effect size (0.25), α = 0.05, power = 0.95 and with five groups was 305 respondents. Sample size was also calculated using the method set forth by Dillman (2009) that uses the formula:

$$N_s = \frac{(N_p)(p)(1-p)}{(N_p-1)(B/C)^2 + (p)(1-p)}$$

Wherein

N_s = the completed sample size needed for the desired level of precision.

N_p = the size of the population

p = the proportion of the population expected to choose one of the response categories.

B = margin of error (half of the desired confidence interval width, i.e. ±5%)

C = Z score associated with the confidence level (1.96 at 95%).

Using this formula for an estimated community pharmacist population size of 140,000 (one-half of the 274,900 pharmacists employed in US as of 2010) (US Department of Labor, 2012), with the proportion of the population expected to choose one of two response categories (p = 0.5), a margin of error of 0.05 and a Z score of 1.96 (95% confidence interval), the formula then becomes:

$$N_s = \frac{(140{,}000)(0.5)(1-0.5)}{(140{,}000-1)(0.05/1.96)^2 + (0.5)(1-0.5)}$$

which resulted in 383 completed observations needed for the study. Taking into consideration both sample size calculations and considering the most conservative option, it was determined that 383 completed surveys were needed for this study.

Measures

The following measures were created for use in this study. A complete copy of the survey provided to respondents with the measures described below is attached hereto as Appendix A.

Demographics

Survey questions were developed in order to assess the demographic characteristics of responding community pharmacists. Demographic information collected was the pharmacist's type of practice within the community setting (e.g. independent, chain drug store, retailer, etc.), their position at the pharmacy, how many years of practice as a pharmacist, length of time in their current position, the state in which they practice and whether they characterize their practice as urban or rural, degrees earned, gender, and age.

Objective 1

A survey was developed for this project containing questions concerning the training received by community pharmacists and others working within the pharmacy, the frequency with which such emergencies occur within the community setting, as well as their level of preparedness and emergency equipment available for addressing acute medical emergencies. Survey questions were developed based on literature and the author's experience to address the level of preparedness for medical emergencies in community pharmacies.

Objective 2

Following a review of the literature, an appropriate scale for measuring self-efficacy in pharmacists responding to emergency situations was not found. Barbaranelli and Capanna

(2001) developed a scale in Italian for measuring self-efficacy and collective efficacy in rescue workers, but following translation this scale was found to not be specific enough to emergency situations that would be faced by pharmacists.

Scales were developed for this study in order to assess pharmacist efficacy in addressing emergency medical situations. A nineteen item scale was developed to assess pharmacists' self-efficacy in responding to emergency medical situations. Items included the pharmacist's confidence in performing CPR, using an AED, and performing other rescue skills, as well as an assessment of how well the pharmacist believed their training prepared them for responding to medical emergencies.

A thirteen item scale was also developed to assess pharmacists' collective efficacy for their pharmacy concerning medical emergencies. Items included the pharmacist's belief that they and their co-workers could effectively perform CPR, use an AED, and other rescue skills, as well as assessing the belief of whether the pharmacy encourages and supports training in emergency medical skills.

The efficacy scales and survey questions from Objectives 1 and 2 were refined following qualitative in-depth interviews with several local pharmacists.

Objective 3

This objective utilized the demographic, descriptive, self-efficacy, and collective efficacy measures described above. No additional measures were created for this objective.

Pre-Testing

Before pre-testing and subsequent data collection, this study was approved by The University of Mississippi Institutional Review Board. The survey was pretested using a convenience sample of Mississippi community pharmacists. An email containing a cover letter and link to the survey was sent to the convenience sample, and included a section for comment

by the respondents about the survey so that feedback could be garnered by the investigators. Thirty-seven completed and usable responses were obtained in the pre-test. Pre-test analysis included principal component analysis (PCA) with VARIMAX rotation, followed by item-total correlations and Cronbach's alpha for each subscale. Means, standard deviations, and per item means were calculated for each subscale. Means, frequencies, and percentages were used to evaluate demographic data and other descriptive survey questions. Results of the pretest were used to further refine the survey items.

Data Collection

An email containing a cover letter and link to the survey was sent to the participating community pharmacist panelists. The cover letter described the nature of the study and thanked the pharmacists for their participation (a copy is attached hereto as Appendix B). The link directed panelists to the Qualtrics website that hosted the survey. Reminder emails were sent using a modified Dillman method to panelists who did not initially complete the survey after one week. Panelists who did not respond to the survey were replaced by additional panelists until the needed sample size was obtained.

Data Management

Data collected from the Qualtrics survey were imported into Microsoft Excel for cleaning and quality assurance. Data were then imported into SPSS version 21 for analysis. The survey in Qualtrics was set to force item responses so there was no missing data in the data set. To the extent there would have been missing data; those data would have been handled according to the process set forth by Hair et al. (2010).

Data Analysis

Demographics

Data were analyzed to describe the demographic characteristics of the respondents (type of practice, position, years practicing, time in current position, state, rural/suburban/urban practice, degrees earned, gender, and age) using frequencies, percentages and means.

Objective 1

Data were analyzed to determine the state of emergency preparedness of the respondents (training, frequency of emergencies, level of preparedness and emergency equipment available) using frequencies, percentages and means.

Objective 2

Initially, a principal component analysis (PCA) using VARIMAX rotation was performed for all self-efficacy and collective efficacy items in order to define a set of underlying dimensions of self-efficacy and collective efficacy. To examine reliability, item-total correlations and Cronbach's alpha were calculated for each of these subscales. Means, standard deviations, and per item means were calculated for each subscale to complete meeting the second objective of measuring community pharmacists' self-efficacy and collective efficacy with regard to acute emergency preparedness.

Objective 3

Analysis of variance (ANOVA) was used to determine if there was a difference in pharmacists' perceived efficacy based on rural/suburban/urban location and prior experience with medical emergencies. These comparisons were made using self-efficacy and collective efficacy subscales identified in PCA procedures. Additionally, an ANOVA was conducted to determine if emergency events occur more frequently in urban, suburban or rural pharmacies.

Self-efficacy and collective efficacy subscales were also compared with the type of community practice (e.g. independent, grocery, etc.) using multivariate analysis of variance (MANOVA) to determine if there is a difference in pharmacists' perceived efficacy based on their practice environment. The level of significance used for these tests was $\alpha = 0.05$. Before conducting analyses, assumptions of homogeneity of variance-covariance matrices, independence, linearity and existence were assumed.

Correlation coefficients were calculated to test the degree of correlation between age and self-efficacy and collective efficacy subscales. This procedure was repeated for testing the degree of correlation between years of actively practicing pharmacy and the self-efficacy and collective efficacy subscales.

RESULTS

Sample Description

Participant Response. A total of 393 completed, useable responses were obtained. Participants were included in this study only if they were community pharmacists (screened at the start of the survey). A total of 4854 panelists were emailed the survey, of which 475 surveys were started by respondents (response rate 9.78%). However, surveys that were not completed were excluded from the data analysis, with a completed response rate of 8.1%.

Respondent Demographics. The average age of respondents was 49 years old. The sample consisted of 254 men (64.5%) and 140 women (35.4%). Racially, the sample was predominantly composed of Caucasians (86.5%) followed by Asians (8.4%). The most common education level was a Bachelor of Science in Pharmacy degree (72.5%) followed by a Doctor of Pharmacy degree (29.7%). Approximately 7% of the sample had additional advanced degrees. A full description of respondents' demographic characteristics is provided in Table 1.

Table 1. Characteristics of Respondents

Characteristic	Number of Respondents (%)
Gender	
Male	254 (64.5%)
Female	139 (35.4%)
Race/Ethnicity	
African-American	7 (1.8%)
American Indian/Alaska Native	2 (0.5%)
Asian	33 (8.4%)
Native Hawaiian/Pacific Islander	0 (0.0%)
White	341 (86.5%)
Multiracial	10 (2.5%)
Education	
Bachelor of Science in Pharmacy (B.S. Pharm.)	285 (72.5%)
Doctor of Pharmacy (Pharm.D.)	117 (29.7%)
Master of Science (M.S.)	8 (2.0%)
Doctor of Philosophy (Ph.D.)	4 (1.0%)
Other	15 (3.8%)

Characteristic	Mean (Standard Deviation)	Median	Range
Age	48.91 (11.19)	50	25 – 75

Respondent Practice Characteristics. On average, the respondents have been practicing pharmacy for 23 years. The average length of practice at their current pharmacy was 13.25 years. The majority of respondents considered themselves the Pharmacy Manager or Pharmacist in Charge (53.3%). The most common practice location was independent pharmacies (48.7%), with chain drug stores and grocery stores with pharmacies represented in approximately the same frequency (20.1% and 23.6% respectively). The geographic locations of the respondents was approximately equally distributed between urban, suburban and rural locations (29.3%, 38.7% and 32.1% respectively). A full description of respondents' practice characteristics is provided in Table 2.

Table 2. Practice Characteristics of Respondents

Characteristic	Mean (Standard Deviation)	Median	Range
Years Practicing Pharmacy	23.39 (11.69)	24	1 – 60
Time at current pharmacy			
Years	13.07 (10.07)		
Months	4.18 (3.40)		

Characteristic	Number of Respondents (%)
Position	
Staff Pharmacist/Relief Pharmacist	112 (28.5%)
Pharmacy Manager/ Pharmacist in Charge	210 (53.3%)
District Manager / Regional Manager	1 (0.3%)
Pharmacy Owner	66 (16.8%)
Other	4 (1.0%)
Practice Location	
Independent pharmacy	192 (48.7%)
Chain drug store	79 (20.1%)
Grocery store with a pharmacy	93 (23.6%)
Retailer with a pharmacy	29 (7.4%)
Geographic characterization	
Urban	115 (29.3%)
Suburban	152 (38.7%)
Rural	126 (32.1%)

Objective 1

Respondents' Emergency Training. Nearly all pharmacists reported being trained in CPR at some point (87.5%). The number of respondents currently trained in CPR/BLS dropped, however (69.5%). Approximately half of the respondents reported that they were currently certified to operate an AED (51.4%). Other than CPR/BLS, the most common certifications were ACLS (8.9%) and PALS (3.8%). Very few pharmacists reported having additional medical training focused on community emergency situations, with First Responder/Emergency Medical

Repsonder status being the most common (2.5%). A full description of respondents' emergency medical training and certifications is provided in Table 3.

