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School Policy and Practice to Tackle a Public Health Problem: Sudden Cardiac Arrest

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SCHOOL POLICY AND PRACTICE TO TACKLE
A PUBLIC HEALTH PROBLEM:
SUDDEN CARDIAC ARREST

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Education

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College of Education and Behavioral Sciences
Department of Leadership, Policy and Development:
Higher Education and P-12 Education
Educational Leadership and Policy Studies

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Entitled: *School Policy And Practice To Tackle A Public Health Problem: Sudden Cardiac Arrest*

has been approved as meeting the requirement for the Degree of Doctor of Education in College of Education and Behavioral Sciences, Educational Leadership and Policy Studies Program

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ABSTRACT

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Sudden cardiac arrest (SCA) is a leading cause of death in the United States. While the medical research has exhaustively documented that immediate response directly impacts survival rates in SCA and that schools could be the best catalyst for creating change by bystanders, there is little to no educational research addressing school policy or practices in regards to cardiac emergencies in schools. The purpose of this dissertation was to identify and describe characteristics of the Colorado schools that offer cardiopulmonary resuscitation (CPR) training and onsite automated external defibrillators (AED). Two research questions were answered, Of respondents, what are the characteristics of schools that provide CPR training? Of respondents, what are the characteristics of schools that have an on-site AED? This dissertation was a quantitative study with survey design as the methodology. Participants for the study were Colorado school leaders. The survey collection method was electronic questionnaire. Data analysis was descriptive statistics. The data analysis described trends associated with school characteristics to CPR training and AED availability at responding schools. These trends indicated a need for further research of CPR training and AED availability in Colorado schools.

Keywords: sudden cardiac arrest (SCA), cardiopulmonary resuscitation (CPR), automated external defibrillator (AED), school crisis planning, health education

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CHAPTER I

INTRODUCTION

Wes Leonard, 16, died of cardiac arrest while playing basketball last Thursday…
His wasn't the only sudden death among sports-playing U.S. high schoolers in
the last two weeks. Matthew Hammerdorfer, 17, died playing rugby in Fort
Collins, Colorado, due to cardiac arrest from a congenital heart defect. In North
Carolina, 16-year-old Javaris Brinkley died of heart failure after playing basketball
at a church Monday; and 17-year-old soccer and track star Sarah Landauer of
Gainesville, Florida, collapsed at track practice; she died Wednesday…Although
four deaths in two weeks may seem like a lot, it's consistent with the national
average for scholastic athletes, it does draw attention to questions that have
been looming for years (Landau, 2011, p. 1).

School safety is a priority concern for educational leaders. According to

the Colorado Association of School Boards (CASB, 2011) schools must establish

a crisis management policy, which includes response to medical emergencies. "A

crisis management policy…sets forth written procedures for taking action and

communicating with local law enforcement agencies, community emergency

agencies, parents, students, and the media in the event of a crisis" (CASB, 2011,

p. 60). CASB recommendations emphasized that safety is essential for serving

students and stressed, "This [safe and supportive] community is powerful

because it fulfills student's basic needs for… physical security" (p. 59). Dr.

Sandra Smyser (2012), Colorado Superintendent of the Year in 2012, listed

safety procedures as a top consideration for the superintendency. Furthermore,

Colorado State Statute 22-32-109.1 (Colorado Safe Schools Act, 2012) requires

school districts to adopt the National Incident Management System (NIMS), which includes working closely with community first responders for ongoing training and implementation of written response plans. While compliance of crisis planning policy in schools is essential to staff and student safety, the requirement also provides school leaders an opportunity to view schools as an agent for collaboration with community organizations to address local, state, or national emergency health issues.

Environment Scan – A Macro Perspective

The purpose of schools is a topic of conversation. Nationally, schools have acted in the capacity of educating students regarding morals, citizenship, democracy, college preparation, and employment (Armstrong, 2006). Classical educational theorist, John Dewey (1916/2004) explained that education in its basic sense is used for transmission of societal norms. He wrote, "Society exists through a process of transmission quite as much as biological life. This transmission occurs by means of communication of habits of doing, thinking, and feeling from the older to the younger" (p. 3). While the transfer of mores in the rising generation occurs in many settings, including home, church, workplace, and community organizations; schools are attributed with a responsibility for common transmission of skills and understanding of citizenry (Dewey, 1916/2004). This civic duty allotted to schools has created tension regarding what concepts and skills are of greatest importance to be transmitted through the educational system, pushing dialogue and debate regarding the purpose of schools (Armstrong, 2006).