Table 3. Pharmacist Emergency Training

Characteristic	Number of Respondents (%)
Trained in CPR at any point	344 (87.5%)
Emergency Training Certifications	
CPR/Basic Life Support	273 (69.5%)
Advanced Cardiac Life Support (ACLS)	35 (8.9%)
Pediatric Advanced Life Support (PALS)	15 (3.8%)
First Responder/Emergency Medical Responder	10 (2.5%)
Emergency Medical Technician-Basic (EMT-B)	3 (0.8%)
Emergency Medical Technician-Intermediate (EMT-I)	1 (0.3%)
Advanced Emergency Medical Technician (AEMT)	1 (0.3%)
Paramedic (EMT-P)	1 (0.3%)
None of the above	64 (16.3%)
Currently certified to operate AED	202 (51.4%)

Emergency Equipment Available. Pharmacists were asked about what emergency medical equipment was on hand at their pharmacy to address emergency situations. Most pharmacies had on hand gloves to protect their pharmacists (95.2%), first aid kits (88.8%) and epinephrine injection pens ("Epi Pens," 95.7%). Other emergency equipment was less common, particularly advanced breathing devices such as a Bag-valve mask (10.2%). In addition to common emergency equipment, respondents were also asked whether their pharmacy had an AED available. Only a small percentage (7.9%) reported yes. A full description of respondents' emergency medical equipment available is provided in Table 4.

Table 4. Emergency Equipment Available

Characteristic	Number of Respondents (%)
Emergency Equipment Available (other than AED)	
Gloves	374 (95.2%)
First aid kit	349 (88.8%)
Pocket mask	221 (56.1%)
Microshields	127 (32.3%)
Bag valve mask	40 (10.2%)
Epi Pen	376 (95.7%)
Glucagon emergency kit	253 (64.4%)
None of the above	3 (0.8%)
Automated External Defibrillator (AED) available	31 (7.9%)

CPR and AED Training Requirements. Respondents were asked to report whether they were required by their employer to be certified in either CPR or AED use. Approximately half of the respondents answered that they had some sort of training requirement, whether it be CPR alone (34.6%) or CPR and AED training (21.1%). When asked whether other members of their pharmacy were required to be trained in either CPR or CPR and AED, those percentages dropped (24.9% and 16.2% respectively). Pharmacists were also asked which other members of their pharmacy were required to be trained in these skills. The majority answered that other pharmacists were required to be trained (59.4%), but all other positions listed (pharmacy technicians, clerks, cashiers, front sales personnel, interns/externs, and students on rotation) were reported to have a requirement far less frequently (<5%). A full description of respondents' CPR and AED training requirements is provided in Table 5.

Table 5. CPR and AED Certification

Respondent required to be certified in either CPR or AED	Respondent pharmacist (%)	Other members of the pharmacy (%)
Not required	162 (41.1%)	208 (52.8%)
CPR only	136 (34.6%)	98 (24.9%)
CPR and AED	83 (21.1%)	64 (16.2%)
Unsure	3 (0.8%)	9 (2.3%)
Other	9 (2.3%)	14 (3.6%)

Which other personnel required to be certified	Number of Respondents (%)
Other pharmacists	234 (59.4%)
Pharmacy Technicians	12 (3.1%)
Clerks	1 (0.3%)
Cashiers	1 (0.3%)
Front sales personnel	4 (1.0%)
Interns or Externs	19 (4.8%)
Students on rotation	14 (3.6%)
Unsure	11 (2.8%)
None of the above	146 (37.1%)

CPR and AED Experience. Respondents were asked about their experience in the performance of CPR or used an AED on a person. Approximately 10% of pharmacists reported having performed CPR before, but very few reported using an AED on a person (1%). A full description of respondents' CPR and AED experience is provided in Table 6.

Table 6. CPR and AED Experience

Characteristic	Number of Respondents reporting performance (%)	Mean # of times performed (SD)	Median	Range
Performed CPR on a person	39 (9.9%)	3.62	1	1 – 40
Used an AED on a person	4 (1.0%)	7.00	3.5	1 – 20

Occurrence of Medical Emergencies. Respondents were asked about various types of medical emergencies that may have occurred within their pharmacy. In the event that an

emergency had occurred, respondents were asked to provide information about its frequency. The most commonly reported events were unconsciousness/unresponsiveness/fainting (42.2%), seizures (32.1%) and diabetic emergencies (21.1%). Those three emergency types also had the most reported number of occurrences (1-20, 1-12 and 1-12 respectively). A full description of the occurrence of medical emergencies at the respondents' pharmacies is provided in Table 7.

Table 7. Occurrence of Medical Emergencies in Pharmacies

Occurrence of particular medical emergencies	Number of Respondents reporting occurrence (%)	Mean	Median	Range of occurrences
Heart attack (MI)	45 (11.5%)	1.27	1	1 – 3
Difficulty breathing	50 (12.7%)	1.59	1	1 – 6
Asthma exacerbation	68 (17.3%)	2.22	2	1 – 10
Unconsciousness/Unresponsiveness /Fainting	166 (42.2%)	1.62	1	1 – 20
Severe bleeding or trauma	46 (11.7%)	1.62	1	1 – 12
Anaphylaxis/allergic reaction	38 (9.7%)	1.43	1	1 – 6
Diabetic emergency	83 (21.1%)	1.94	1	1 – 12
Seizure	126 (32.1%)	1.50	1	1 – 6
Other	29 (7.4%)	1.55	1	1 – 5

Objective 2

The second objective for this study was to develop scales to measure pharmacists' self-efficacy and collective efficacy in responding to emergency medical situations. Two scales were developed for this study. The first scale was a nineteen (19) item scale developed to measure self-efficacy. The second scale was a thirteen (13) item scale developed to measure the respondent's collective efficacy. Items for both scales were developed based on a thorough search of the literature and using the author's experience with emergency medicine, but were not taken from any established scale. Both scales were 7-point linear numeric scales where 1 = "Strongly Disagree" and 7 = "Strongly Agree."

Principal Component Analysis. A principal component analysis (PCA) using VARIMAX rotation was performed for all self-efficacy and collective efficacy items in order to define a set of underlying dimensions of self-efficacy and collective efficacy. To examine reliability, item-total correlations and Cronbach's alpha were calculated for each of these subscales. Means, standard deviations, and per item means were calculated for each subscale.

Although the self-efficacy scale initially had nineteen (19) items, four items were removed after assessing factor loadings and consideration that the items were not measuring self-efficacy. The following items were deleted:

- I feel stressed when a medical emergency occurs in my pharmacy.
- I am worried about having to deal with medical emergencies that might occur in my pharmacy.
- My employer would expect me to take the lead in responding to medical emergencies that occur within my pharmacy.
- My co-workers would expect me to take the lead in responding to medical emergencies that occur within my pharmacy.

The final analyzed scale consisted of fifteen items split between two different factors. The first factor contained nine items and measured general basic life support self-efficacy. The second factor contained six items and measured self-efficacy for medical situations beyond those covered by basic life support training. All of the factors had high standardized coefficients, with the exception of fourth factor in the general BLS-Skills component. That factor concerns choking, which is a skill taught within the BLS curriculum but it is not the focus of the course, and it could be perceived as a separate skill. Notably, that factor loads onto the non-BLS Skills component in the collective efficacy scale. The standardized coefficients obtained from the

rotated factor matrix for each factor, along with the factors each item loaded onto, are fully detailed in Table 8.

Although the collective efficacy scale initially had thirteen (13) items, three items were removed after assessing factor loadings and consideration that the items were not measuring collective efficacy. The deleted items were:

- My pharmacy has a policy for addressing how to manage medical emergencies.
- My pharmacy encourages its employees to be prepared for medical emergencies
- My pharmacy offers opportunities for training and refresher courses in CPR or other emergency management.

The final analyzed scale consisted of ten (10) items split equally into two factors of five items each. Similar to the self-efficacy scale, the first factor measured general basic life support self-efficacy and the second factor measured self-efficacy for medical situations beyond those covered by basic life support training. The standardized coefficients obtained from the rotated factor matrix for each factor, along with the factors each item loaded onto, are fully detailed in Table 9.

Reliability. Reliabilities of the four components of the two scales were calculated using Cronbach's alpha. Table 8 lists the two components and their corresponding items for the self-efficacy scale, along with the Cronbach's alpha for the scale, the summated means of the items and the standard deviation of the scale score, as well as the per-item means for each item. Table 9 lists the corresponding Cronbach's alpha, summated mean and standard deviation, and per-item means for each item of the two factors of the collective-efficacy scale.

Table 8. Self-Efficacy Scale Principal Component Analysis and Reliability Results

Items*	Standardized Coefficients	Cronbach's Alpha	Means ± SD	Per-Item Mean
Component 1 – BLS Skills		**0.959**	**43.59 ± 13.923**	**4.844**
I feel confident in my ability to perform CPR in an emergency situation in my pharmacy.	0.766			4.96
I feel confident in my ability to use an AED in an emergency situation in my pharmacy.	0.879			4.14
I feel confident in my ability to perform rescue breathing in an emergency situation in my pharmacy.	0.800			4.94
I feel confident in my ability to help someone who is choking in my pharmacy.	0.593			5.36
My emergency training has sufficiently prepared me to effectively perform CPR.	0.798			4.82
My emergency training has sufficiently prepared me to effectively use an AED.	0.873			4.09
My emergency training has sufficiently prepared me to effectively perform rescue breathing.	0.789			4.87
My emergency training has sufficiently prepared me to effectively help someone who is choking.	0.649			5.15
I can still remember enough of my CPR training so that I can use it.	0.685			5.26
Component 2 – Other Medical Situations		**0.923**	**30.87 ± 7.436**	**5.145**
I feel confident in my ability to help someone who is bleeding profusely in my pharmacy.	0.751			5.02
My emergency training has sufficiently prepared me to effectively help someone who is bleeding profusely.	0.728			4.69
I am confident I could effectively respond to a medical emergency that took place in my pharmacy.	0.719			5.13
I can remain calm when addressing a medical emergency in my pharmacy.	0.854			5.52
If there were a medical emergency in my pharmacy, I am confident I could handle the situation.	0.834			5.33
I feel prepared to deal with medical emergencies that may arise in my pharmacy.	0.773			5.19

* Items were measured on a 7-point linear numeric scale where 1 = Strongly Disagree and 7 = Strongly Agree.

Table 9. Collective-Efficacy Scale Principal Component Analysis and Reliability Results

Items*	Standardized Coefficients	Cronbach's Alpha	Means ± SD	Per-Item Mean
Component 1 – BLS Skills		**0.890**	**23.75 ± 6.494**	**4.749**
My pharmacy can effectively manage an emergency medical situation.	0.753			5.09
My pharmacy is prepared to deal with medical emergencies that occur within it.	0.787			5.02
My pharmacy co-workers and I can effectively work together to perform CPR.	0.730			4.83
My pharmacy co-workers and I can effectively work together to use an AED.	0.806			4.03
My pharmacy co-workers and I can effectively work together to perform rescue breathing.	0.751			4.77
Component 2 – Other Medical Situations		**0.917**	**26.20 ± 5.692**	**5.421**
My pharmacy co-workers and I can effectively work together to help someone who is choking.	0.718			5.31
My pharmacy co-workers and I can effectively work together to help someone who is bleeding profusely.	0.774			4.98
My pharmacy would be able to effectively work with rescue personnel in addressing medical emergencies.	0.819			5.49
I can rely on my co-workers to do their part in addressing a medical emergency.	0.829			5.15
My co-workers and I would work well together in crisis situations.	0.860			5.27

* Items were measured on a 7-point linear numeric scale where 1 = Strongly Disagree and 7 = Strongly Agree.

Objective 3

The third objective of this study was two-fold. First, this objective sought to determine whether there was a difference in the frequency of medical emergency events relative to the respondent's practice location. The second part of this objective was to determine if respondents' self-efficacy and collective efficacy differed based on several variables:

1) Respondent's age
2) Respondent's number of years of practicing pharmacy
3) Location of Practice- where the respondent was asked to characterize their pharmacy as being in an urban, suburban or rural location.
4) Type of Practice- characterized by being an independent pharmacy, chain pharmacy, a grocery store with a pharmacy or a retailer with a pharmacy.
5) Pharmacist's Position- where the respondent was asked to characterize their position as either a staff pharmacist, pharmacy manager/pharmacist-in-charge, or pharmacy owner.
6) Respondent's Prior Experience- characterized by whether the respondent had previously performed CPR in an emergency medical situation

A correlation was run to assess the four efficacy components against the independent variables of the respondent's age and their number of years practicing pharmacy. Multivariate analysis of variance (MANOVA) was performed to test the last four independent variables against the dependent variables of the combined four components of the self-efficacy and collective efficacy scales, as described in Objective II. The scores on each component for each responding pharmacist were calculated as an aggregate score for all of the survey items corresponding to the particular component. Three assumptions were made for the MANOVA analyses. First, it was assumed that each of the observations was independent. Second, it was assumed there is

homogeneity of the variance-covariance matrices, in that there are no substantial differences in the amount of variance from one group verses another for the dependent variables. Third, multivariate normality was assumed, in that all of the dependent variables are normally distributed, any linear combination of the DVs must be distributed normally, and all subsets of the variables must have a multivariate normal distribution

Additionally, a correlation was run between the four components of the efficacy scales to ensure that the data could be used together in a MANOVA. All of the components showed a very significant, strong, positive correlation to each of the other components. Results from the correlation of the efficacy components are reported in Table 10.

Table 10. Correlation of Components of the Self-Efficacy and Collective Efficacy Scales

		Self-efficacy BLS Skills	**Self-efficacy Other medical situations**	**Collective efficacy BLS Skills**	**Collective efficacy Other medical situations**
Self-efficacy BLS Skills	Pearson Correlation Significance N	1 393	0.775 <0.001 393	0.779 <0.001 393	0.472 <0.001 393
Self-efficacy Other medical situations	Pearson Correlation Significance N	0.775 <0.001 393	1 393	0.696 <0.001 393	0.635 <0.001 393
Collective-efficacy BLS Skills	Pearson Correlation Significance N	0.779 <0.001 393	0.696 <0.001 393	1 393	0.728 <0.001 393
Collective-efficacy Other medical situations	Pearson Correlation Significance N	0.472 <0.001 393	0.635 <0.001 393	0.728 <0.001 393	1 393

Frequency of Events by Location of Practice. An ANOVA was utilized to determine whether there are differences in the occurrence of particular medical emergencies relative to the location of practice of the pharmacist. The independent variable for this analysis was based on how the respondent characterized their location of practice. The variable was categorized into

locations based on whether the respondent characterized their primary pharmacy practice location as being urban, suburban or rural.

The dependent variables for this analysis were specific medical emergencies. Pharmacists were first asked whether that specific medical emergency had ever occurred within their pharmacy, and if they answered yes, they were asked to provide how many times that specific medical emergency has occurred. The specific medical emergencies were 1) heart attack/myocardial infarction, 2) difficulty breathing (e.g. choking), 3) asthma exacerbation, 4) unconsciousness/unresponsiveness/fainting, 5) severe bleeding or trauma, 6) anaphylaxis/allergic reactions, 7) diabetic emergency, 8) seizure, and 9) other medical emergencies not previously covered (which allowed the respondent to provide more information if they so chose). A further dependent variable used in this ANOVA was a general question that asked respondents how many medical emergencies have occurred within their pharmacy since the time they started practicing as a pharmacist. This variable was not an aggregate of the prior specific medical emergencies, but rather the pharmacist's recollection of the frequency by which medical emergencies had occurred over their career.

Results for the mean number of medical emergencies, along with the standard deviation and the range of minimum and maximum events, are reported in Table 11. On average, the mean frequency of specific medical emergencies was less than one for each of the specific medical emergencies. The average number of medical emergencies per pharmacist is approximately three, and was consistent for each of the practice locations.

The results for the ANOVA for medical emergencies by practice location are shown in Table 12. No significant differences were found for the occurrence of medical emergencies relative to the location of practice.

Table 11. Mean Number of Medical Emergency Events by Practice Location

		Number	Mean	Standard Deviation	Minimum	Maximum
Heart Attack	Urban	115	0.12	0.354	0	2
	Suburban	156	0.20	0.540	0	3
	Rural	126	0.10	0.397	0	3
	Total	393	0.15	0.448	0	3
Difficulty Breathing	Urban	115	0.26	0.750	0	6
	Suburban	156	0.22	0.736	0	6
	Rural	126	0.14	0.501	0	3
	Total	393	0.21	0.674	0	6
Asthma Exacerbation	Urban	115	0.37	0.862	0	6
	Suburban	156	0.41	1.369	0	10
	Rural	126	0.37	1.093	0	6
	Total	393	0.39	1.148	0	10
Unconsciousness Unresponsiveness Fainting	Urban	115	0.69	1.021	0	6
	Suburban	156	0.78	1.849	0	20
	Rural	126	0.61	0.921	0	5
	Total	393	0.70	1.377	0	20
Severe Bleeding or Trauma	Urban	115	0.25	1.191	0	12
	Suburban	156	0.16	0.533	0	3
	Rural	126	0.17	0.538	0	4
	Total	393	0.19	0.785	0	12
Anaphylaxis Allergic Reaction	Urban	115	0.14	0.494	0	3
	Suburban	156	0.13	0.426	0	3
	Rural	126	0.17	0.654	0	6
	Total	393	0.15	0.527	0	6
Diabetic Emergency	Urban	115	0.44	1.325	0	12
	Suburban	156	0.43	0.946	0	5
	Rural	126	0.37	0.960	0	6
	Total	393	0.41	1.073	0	12
Seizure	Urban	115	0.58	0.937	0	4
	Suburban	156	0.42	0.810	0	5
	Rural	126	0.48	0.846	0	6
	Total	393	0.48	0.860	0	6
Other	Urban	115	0.15	0.625	0	5

Emergencies	Suburban	156	0.12	0.381	0	2
	Rural	126	0.10	0.487	0	3
	Total	393	0.12	0.495	0	5
Total Emergencies Since Practicing	Urban	115	3.11	4.085	0	24
	Suburban	156	3.47	5.556	0	40
	Rural	126	3.12	4.789	0	40
	Total	393	3.25	4.908	0	40

Table 12. ANOVA Results for Frequency of Events Dependent Variables by the Location of Practice Independent Variable

		Sum of Squares	df	Mean Square	F	Significance
Heart Attack	Between Groups	0.699	2	0.350	1.748	0.175
	Within Groups	78.033	389	0.200		
	Total	78.733	392			
Difficulty Breathing	Between Groups	0.867	2	0.434	0.953	0.386
	Within Groups	177.438	389	0.455		
	Total	178.305	392			
Asthma Exacerbation	Between Groups	0.227	2	0.113	0.086	0.918
	Within Groups	516.755	389	1.325		
	Total	516.982	392			
Unconsciousness Unresponsiveness Fainting	Between Groups	1.897	2	0.949	0.499	0.607
	Within Groups	741.070	389	1.900		
	Total	742.967	392			
Severe Bleeding or Trauma	Between Groups	0.599	2	0.284	0.461	0.631
	Within Groups	240.734	389	0.617		
	Total	241.303	392			
Anaphylaxis Allergic Reaction	Between Groups	0.090	2	0.045	0.162	0.850
	Within Groups	108.642	389	0.279		
	Total	108.733	392			
Diabetic Emergency	Between Groups	0.372	2	0.186	0.161	0.851
	Within Groups	450.671	389	1.156		
	Total	450.043	392			
Seizure	Between Groups	1.540	2	0.770	1.040	0.354
	Within Groups	288.603	389	0.740		
	Total	290.142	392			
Other Emergencies	Between Groups	0.123	2	0.062	0.250	0.779
	Within Groups	96.014	389	0.246		
	Total	96.137	392			
Total Emergencies Since Practicing	Between Groups	12.505	2	6.253	0.259	0.772
	Within Groups	9431.057	389	24.182		
	Total	9443.562	392			

Correlation by Age and Years in Practice with the Efficacy Components. A correlation between the independent variables of the respondent's age and number of years practicing as a pharmacist and the four components from the self-efficacy and collective efficacy scales was performed. Both independent variables were weakly correlated (<0.2) with all of the four efficacy components. Age was found to be significantly correlated with the second self-efficacy component of other medical situations, whereas years practicing as a pharmacist was both the second self-efficacy component of other medical situations and the second collective efficacy component of other medical situations. Results for the correlation are shown in Table 13.

Table 13. Correlation Between Age and Years Practicing as a Pharmacist with the Efficacy Scale Components

		Self-efficacy BLS Skills	Self-efficacy Other medical situations	Collective efficacy BLS Skills	Collective efficacy Other medical situations
Age	Pearson Correlation	-0.041	0.116	-0.029	0.094
	Significance	0.419	0.022	0.561	0.064
	N	393	393	393	393
Years Practicing as a Pharmacist	Pearson Correlation	-0.029	0.100	-0.014	0.114
	Significance	0.573	0.047	0.785	0.023
	N	393	393	393	393

Efficacy by Location of Practice. The independent variable for these analyses was based on how the respondent characterized their location of practice. This variable was categorized into three levels based on whether the respondent characterized their primary pharmacy practice location as being urban, suburban or rural.

The self-efficacy and collective efficacy scales were compared as dependent variables against the independent variable of location of practice using ANOVA. Results for self-efficacy are shown in Table 14 and results for collective efficacy are shown in Table 15. Mean values for the self-efficacy and collective efficacy scales based on location of practice are shown in Table

16. There were significant differences in both self-efficacy ($p = 0.041$) and collective efficacy ($p = 0.002$) for pharmacists based on the location of practice. Tukey post-hoc analysis showed that there were significant differences between urban and rural pharmacists both for self-efficacy ($p < 0.001$) and collective efficacy ($p = 0.033$). No significant differences were seen between the suburban group with the rural and urban groups.

The four components from the self-efficacy and collective efficacy scales were also used as dependent variables in a MANOVA analysis. The results for the MANOVA are shown in Table 17. Mean values of efficacy by location of practice are reported in Table 18. Results of the MANOVA show that there were significant differences between locations of practice and three of the four efficacy components. Only self-efficacy for BLS Skills was not significant for location of practice. Tukey post host analysis of these results showed a significant difference between urban and rural locations for the self efficacy non-BLS component ($p = 0.005$), the collective efficacy BLS component ($p = 0.010$) and the collective efficacy non-BLS component ($p < 0.001$). No significant differences were found between suburban locations and either rural or urban locations.

Table 14. ANOVA Results for Self-Efficacy for Location of Practice

Source	Sum of Squares	df	Mean Square	F	Significance
Location of Practice	2609.207	2	1304.604	3.221	0.041
Error	157974.579	390	405.063		
Total	2339821.000	393			
Corrected Total	160583.786	392			

Table 15. ANOVA Results for Collective Efficacy for Location of Practice

Source	Sum of Squares	df	Mean Square	F	Significance
Location of Practice	1581.313	2	790.657	6.327	0.002
Error	48737.669	390	124.968		
Total	1030820.000	393			
Corrected Total	50318.982	392			

Table 16. Mean Self-Efficacy and Collective Efficacy by Location of Practice

	N	Mean Self-Efficacy	Mean Collective Efficacy
Urban	115	70.77	47.21
Suburban	152	74.93	50.05
Rural	126	77.29	52.33

Table 17. MANOVA Results for Location of Practice

		Sum of Squares	df	Mean Square	F	Significance
Self-efficacy BLS Skills	Between Groups	782.493	2	391.246	2.029	0.133
	Within Groups	75204.368	390	192.832		
	Total	75986.860	392			
Self-efficacy Other medical situations	Between Groups	521.287	2	270.408	4.804	0.007
	Within Groups	21134.823	390	54.192		
	Total	21675.639	392			
Collective efficacy BLS Skills	Between Groups	350.986	2	182.544	4.228	0.013
	Within Groups	16165.467	390	41.450		
	Total	16530.555	392			
Collective efficacy Other medical situations	Between Groups	444.009	2	221.381	7.047	0.001
	Within Groups	12256.953	390	31.428		
	Total	12699.715	392			

Table 18. Component Mean Efficacy by Location of Practice

	Urban		Suburban		Rural	
	N = 115		N = 152		N = 126	
	Mean	SD	Mean	SD	Mean	SD
Self-efficacy BLS Skills	41.51	12.624	43.97	13.962	45.04	14.860
Self-efficacy Other medical situations	29.25	6.986	30.96	7.730	32.25	7.237
Collective efficacy BLS Skills	22.34	6.279	23.97	6.525	24.76	6.489
Collective efficacy Other medical situations	24.87	6.015	26.08	5.654	27.57	5.142

Efficacy by Type of Practice. The independent variable for these analyses was based on how the respondent characterized their type of practice. This variable was categorized into four levels based on whether the respondent characterized their pharmacy as being an independent pharmacy, a chain pharmacy, a grocery store that also included a pharmacy, or a retailer that also included a pharmacy.

The self-efficacy and collective efficacy scales were compared as dependent variables against the independent variable of type of practice using ANOVA. Results for self-efficacy are shown in Table 19 and results for collective efficacy are shown in Table 20. Mean values for the self-efficacy and collective efficacy scales by type of practice are shown in Table 21. There was a significant difference ($p = 0.010$) in self-efficacy for pharmacists based on the type of practice. Tukey post-hoc analysis showed a significant difference between independent pharmacies and chain drug stores ($p = 0.010$). No significant differences were seen in terms of collective efficacy.

The four components from the self-efficacy and collective efficacy scales were also used as dependent variables in a MANOVA analysis. The results for the MANOVA are shown in

Table 22. Mean values of efficacy by type of practice are reported in Table 23. The results showed a significant difference ($p < 0.001$) for self-efficacy for BLS Skills based on the type of practice. Tukey post-hoc analysis showed a significant difference between independent pharmacies and chain drug stores ($p < 0.001$) and independent pharmacies and grocery stores with pharmacies ($p = 0.017$)

Table 19. ANOVA Results for Self-Efficacy for Type of Practice

Source	Sum of Squares	df	Mean Square	F	Significance
Type of Practice	4586.062	3	1528.687	3.812	0.010
Error	155997.724	389	401.022		
Total	2339821.000	393			
Corrected Total	160583.786	392			

Table 20. ANOVA Results for Collective Efficacy for Type of Practice

Source	Sum of Squares	df	Mean Square	F	Significance
Type of Practice	55.705	3	18.568	0.144	0.934
Error	50263.277	389	129.212		
Total	1030820.000	393			
Corrected Total	50318.982	392			

Table 21. Mean Self-Efficacy and Collective Efficacy by Type of Practice

	N	Mean Self-Efficacy	Mean Collective Efficacy
Independent Pharmacy	192	71.16	50.01
Chain Drug Store	79	79.51	50.49
Grocery Store with Pharmacy	93	76.22	49.37
Retailer with Pharmacy	29	77.03	49.97

Table 22. MANOVA Results for Type of Practice

		Sum of Squares	Df	Mean Square	F	Significance
Self-efficacy BLS Skills	Between Groups	3703.831	3	1234.610	6.644	<0.001
	Within Groups	72283.029	388	185.818		
	Total	75986.860	392			
Self-efficacy Other medical situations	Between Groups	97.319	3	32.440	0.585	0.638
	Within Groups	21578.319	388	55.471		
	Total	21675.639	392			
Collective efficacy BLS Skills	Between Groups	120.077	3	40.026	0.949	0.437
	Within Groups	16410.478	388	42.186		
	Total	16530.555	392			
Collective efficacy Other medical situations	Between Groups	100.646	3	33.549	1.036	0.376
	Within Groups	12599.069	388	32.388		
	Total	12699.715	392			

Table 23. Component Mean Efficacy by Type of Practice

	Independent Pharmacy		Chain Drug Store		Grocery Store with Pharmacy		Retailer with Pharmacy	
	N = 192		N = 79		N = 93		N = 29	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Self-efficacy BLS Skills	40.53	15.728	47.65	10.119	45.65	12.373	46.28	10.288
Self-efficacy Other medical situations	30.63	8.144	31.86	6.623	30.57	6.801	30.76	6.637
Collective-efficacy BLS Skills	23.29	6.816	24.70	6.274	23.72	6.341	24.28	5.237
Collective-efficacy Other medical situations	26.72	5.568	25.80	6.014	25.65	5.774	25.69	5.312

Efficacy by Pharmacist Position. The independent variable for these analyses was based on how the respondent characterized their position within their pharmacy. The item on the survey allowed for six levels of response- 1) staff pharmacist/relief pharmacist/floater

pharmacist, 2) pharmacy manager/pharmacist-in-charge, 3) district manager, 4) regional manager, 5) pharmacy owner and 6) other. Only one pharmacist responded that they were a district manager, and their data was recoded into the pharmacy manager level. No pharmacists reported that they were regional managers, so that level of data was also not utilized for this analysis. Four pharmacists responded as "other," of which three were recoded into either pharmacy manager/pharmacist-in-charge or pharmacy owner based on their textual description provided with their "other" response. The fourth pharmacist did not provide a textual response, and so could not be recoded into one of the levels above. Rather than have a category with only one respondent, that pharmacist was instead excluded in this analysis. As such, unlike the other analyses, these results only have data for 392 participants.

The self-efficacy and collective efficacy scales were compared as dependent variables against the independent variable of pharmacist position using ANOVA. Results for self-efficacy are shown in Table 24 and results for collective efficacy are shown in Table 25. Mean values for the self-efficacy and collective efficacy scales by pharmacist position are shown in Table 26. No significant results in self-efficacy or collective efficacy were found.

The four components from the self-efficacy and collective efficacy scales were also used as dependent variables in a MANOVA analysis. The results for the MANOVA are shown in Table 27. Mean values of efficacy by pharmacist position are reported in Table 28. No significant results in self-efficacy or collective efficacy were found.

Table 24. ANOVA Results for Self-Efficacy for Pharmacist Position

Source	Sum of Squares	df	Mean Square	F	Significance
Pharmacist Position	169.957	2	84.979	0.208	0.813
Error	159291.022	389	409.488		
Total	2338140.000	392			
Corrected Total	159460.980	391			

Table 25. ANOVA Results for Collective Efficacy for Pharmacist Position

Source	Sum of Squares	df	Mean Square	F	Significance
Pharmacist Position	270.222	2	135.111	1.051	0.351
Error	50013.278	389	128.569		
Total	1028884.000	392			
Corrected Total	50283.500	391			

Table 26. Mean Self-Efficacy and Collective Efficacy by Pharmacist Position

	N	Mean Self-Efficacy	Mean Collective Efficacy
Staff Pharmacist	112	73.67	48.95
Pharmacy Manager/ Pharmacist in Charge	213	75.14	51.48
Pharmacy Owner	67	74.16	50.02

Table 27. MANOVA Results for Pharmacist Position

		Sum of Squares	df	Mean Square	F	Significance
Self-efficacy BLS Skills	Between Groups	257.158	2	128.579	0.667	0.514
	Within Groups	75020.717	389	192.855		
	Total	76277.875	391			
Self-efficacy Other medical situations	Between Groups	168.766	2	84.383	1.530	0.218
	Within Groups	21459.518	389	55.166		
	Total	21628.283	391			
Collective efficacy BLS Skills	Between Groups	73.215	2	36.607	0.867	0.421
	Within Groups	16424.245	389	42.222		
	Total	16497.459	391			
Collective efficacy Other medical situations	Between Groups	144.326	2	72.163	2.236	0.108
	Within Groups	12555.347	389	32.276		
	Total	12699.673	391			

Table 28. Component Mean Efficacy by Pharmacist Position

	Staff Pharmacist		Pharmacy Manager/ Pharmacist in Charge		Pharmacy Owner	
	N = 112		N = 213		N = 67	
	Mean	SD	Mean	SD	Mean	SD
Self-efficacy BLS Skills	43.53	13.537	44.25	13.432	42.01	15.777
Self-efficacy Other medical situations	30.14	7.707	30.89	7.257	32.15	7.490
Collective efficacy BLS Skills	23.08	6.860	24.06	6.162	23.94	6.904
Collective efficacy Other medical situations	25.87	5.804	25.96	5.640	27.54	5.604

Efficacy by Pharmacist's Prior Experience with Medical Emergencies Requiring CPR. The independent variable for analyses was based on whether the respondent had prior experience with performing CPR. Values were based on the dichotomous response of having experience as

either yes or no. Initially, it was intended that respondents' experience with using an AED would also be an independent variable, however, because only four respondents replied that they had this experience, the analysis was too underpowered to perform. All four of the respondents who did have AED experience also replied that they had CPR experience, so their overall experience with medical emergencies is captured within that independent variable.

The self-efficacy and collective efficacy scales were compared as dependent variables against the independent variable of prior CPR experience using ANOVA. Results for self-efficacy are shown in Table 29 and results for collective efficacy are shown in Table 30. There was a significant difference ($p = 0.035$) in self-efficacy between pharmacists who had performed CPR before and those who had not. No significant difference was seen in terms of collective efficacy.

The four components from the self-efficacy and collective efficacy scales were also used as dependent variables in a MANOVA analysis. The results for the MANOVA are shown in Table 31. Mean values of efficacy by CPR experience are reported in Table 32. A significant difference was seen for second component of the self-efficacy scale for non-BLS skills ($p = 0.004$). The aggregate mean value for self-efficacy for pharmacists who had performed CPR was 34.08, whereas for those who had not performed CPR was 30.52.

Table 29. ANOVA Results for Self-Efficacy for Prior CPR Experience

Source	Sum of Squares	df	Mean Square	F	Significance
Prior CPR Experience	1819.765	1	1819.765	4.482	0.035
Error	840730.258	391	406.046		
Total	2339821.000	393			
Corrected Total	160583.786	392			

Table 30. ANOVA Results for Collective Efficacy for Prior CPR Experience

Source	Sum of Squares	df	Mean Square	F	Significance
Prior CPR Experience	290.293	1	290.293	2.269	0.133
Error	50028.689	391	127.951		
Total	1030820.000	393			
Corrected Total	50318.982	392			

Table 31. MANOVA Results for Prior CPR Experience

		Sum of Squares	df	Mean Square	F	Significance
Self-efficacy BLS Skills	Between Groups	465.495	1	465.495	2.410	0.121
	Within Groups	75521.365	391	193.149		
	Total	75986.860	392			
Self-efficacy Other medical situations	Between Groups	444.508	1	444.508	8.186	0.004
	Within Groups	21231.131	391	54.300		
	Total	21675.639	392			
Collective efficacy BLS Skills	Between Groups	54.919	1	54.919	1.303	0.254
	Within Groups	16475.636	391	42.137		
	Total	16530.555	392			
Collective efficacy Other medical situations	Between Groups	92.684	1	92.684	2.875	0.091
	Within Groups	12607.031	391	42.137		
	Total	12699.715	392			

Table 32. Component Mean Efficacy by Prior CPR Experience

	Prior CPR Experience		No Prior CPR Experience	
	N = 39		N = 354	
	Mean	SD	Mean	SD
Self-efficacy- BLS Skills	46.87	12.681	43.23	14.023
Self-efficacy- Other medical situations	34.08	6.764	30.52	7.431
Collective efficacy- BLS Skills	24.87	6.689	23.62	6.470
Collective efficacy- Other medical situations	27.67	5.913	26.04	5.652

DISCUSSION

Community pharmacies are a point of access for healthcare for a number of people. This is especially true for many patients with chronic diseases who need require medication on a regular basis. Due to their conditions, these patients may be more likely to experience an event requiring emergency medical attention, which may occur in the pharmacy that they regularly visit. Additionally, pharmacies may be closer or more available than hospitals for receiving emergency care, particularly in more rural areas. Community pharmacists' potential responses to these emergency medical events, however, is currently an understudied area.

This study was performed in order to describe both the emergency training that community pharmacists receive and the equipment that community pharmacies have on hand to address medical emergencies. Moreover, the project sought to determine the frequency with which emergency medical events occur within community pharmacies. It was hoped that this study would contribute significantly to the area through the development of measures that could be utilized to assess a pharmacist's self-efficacy and collective efficacy in addressing various emergency medical situations.

Objective 1

The first objective of this study sought to determine how prepared community pharmacists are to address acute medical emergencies that may occur within their pharmacy. Pharmacists were surveyed concerning their emergency medical training, the emergency medical

equipment available at their pharmacy, and the types and frequency of emergency medical events that have occurred at their pharmacy.

The predominant emergency medical training that pharmacists received was CPR, with 87% of pharmacists reporting that they had been CPR trained at some point in their career. However, it appears that pharmacists are not maintaining that CPR training throughout their career as only approximately 70% of pharmacists reported that their certification was current. Additionally, only half of pharmacists responded that they were certified currently to use an AED, suggesting a further drop in training. This is consistent with the employer mandate regarding training in either CPR or CPR/AED use, where approximately half of pharmacists in the sample reported they were required to have some sort of training.

Overall, having more advanced emergency medical training was rare with ACLS and PALS training being the most common, but still less than 9% of respondents. EMS training, either in the form of First Responder or EMT certification, was very rare. That is somewhat understandable as that training is often received in the context of volunteer rescue services, but it does address some medical emergencies that are not addressed by ACLS or PALS such as profuse bleeding and shock. These results are consistent with the prediction that the most common training would be CPR/BLS that is now commonly required in pharmacy school curriculums.

In regard to the emergency medical equipment available for use, nearly all pharmacists reported that their pharmacies had gloves on-hand. This result is not surprising given that gloves should be worn when dispensing a number of medications, so gloves would be ordinary equipment pharmacies would reasonably be expected to have on hand. Additionally, approximately 90% of pharmacies reported having a first aid kit available. The contents of these

first aid kits, however, was not ascertained during this study so their adequacy for addressing certain medical events cannot be assessed. After these basic pieces of medical equipment, the availability of additional medical equipment available drops dramatically. With regard to airway equipment, approximately half of pharmacists reported having access to pocket masks, about a third had Microshields available, and only 10% had the most effective bag-valve masks available.

Perhaps most disappointing was that less than 8% of pharmacies had an AED available for use. Despite half of pharmacists reporting that they are currently certified to use an AED, only one in five of those actually has an AED on hand that could be used. Given that early defibrillation is considered essential in managing many life-threatening cardiac events, this is an area for improvement. The number of AEDs available was also surprising given responses to the questions concerning CPR and AED training requirements for pharmacists.

Two results of equipment on hand merit additional discussion. Ninety-five percent of pharmacists reported having Epi-Pens available and two-thirds reported having Glucagon emergency kits available. These results are not surprising considering that community pharmacies are likely to stock these items for patients, but we do not know if pharmacies currently have the necessarily have protocols set up for administering Epi-Pens or Glucagon in an emergency situation.

The occurrence of medical emergencies varied by the type of emergency. The most common event was unconsciousness/unresponsiveness/fainting, which approximately 40% of pharmacies reported having experienced at some point. The next most common were seizure emergencies and diabetic emergencies. Other events were reported to have occurred at approximately 10-15% of pharmacies. These results indicate that medical emergencies are

occurring at community pharmacies and that pharmacists should be prepared to address these events during their career.

Objective 2

The second objective of this study was to develop scales that could be utilized to measure pharmacists' self-efficacy and collective efficacy in responding to emergency medical situations. Initially a nineteen (19) item self-efficacy scale and a thirteen (13) item collective efficacy scale were developed using the available literature and the author's emergency medical experience. Those scales were refined following data collection to remove items in the interest of performance and parsimony.

Each of the two scales further divided into two component factors. The first factor represented efficacy, either self or collective, at performing in emergency medical situations that are generally covered by BLS training (e.g. performing CPR, utilizing an AED, performing rescue breathing). The second factor represented efficacy, either self or collective, at performing in emergency medical situations that are beyond the scope of BLS training (e.g. addressing profuse bleeding) or generalized unknown medical situations.

Interestingly, the items of the self-efficacy and collective efficacy scales contain very similar items that are split between the same components, with the exception of addressing the situation of choking, where those items loaded onto the BLS factor in the self-efficacy scale but loaded onto the non-BLS factor in the collective efficacy scale. The standard coefficients from the rotated component matrix for the choking items, however, were the lowest of all the items in the scales (0.593 for the self-efficacy scale and 0.718 for the collective efficacy scale). Although managing a choking situation is a skill taught as part of BLS training, it is likely that this skill is outside of the core elements of the program and, thus, represents a hybrid transition between the CPR/AED training of BLS and the absence of medical training for other situations.

Although the factors divide between BLS and non-BLS emergencies, it is interesting that the item-means for the BLS factors (4.844 for the self-efficacy scale and 4.749 for the collective efficacy scale) are lower than those for the more general non-BLS factors (5.145 for the self-efficacy scale and 5.421 for the collective efficacy scale). It is possible that because the BLS training items are more familiar to the respondents than the non-BLS items, there is a tendency to be more apprehensive about these items and rate them lower.

Objective 3

This objective sought to determine whether there was a difference between the frequency of medical emergencies relative to practice location. Additionally, this objective sought to determine whether respondents' self-efficacy and collective efficacy differed based on several variables, both as complete scales and as subcomponents of those scales.

Location of Practice by Frequency of Events

No significant differences were seen between the location of practice (urban, suburban or rural) and the frequency of occurrence of particular medical emergencies. There was also no significant difference between the number of medical emergencies experienced by a pharmacist during the course of their career and their particular location of practice. These results suggest that medical emergencies occur within community pharmacies at the same rate regardless of how urban or rural the location may be.

Location of Practice

Differences in the two efficacy scales were found for pharmacists based on whether they characterized their practice location as urban, suburban or rural. Significant differences were seen for both the self-efficacy and collective efficacy scales when comparing urban against rural pharmacists, with rural pharmacists having higher efficacy on both scales. Significant differences were also found between three of the components of the efficacy scales and

pharmacists' location of practice. With the exception of self-efficacy for BLS Skills, all of the other components (self-efficacy for Non-BLS Skills and both of the collective efficacy components) showed a difference between location of practice. Analysis of the mean efficacy values for each of the components shows an interesting trend, in that the values for urban pharmacists are the lowest, suburban pharmacists are in the middle, and rural pharmacists are the highest. This may be because urban pharmacists have a safety net of readily available EMS services and, thus, may not need to perform emergency skills, whereas rural pharmacists may be better prepared to deal with situations knowing that help could be further away.

Type of Practice

A significant difference was found between self-efficacy of pharmacists at independent pharmacies and pharmacists at a chain drug store. Independent pharmacists reported lower self-efficacy (71.16) than chain drug store pharmacists (79.51).

Unlike the relationship between location of practice and the four efficacy components, where everything was significant except for the self-efficacy for BLS Skills, the results were opposite when the relationship between the type of practice and the four efficacy components was examined. This analysis looked at whether efficacy for emergency medical situations varied based on the type of practice where the respondent pharmacist worked, i.e. independent, chain drug store, grocery with a pharmacy or retailer with a pharmacy. A significant difference was seen between independent pharmacies and the other groups. Mean efficacy for the self-efficacy for BLS Skills component was lower for independent pharmacy (40.53) than the other three groups, which were all relatively similar (47.65 for chain drug stores, 45.65 for grocery store pharmacies and 46.28 for retailer pharmacies).

The lower efficacy on the part of independent pharmacists may suggest one of several things. First, this may reflect a concern on the part of independent pharmacists that they may be

called upon to address an emergency medical situation, for which as an independent pharmacist they would be in charge of addressing. Second, there may be an absence of a larger corporate support structure to fall back on for policies or procedures on how to handle medical emergencies. Finally, it may suggest more concern for personal liability that might arise from taking action in a medical emergency.

Efficacy Based on Prior Medical Emergency Experience

Initially it was planned to compare both CPR experience and AED experience against the components of the efficacy scales. However, because only four pharmacists responded that they had used an AED before in an emergency situation, it was determined this was far too few to be sufficiently powered in order to run an analysis. However, it is believed that analysis is captured by the CPR experience measure because all four of those pharmacists who reported using an AED also reported having performed CPR in an emergency situation. To the extent CPR and AED performance measures prior experience in an emergency medical situation, it is believed that this experience was adequately covered by the CPR portion for purposes of determining efficacy, as one of the key components of efficacy is prior experience.

Self-efficacy was significantly difference between pharmacists who had performed CPR before and those who had not ($p = 0.035$). Self-efficacy for CPR experience was also significantly different for the second component of the self-efficacy scale, which is non-BLS skills. Means for the two groups showed that those with CPR experience reported higher self-efficacy for non-BLS training skills (34.08) than those who had not performed CPR (30.52). This is interesting as it suggests that prior experience with a medical emergency may increase overall self-efficacy for responding to medical emergencies, regardless of the training involved. However, a significant difference was not seen with respect to this component for the collective efficacy scale ($p = 0.091$).

Study Limitations

This study used a national community pharmacist panel and respondents were not offered any sort of incentive other than the satisfaction of participating in an academic study and the opportunity to obtain an executive summary of the findings from the study at its conclusion. There is a possibility of self-selection bias on the part of respondents, as given the subject matter of emergency medical situations, those pharmacists who had prior experience or an interest in this area may have been more likely to respond.

An additional limitation of this study may be recall bias on the part of the respondents. Pharmacists were asked to recall which emergency medical events had occurred and how many times. Although emergency medical situations are atypical stressful events that may be memorable, there is still the possibility that pharmacists were not able to recall if an event had occurred, or how many times they may have seen certain events.

A further limitation of this study is the cross-sectional design. Pharmacists were surveyed regarding both their emergency medical equipment on hand and their emergency medical training, as well as their prior experience with emergency medical situations. What cannot be determined from this data is whether prior experience with medical emergencies causes pharmacists and pharmacies to obtain additional equipment and training, such that those pharmacies that have had events become better prepared to address them in the future.

Directions for Future Research

This study was a preliminary assessment of community pharmacists' preparedness for addressing emergency medical situations. A number of additional directions could be pursued to follow up on this research. One line of inquiry concerns where and why pharmacists obtain their emergency medical training. For instance, there is the question of why pharmacists do not maintain their CPR training, particularly if it is not a job requirement. There is also the question

for those pharmacists who obtain more specialized training as to where and why they obtain it. In particular, it would be interesting to see if this training was obtained as part of a residency or whether it was obtained subsequent to education/residency. Additionally, pharmacists who have had community pharmacy residencies could be asked about what type of emergency medical training they are required to have or obtain, particularly to contrast this with health-system residencies that sometimes do require or offer ACLS and PALS.

Finally, although this study assessed pharmacist's self-efficacy and collective efficacy in addressing emergency medical situations, an additional area of study could be pharmacists' willingness to actually respond to these medical situations. Similarly, pharmacies also have a number of medications on hand that could be used in emergency medical situations. An additional direction could be pharmacists willingness to provide these medications to patients in need without a pre-existing protocol for administration in place.

Implications

The findings of the study suggest that pharmacists are somewhat prepared to address emergency medical situations, although there is more that could be done. Most pharmacists are trained in CPR and a majority are trained in BLS, but it appears that some pharmacists are letting their certification lapse with time. Other than ACLS and PALS, other emergency medical training is rare. Given that medical emergencies are occurring in pharmacists, an Emergency Responder course may be beneficial. Additionally, although most pharmacies have basic equipment such as a first aid kit and gloves, very few pharmacies (<10%) have AEDs available. As a majority of pharmacists are trained to operate AEDs, it would make sense for community pharmacies to look into acquiring these devices.

LIST OF REFERENCES

American Heart Association, Inc. ACLS Advanced Cardiac Life Support [Internet]. Dallas, TX; American Heart Association, Inc.; c2014 [cited 2014 Apr 27]. Available from http://www.heart.org/HEARTORG/CPRAndECC/HealthcareProviders/AdvancedCardiovascularLifeSupportACLS/Advanced-Cardiovascular-Life-Support ACLS_UCM_001280_SubHomePage.jsp

American Heart Association, Inc. BLS Basic Life Support [Internet]. Dallas, TX; American Heart Association, Inc.; c2014 [cited 2014 Apr 27]. Available from http://www.heart.org/HEARTORG/CPRAndECC/HealthcareProviders/BasicLifeSupportBLS/Basic-Life-Support-BLS_UCM_001281_SubHomePage.jsp.

American Heart Association, Inc. Friends & Family® CPR [Internet]. Dallas, TX; American Heart Association, Inc.; c2014 [cited 2014 Apr 27]. Available from http://www.heart.org/HEARTORG/CPRAndECC/CommunityCPRandFirstAid/ CommunityProducts/Family-Friendsreg-CPR_UCM_303576_Article.jsp

American Heart Association, Inc. Heartsaver Courses [Internet]. Dallas, TX; American Heart Association, Inc.; c2014 [cited 2014 Apr 27]. Available from http://www.heart.org/ HEARTORG/CPRAndECC/CorporateTraining/HeartsaverCourses/HeartsaverCourses_UCM_001295_SubHomePage.jsp

American Heart Association, Inc. Pediatric Advanced Life Support [Internet]. Dallas, TX; American Heart Association, Inc.; c2014 [cited 2014 Apr 27]. Available from http://www.heart.org/HEARTORG/CPRAndECC/HealthcareProviders/Pediatrics/Pediatric-Advanced-Life-Support-PALS_UCM_303705_Article.jsp

American Red Cross [internet]. Washington, DC; American Red Cross; c2014 [cited 2014 Apr 27]. Available from http://www.redcross.org/.

American Society of Health-System Pharmacists, ASHP Statement on Pharmacy Services to the Emergency Department; 2007 [cited 2014 Apr 27]. Available from http://www.ashp.org/s_ashp/docs/files/BP_Pharm_Role_ED-D11.pdf.

American Society of Health-System Pharmacists, ASHP Guidelines on Emergency Medicine Pharmacist Services, Medication Therapy and Patient Care: Specific Practice Areas – Guidelines, 304- 314 (2011).

Bandura A. Exercise of Human Agency Through Collective Efficacy. Current Directions in Psychological Science 2000;9(3):75-78.

Bandura A. Self-efficacy: Toward a Unifying Theory of Behavioral Change. Psychological Review 1977;82(2):191-215.

Barbaranelli C, Capanna C (2001). Efficacia personale e collettiva nelle associazioni di volontariato socio assistenziale. In G. V. Caprara (Ed.), La valutazione dell'autoefficacia (pp. 147–156). Trento: Erickson.

Brown, S. Pharmacist saves child with CPR [Internet]. La Grange (GA): La Grange News; 2011 [cited Aug 8, 2013]. Available from http://lagrangenews.com/view/ full_story/17273616/ article-Pharmacist-saves-child-with-CPR.

Cohen V, Jellinek SP, Hatch A, Motov S. Effect of Clinical Pharmacists on Care in the Emergency Department: A Systematic Review. Am. J. Health-Syst. Pharm. 2009;66:1353-61.

DelMonte MT, Clark JS. Pharmacy Residents' Experiences and Attitudes Toward Participation in Cardiopulmonary Resuscitation (CPR) Events at Academic Medical Centers. Hosp. Pharm. 2011;46(11): 864-75.

Dillman DA, Smyth JD, Christian LM. Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method 3rd rev. ed. Hoboken (NJ): Wiley; 2009. 499 p.

Emergency Medical Services Systems Act of 1973, Pub. L. 93-154 (1973).

Fairbanks RJ, Hays DP, Webster DF, Spillane LL. Clinical Pharmacy Services in an Emergency Department. Am. J. Health-Syst. Pharm 2004;61:934-7.

Fairbanks RJ, Rueckmann EA, Kolstee KE, Hays DP, Cobaugh DJ, Wears RL, Dewar KH, Martin HA, Davis CO, Schneider SM. Clinical pharmacists in emergency medicine. In: Henricksen K, Battles JB, Keyes MA, Grady ML, eds. Advances in patient safety: new directions and alternative approaches. Vol. 4. Technology and Medication Safety (AHRQ Publication Number: 08-0034-4). Rockville, MD: Agency for Healthcare Research and Quality, August, 2008. Available at: http://www.ahrq.gov/downloads/ pub/advances2/vol4/Advances-fairbanks_20.pdf.

Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate Data Analysis. 7th ed. Upper Saddle River (NJ): Prentice Hall; 2010. 785 p.

Hanefeld C, Lichte C, Mentges-Schroter I, Sirtl C, Mugge A. Hospital-wide first-responder automated external defibrillator programme: 1 year experience. Resuscitation 2005;66:167-70.

Highway Safety Act, 23 U.S.C. § 402 (1966).

Immunization Action Coalition. States allowing pharmacists to vaccinate [Internet]. St. Paul, MN; Immunization Action Coalition; c2009 (cited 2013 Mar 15). Available from www.immunize.org/laws/pharm.asp.

Japsen, B. How Flu Shots Become Big Sales Booster for Walgreens, CVS [Internet]. Forbes.com LLC; c2013 (cited 2013 Mar 15). Available from http://www.forbes.com/sites/ brucejapsen/2013/02/08/how-flu-shots-became-big-sales-booster-for-walgreen-cvs/

Machado C, Barlows TG, Marsh WA, Coto-DePani Y, Dalin G. Pharmacists on the Emergency Cardiopulmonary Resuscitation Team: Their Responsibilities, Training and Attitudes. Hosp Pharm 2003;38(1):40-49.

Martin BA, Chui MA, Thorpe JM, Mott DA, Kreling DH. Development of a scale to measure pharmacists' self-efficacy in performing medication therapy management services. Res in Soc and Admin Pharm 2010;6:155-61

McCall KL, Supernaw R. Survey of Basic Life Support Training in U.S. Schools and Colleges of Pharmacy, Am. J. of Pharm. Educ. 2002;66:271-72.

National Academy of Sciences, National Research Council. Accidental Death and Disability: The Neglected Disease of Modern Society. Washington DC; National Academy Press; 1966. 40 p.

National Highway Traffic Safety Administration, United States Health and Human Services Public Health Services, Health Resources and Services Administration Maternal and Child Health Bureau. Emergency Medical Services Agenda for the Future. Washington DC; National Highway Traffic Safety Administration, Department of Transportation (US); 1996 Aug, 87 p. Report No.: DOT HS 808 441.

National Highway Traffic Safety Administration. National EMS Scope of Practice Model. Washington, DC; National Highway Traffic Safety Administration, Department of Transportation (US); 2007 Feb. 42 p. Report No.: DOT HS 810 657.

National Highway Traffic Safety Administration, United States Health and Human Services Public Health Services, Health Resources and Services Administration Maternal and Child Health Bureau. Emergency Medical Services Education Agenda for the Future: A Systems Approach. Washington DC; National Highway Traffic Safety Administration, Department of Transportation (US); 2000. 57 p.

National Highway Traffic Safety Administration. National EMS Scope of Practice Model. Washington, DC; National Highway Traffic Safety Administration, Department of Transportation (US); 2007 Feb. 42 p. Report No.: DOT HS 810 657.

National Highway Traffic Safety Administration. National EMS Scope of Practice Model. Washington, DC; National Highway Traffic Safety Administration, Department of Transportation (US); 2007 Feb. 42 p. Report No.: DOT HS 810 657.

National Registry of Emergency Medical Technicians [Internet]. Columbus, Ohio; National Registry of Emergency Medical Technicians; c2014 [cited 2014 Apr 27]. Available from http://www.nremt.org/.

Odedina FT, Hepler CD, Segal R, Miller D. The Pharmacists' Implementation of Pharmaceutical Care (PIPC) Model. Pharm Res 1997;14(2):135-44.

Omnibus Reconciliation Act of 1981, Pub. L. 97-35 (1981).

Oregon Health Authority, Immunization Protocol for Pharmacists, Guidelines for Managing Severe Adverse Events (2010)

Pedersen CA, Canaday BR, Ellis WM, Keyes EK, Pietrantoni A, Rothholz MC, Thomas CC, Tong TG, Tonrey LL, Tucker TL. Pharmacists' Opinions Regarding Level of Involvement in Emergency Preparedness and Response. J Am Pharm Assoc 2003;43:694-701.

Setlak P. Bioterrorism preparedness and response: Emerging role for health-system pharmacists. Am J Health-Syst Pharm. 2004;61:1167-75.

Shimp LA, Mason NA, Toedter NM, Atwater CB, Gorenflo DW. Pharmacist participation in cardiopulmonary resuscitation. Am J Health-Syst Pharm 1995;52(9):980-984.

Toma MB, Winstead PS, Smith KM, Lewis DA, Clifford TM. Pharmacy resident participation in cardiopulmonary resuscitation events. Am J Health-Syst Pharm 2007;64: 747-53.

United States Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook: Healthcare, Pharmacists. C2012 [cited 2013 Aug 17]. Available from http://www.bls.gov/ooh/Healthcare/Pharmacists.htm.

Woodard LJ, Bray BS, Williams D, Terriff CM. Call to action: Integrating student pharmacists, faculty, and pharmacy practitioners into emergency preparedness and response. J Am Pharm Assoc 2010;50(2):158-164.

APPENDIX

APPENDIX A

SURVEY

Pharmacists' Preparedness for Acute Medical Emergencies Survey

Q1 Welcome to the Community Pharmacy Emergency Preparedness Survey Thank you for participating in our survey! This survey is being conducted by a graduate student, James Parrett, for his Master's thesis under the direction of Dr. Erin Holmes, with the University of Mississippi Department of Pharmacy Administration. In this survey we are interested in learning about your experience with medical emergencies that may occur within your pharmacy. We appreciate your helping the field of pharmacy through your answers. We hope it will take approximately 15 minutes to respond to this survey. As a community pharmacist, you are the best (and perhaps only) source of this valuable information and your input may help other pharmacies deal with emergency medical situations that may arise. Therefore, your patience in answering the questions honestly and carefully is valued. To move through the survey, please click the >> at the bottom of the screen. Statement of Consent I have read the above information. By continuing to the next screen, I consent to participate in the study.

Q2 Are you a community pharmacist?

- ❍ Yes (1)
- ❍ No (2)

Q3 What is your primary area of practice in pharmacy? (please check only one)

- ❍ Independent Pharmacy (1)
- ❍ Chain Drug Store (e.g. CVS, Walgreens, Rite-Aid, etc.) (2)
- ❍ Grocery store with a pharmacy (e.g. Kroger, Giant Food, etc.) (3)
- ❍ Retailer with a pharmacy (e.g. Target, Wal-Mart, etc.) (4)
- ❍ Other (please specify below) (5) _____

Q4 How would you characterize your position in the pharmacy in which you are primarily employed? (please check only one)

- ❍ Staff pharmacist / Relief pharmacist / Floater pharmacist (1)
- ❍ Pharmacy manager / Pharmacist in charge (2)
- ❍ District Manager (3)
- ❍ Regional Manager (4)
- ❍ Pharmacy owner (5)
- ❍ Other (please specify below) (6) _____

Q5 How many years have you been practicing pharmacy?

Q6 How long have you worked at your current pharmacy? (please enter whole numbers below)

Years (1)

Months (2)

Q7 In which state do you currently practice pharmacy?

- ❍ Alabama (1)
- ❍ Alaska (2)
- ❍ Arizona (3)
- ❍ Arkansas (4)
- ❍ California (5)
- ❍ Colorado (6)
- ❍ Connecticut (7)
- ❍ Delaware (8)
- ❍ District of Columbia (9)
- ❍ Florida (10)
- ❍ Georgia (11)
- ❍ Guam (12)
- ❍ Hawaii (13)
- ❍ Idaho (14)
- ❍ Illinois (15)
- ❍ Indiana (16)
- ❍ Iowa (17)
- ❍ Kansas (18)
- ❍ Kentucky (19)
- ❍ Louisiana (20)
- ❍ Maine (21)
- ❍ Maryland (22)
- ❍ Massachusetts (23)
- ❍ Michigan (24)
- ❍ Minnesota (25)
- ❍ Mississippi (26)
- ❍ Missouri (27)
- ❍ Montana (28)
- ❍ Nebraska (29)
- ❍ Nevada (30)
- ❍ New Hampshire (31)
- ❍ New Jersey (32)
- ❍ New Mexico (33)
- ❍ New York (34)
- ❍ North Carolina (35)
- ❍ North Dakota (36)
- ❍ Ohio (37)
- ❍ Oklahoma (38)
- ❍ Oregon (39)
- ❍ Pennsylvania (40)
- ❍ Puerto Rico (41)

- ❍ Rhode Island (42)
- ❍ South Carolina (43)
- ❍ South Dakota (44)
- ❍ Tennessee (45)
- ❍ Texas (46)
- ❍ Utah (47)
- ❍ Vermont (48)
- ❍ Virginia (49)
- ❍ Virgin Islands (50)
- ❍ Washington (51)
- ❍ West Virginia (52)
- ❍ Wisconsin (53)
- ❍ Wyoming (54)

Q8 Which of the following best describes the location where you practice pharmacy?
- ❍ Urban (1)
- ❍ Suburban (2)
- ❍ Rural (3)

Q9 In which zip code is your pharmacy located?

Q10 Which of the following degrees have you earned? (Please check all that apply)
- ☐ Bachelor of Science in Pharmacy (B.S. Pharm.) (1)
- ☐ Doctor of Pharmacy (Pharm.D.) (2)
- ☐ Master of Science (M.S.) (3)
- ☐ Doctor of Philosophy (Ph.D.) (4)
- ☐ Other (please specify below) (5) _____

Q11 In what year did you graduate with your pharmacy degree?

Q12 Are you male or female?

- ❍ Male (1)
- ❍ Female (2)

Q13 How old are you?

Q14 What is your race? (please select only one)

- ❍ African-American (1)
- ❍ American Indian / Alaska Native (2)
- ❍ Asian (3)
- ❍ Native Hawaiian / Pacific Islander (4)
- ❍ White (5)
- ❍ Multiracial (6)

Q15 Have you ever been certified in cardiopulmonary resuscitation (CPR)?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To Have you ever performed CPR on a person?

Q16 From which organization did you obtain your CPR training?

- ❍ American Heart Association (1)
- ❍ American Red Cross (2)
- ❍ I'm not sure (3)

Q17 Which of the following certifications do you currently hold? (please check all that apply)

- ❑ CPR/Basic Life Support Training (e.g. American Heart Association or American Red Cross) (1)
- ❑ Advanced Cardiac Life Support (ACLS) (2)
- ❑ Pediatric Advanced Life Support (PALS) (3)
- ❑ First Responder (4)
- ❑ Emergency Medical Technician - Basic (EMT-B) (5)
- ❑ Emergency Medical Technician - Intermediate (EMT-I) (6)
- ❑ Advanced Emergency Medical Technician (AEMT) (7)
- ❑ Paramedic (EMT-P) (8)
- ❑ None of the above (9)

Q18 Have you ever performed CPR on a person?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To Which of the following emergency medi...

Q19 How many times have you performed CPR on a person?

Q20 If you would care to describe the experience(s), please feel free to do so below:

Q21 Which of the following emergency medical equipment does your pharmacy have available for use in an emergency? (please check all that apply)

- ❑ Gloves (1)
- ❑ First aid kit (2)
- ❑ Pocket mask (3)
- ❑ Microshields (4)
- ❑ Bag valve mask (5)
- ❑ Epi Pen (6)
- ❑ Glucagon Emergency Kit (7)
- ❑ None of the above (8)

Q22 Does your pharmacy have an automated external defibrillator (AED)?

- ❍ Yes (1)
- ❍ No (2)

Q23 Are you currently certified to operate an AED?

- ❍ Yes (1)
- ❍ No (2)

Q24 Have you ever used an AED on a person?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To Are you required by your pharmacy to ...

Q25 How many times have you used an AED on a person?

Q26 If you would care to describe the experience(s), please feel free to do so below:

Q27 Are you required by your pharmacy to be certified in either CPR or the use of an AED?

- ❍ No (1)
- ❍ Yes, CPR only (2)
- ❍ Yes, both CPR and AED use (3)
- ❍ I'm not sure (4)
- ❍ Other (please explain below) (5) _____

Q28 Are other members of your pharmacy required to be certified in either CPR or the use of an AED?

- ❍ No (1)
- ❍ Yes, CPR only (2)
- ❍ Yes, both CPR and AED use (3)
- ❍ I'm not sure (4)
- ❍ Other (please explain below) (5) _____

If Yes, CPR only Is Selected, Then Skip To Click to write the question textIf Yes, both CPR and AED use Is Selected, Then Skip To Click to write the question text

Q29 Which members of your pharmacy are required to be certified? (please check all that apply)

- ❑ Other pharmacists (1)
- ❑ Pharmacy Technicians (2)
- ❑ Clerks (3)
- ❑ Cashiers (4)
- ❑ Front sales personnel (5)
- ❑ Interns or Externs (6)
- ❑ Students on rotation (7)
- ❑ I'm not sure (8)
- ❑ None of the above (9)

Q30 Does your pharmacy have a policy for how to respond to medical emergencies that occur at the pharmacy?

- ❍ No (1)
- ❍ Yes (please feel free to provide details below) (2) _____

Q31 Has there ever been an emergency situation at your pharmacy that needed someone to perform CPR, rescue breathing or use an AED?

- ❍ Yes (please describe below): (1) _____
- ❍ No (2)

Q32 Which of the following medical emergencies, if any, have occurred within your pharmacy? (please check all that apply)

	Has this happened?		How many times?
	Yes (1)	No (2)	Enter # here (1)
Heart attack / acute myocardial infarction (1)	❍	❍	
Difficulty breathing (e.g. choking) (2)	❍	❍	
Asthma exacerbation (3)	❍	❍	
Unconsciousness / Unresponsiveness/Fainting (4)	❍	❍	
Severe bleeding or trauma (5)	❍	❍	
Anaphylaxis / allergic reaction (6)	❍	❍	
Diabetic emergency (7)	❍	❍	
Seizure (8)	❍	❍	
Other (please describe below) (9)	❍	❍	

Q33 Since the time you started practicing as a pharmacist, how many medical emergencies have occurred within your pharmacy?

Q34 Approximately how often do medical emergencies occur within your pharmacy?

- ❍ Never (1)
- ❍ Less than every two years (2)
- ❍ Every two years (3)
- ❍ Once a Year (4)
- ❍ Several Times a Year (5)
- ❍ Once a Month (6)
- ❍ Once a Week (7)
- ❍ More than once a week (8)

Q35 Below are statements that you may agree or disagree with concerning medical emergencies. For the purposes of these items, a medical emergency is one in which immediate action is needed to address a serious or life-threatening situation, such as a heart attack, respiratory distress or unconsciousness. Using the scale below, indicate your level of agreement with each item.

	Strongly Disagree 1 (1)	Disagree 2 (2)	Slightly Disagree 3 (3)	Neither Agree nor Disagree 4 (4)	Slightly Agree 5 (5)	Agree 6 (6)	Strongly Agree 7 (7)
I feel confident in my ability to perform CPR in an emergency situation in my pharmacy. (1)	❍	❍	❍	❍	❍	❍	❍
I feel confident in my ability to use and AED in an emergency situation in my pharmacy. (2)	❍	❍	❍	❍	❍	❍	❍
I feel confident in my ability to perform rescue breathing in an emergency situation in my pharmacy. (3)	❍	❍	❍	❍	❍	❍	❍
I feel confident in my ability to help someone who is	❍	❍	❍	❍	❍	❍	❍

choking in my pharmacy. (4)							
I feel confident in my ability to help someone who is bleeding profusely in my pharmacy. (5)	❍	❍	❍	❍	❍	❍	❍
My emergency training has sufficiently prepared me to effectively perform CPR. (6)	❍	❍	❍	❍	❍	❍	❍
My emergency training has sufficiently prepared me to effectively use an AED. (7)	❍	❍	❍	❍	❍	❍	❍
My emergency training has sufficiently prepared me to effectively perform rescue breathing. (8)	❍	❍	❍	❍	❍	❍	❍
My emergency	❍	❍	❍	❍	❍	❍	❍

training has sufficiently prepared me to effectively help someone who is choking. (9)							
My emergency training has sufficiently prepared me to effectively help someone who is bleeding profusely. (10)	❍	❍	❍	❍	❍	❍	❍
I can still remember enough of my CPR training so that I can use it. (11)	❍	❍	❍	❍	❍	❍	❍
I am confident I could effectively respond to a medical emergency that took place in my pharmacy. (12)	❍	❍	❍	❍	❍	❍	❍
I can remain calm when addressing a medical emergency in my	❍	❍	❍	❍	❍	❍	❍

pharmacy. (13)							
If there were a medical emergency in my pharmacy, I am confident I could handle the situation. (14)	❍	❍	❍	❍	❍	❍	❍
I feel stressed when a medical emergency occurs in my pharmacy. (15)	❍	❍	❍	❍	❍	❍	❍
I feel prepared to deal with medical emergencies that may arise in my pharmacy. (16)	❍	❍	❍	❍	❍	❍	❍
I am worried about having to deal with medical emergencies that might occur in my pharmacy. (17)	❍	❍	❍	❍	❍	❍	❍
My employer would expect me to take the	❍	❍	❍	❍	❍	❍	❍

lead in responding to medical emergencies that occur within my pharmacy. (18)							
My co-workers would expect me to take the lead in responding to medical emergencies that occur within my pharmacy. (19)	❍	❍	❍	❍	❍	❍	❍

Q36 Below are statements that you may agree or disagree with concerning your pharmacy and co-workers responding to medical emergencies. For the purposes of these items, a medical emergency is one in which immediate action is needed to address a serious or life-threatening situation, such as a heart attack, respiratory distress or unconsciousness. Using the scale below, indicate your agreement with each item.

	Strongly Disagree 1 (1)	Disagree 2 (2)	Slightly Disagree 3 (3)	Neither Agree nor Disagree 4 (4)	Slightly Agree 5 (5)	Agree 6 (6)	Strongly Agree 7 (7)
My pharmacy can effectively manage an emergency medical situation. (1)	❍	❍	❍	❍	❍	❍	❍
My pharmacy is prepared to deal with medical emergencies that occur within it. (2)	❍	❍	❍	❍	❍	❍	❍
My pharmacy co-workers and I can effectively work together to perform CPR. (3)	❍	❍	❍	❍	❍	❍	❍
My pharmacy co-workers and I can effectively work together to use an AED. (4)	❍	❍	❍	❍	❍	❍	❍
My pharmacy co-workers and I can effectively work together to perform	❍	❍	❍	❍	❍	❍	❍

rescue breathing. (5)							
My pharmacy co-workers and I can effectively work together to help someone who is choking. (6)	❍	❍	❍	❍	❍	❍	❍
My pharmacy co-workers and I can effectively work together to help someone who is bleeding profusely. (7)	❍	❍	❍	❍	❍	❍	❍
My pharmacy would be able to effectively work with rescue personnel in addressing medical emergencies. (8)	❍	❍	❍	❍	❍	❍	❍
I can rely on my co-workers to do their part in addressing a medical emergency. (9)	❍	❍	❍	❍	❍	❍	❍
My co-workers and I would work well together	❍	❍	❍	❍	❍	❍	❍

in crisis situations. (10)							
My pharmacy has a policy for addressing how to manage medical emergencies. (11)	❍	❍	❍	❍	❍	❍	❍
My pharmacy encourages its employees to be prepared for medical emergencies (12)	❍	❍	❍	❍	❍	❍	❍
My pharmacy offers opportunities for training and refresher courses in CPR or other emergency management. (13)	❍	❍	❍	❍	❍	❍	❍

Q37 For the following statements, please answer them in the context of a medical emergency happening at your pharmacy (i.e. a life-threatening condition that requires immediate intervention). For each of the statements, please indicate your choice that is closest to how true you think this statement is for you by putting the appropriate number in the blank beside each statement. The questions ask about your opinion. There are no right or wrong answers.

	Not at all True 1 (1)	Hardly True 2 (2)	Moderately True 3 (3)	Exactly True 4 (4)
I can always manage to solve difficult problems if I try hard enough. (1)	❍	❍	❍	❍
If someone opposes me, I can find the means and ways to get what I want. (2)	❍	❍	❍	❍
It is easy for me to stick to my aims and accomplish my goals. (3)	❍	❍	❍	❍
I am confident that I could deal efficiently with unexpected events. (4)	❍	❍	❍	❍
Thanks to my resourcefulness, I know how to handle unforeseen situations. (5)	❍	❍	❍	❍
I can solve most problems if I invest the necessary effort. (6)	❍	❍	❍	❍
I can remain calm when facing difficulties because I can rely on my coping abilities. (7)	❍	❍	❍	❍
When I am confronted with a problem, I can	❍	❍	❍	❍

usually find several solutions. (8)				
If I am in trouble, I can usually think of a solution. (9)	❍	❍	❍	❍
I can usually handle whatever comes my way. (10)	❍	❍	❍	❍

APPENDIX B

COVER LETTER

Cover email:

Dear Pharmacist:

We are pleased to be assisting with an online survey as part of a thesis project for a pharmacy student at The University of Mississippi School of Pharmacy. Please join us in supporting this pro-bono research study by clicking the link below to see if you qualify. Your time and input is very important in helping him complete his thesis. Thank you in advance for your generosity and help.

At the end of the project we will provide you with a summary of the results of this survey in appreciation for your time.

Robert Barnello, Manager, Research Operations
Delta Marketing Dynamics
(800) 492-4516

NOTE FROM STUDENT:

You have been selected to be part of an important study concerning emergency medical situations in community pharmacies. In this survey we are interested in learning about your experience with medical emergencies that may occur within your pharmacy. This survey is being conducted by James Parrett, a graduate student in the University of Mississippi Department of Pharmacy Administration, as his Master's thesis, under the direction of Dr. Erin Holmes.

Only the research team working on this Master's thesis project will have access to the data for analyzing and interpreting the results. The responses to this survey will be kept confidential. This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). Our IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. You participation is voluntary and there are no consequences for choosing not to participate. However, we are asking that you please complete each question so that we can obtain full responses. If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at **662-915-7482**. If you have any questions about this project, please contact Dr. Erin Holmes, faculty in the department of Pharmacy Administration at the University of Mississippi at **662-915-5914**.

The completion of the survey should not take more than fifteen minutes of your time. Following this link (or cut and paste it) will take you to the survey and further instruction will be given:

Follow This Link to the Survey:
Or Copy and Paste the following Link in your internet browser:

Please complete the survey as soon as possible. As a community pharmacist, you are the best (and perhaps only) source of this valuable information and your input may help other pharmacies deal with emergency medical situations that may arise. Therefore, your patience in answering the questions honestly and carefully is valued.

Sincerely,
James Parrett

VITA

James W. Parrett, Jr. graduated from James Madison University in 1997 with a B.S. in Chemistry. Mr. Parrett later pursued a degree in law, and graduated from the College of William and Mary with a Juris Doctor degree in 2002. Following graduation, he accepted a position as an associate at the law firm Morris, Nichols, Arsht & Tunnell in Wilmington, DE. Mr. Parrett practiced pharmaceutical patent law for eight years, representing branded pharmaceutical companies in Hatch Waxman litigation. He was also active in the Delaware legal community, serving as President of the Delaware Federal Bar Association for two years. He was also active in numerous other local and national legal organizations, and volunteered for Delaware Volunteer Legal Services and for the Office of the Child Advocate. Mr. Parrett was awarded the *Caleb R. Layton, III Service Award* in 2008 and the Distinguished Service Award in 2009 by the United States District Court for the District of Delaware.

Mr. Parrett subsequently returned to school to pursue a graduate degree in Pharmacy Administration from the University of Mississippi, School of Pharmacy. Mr. Parrett is also a full-time student in the University of Mississippi School of Pharmacy Professional Program, where he graduated with his B.S. in Pharmaceutical Sciences in 2013. Mr. Parrett in active in several pharmacy organizations, including the American Pharmacists Association, the American Society of Health-System Pharmacists, and the Rho Chi Society. Mr. Parrett is also an active member of the student government of the University of Mississippi, serving on both the Associated Student Body Campus Senate and the Graduate Student Council Senate. Mr. Parrett was awarded the Teaching Assistant of the Year Award and the Friend of the Student Award in

2012 by the University of Mississippi School of Pharmacy, and was voted the Associated Student Body Senator of the Year Award in 2013.