A National Conversation

Recent trends in discourse about the purpose of schools have shifted from institutions to educate citizens to participate in a democracy to a business designed to prepare students for the 21st century workplace (Armstrong, 2006). For educational leaders, understanding perceptions of the purpose of schools is imperative in promoting policy and practice in schools. Thomas Armstrong (2006) described the current debate as having two overarching themes, *academic achievement discourse* and *human development discourse*. Academic achievement discourse, promoted by the 2001 No Child Left Behind legislation, focuses primarily on training students to pass tests and earn good grades solely focused on academic content and skills (Armstrong, 2006). Dewey (1916/2004) warned society about education so narrowly defined, "There is the standing danger that the material of formal instruction will be merely the subject matter of the schools, isolated from the subject matter of life-experience. The permanent social interests are likely to be lost from view" (p. 5). Conversely, human development discourse emphasizes schools' obligation to support students' understanding of the real world and ultimately educating students on the skills and attributes needed to live independently in that world (Armstrong, 2006).

Human development discourse is founded on classical beliefs about educational purpose as a humanistic endeavor, educating the whole child and the student as citizen (Armstrong, 2006). Dating back to 1818, Thomas Jefferson, as cited by Armstrong (2006), wrote in the *Report of the Commissioners for the University of Virginia* a list of educational goals stating the need for a variety of

social endeavors as its focus. Of significance from Jefferson's list, was specificity about duty to neighbors and country as foundational to the American philosophy of education (Armstrong, 2006). Decades later, John Dewey (1916/2004, p. 43) argued that educational systems should readjust to social interests that have mutually interdependent needs or conditions. In addition, Armstrong (2006) specified, "…the National Education Association, in its 1918 report *Cardinal Principles of Secondary Education* detailed seven aims of education, including health" (p. 39).

Grounded in these founding principles, there remains a strong current to support schools as an institution to not only develop the child, academically, socially, emotionally, morally, and physically, but also as an a responsible citizen (Armstrong 2006; Kohn, 2008). Alfie Kohn (2008) suggested that the best schools promote cultures that understand the need and the importance for students to gain a sense of community and responsibility from school. He clarified, "students are helped to locate themselves in widening circles of care that extend beyond self…Opportunities are offered not only to learn about, but also to put into action, a commitment…to improving the lives of others" (Kohn, 2008, p. 2). Jenny Smith (2003), educational researcher and producer of award-winning public affairs documentaries for the Public Broadcasting Service, concurred:

> A partnership between education and public health also enhances the connection students feel toward their schools and communities. Youth learn their role in improving the health of the community by exploring current health concerns and developing authentic interventions. When students feel a strong sense of connection or belonging, they are generally more

committed and they behave more responsibly. This is an important stepping-stone toward becoming responsible, contributing members of society. (p. vi)

Across both historic and present discourse regarding the purpose of schools, promoting change for needed social issues, including public health and safety issues, intersects with the need for schools to develop responsible citizens (Armstrong, 2006; Dewey, 1916/2004; Kohn, 2008; Smith, 2003).

Applicability to Educational Leadership

Support for educating the citizenry necessitates school leaders to examine the scope of a school's participation in educating the citizenry beyond discrete skills in math and reading to broader understandings of national educational needs, such as those presented by public health issues (Smith, 2003). Briggs, Coleman and Morrison (2012) contended that the focus of educational research may seek to answer questions pertaining to, "The purposes of schools and schooling, and how is the school as a public institution interconnected with citizenship and democratic development?" and, "How are local, regional, national and international communities interconnected, what impact does this have on learners and staff, and why?" (p. 6). Assessing the purpose of schools as part of a collaborative effort to help educate and alleviate health related educational needs in the U.S. is a matter worthy of attention (Smith, 2003).

Specifically, school and community collaboration is a plausible solution to supporting increased outcomes for public health issues (Anderson & Lucia, 2009; Hazinski et al., 2004; Smith, 2003). Hazinski et al. (2004), authors of a policy

statement[1] for medical emergency response plans in schools, explained that schools are likely the most accessible public institution with a captive audience. Hazinski et al. (2004) stated, "On any given day, 20% of the U.S. adult and child population can be found in schools" (p. 166). The authors' (Hazinski et al., 2004) policy statement supported the notion that schools should be a primary location to help train citizens, adults and children alike, in appropriate response to support increased survival rates from medical emergencies. Schools are one of the nation's greatest community resources; schools exist for purposes far beyond instruction of the ABCs and arithmetic (Armstrong, 2006; Dewey 1916/2004; Kohn, 2008). Hence, schools should play a vital role in educating the citizenry on public awareness issues and in addressing serious public health issues (Smith, 2003). Correspondingly, the policies and practices of educational institutions should support these needs (Hazinski et al., 2004; Smith, 2003).

Anderson and Lucia (2009), researchers for the Sudden Cardiac Arrest Foundation (SCAF), posed this question, "Schools exist for the purpose of preparing young people for life; doesn't it make sense that schools themselves should be prepared to save a life?" (p. 2). Public health issues of varying types have been addressed in schools through health education and training of staff and students. Common issues addressed include substance abuse and

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[1] Endorsed by the American Heart Association, Emergency Cardiovascular Care Committee, American Academy of Pediatrics, American College of Emergency Physicians, American National Red Cross, National Association of School Nurses, National Association of State EMS Directors, National Association of EMS Physicians, National Association of Emergency Medical Technicians, the Program for School Preparedness and Planning, National Center for Disaster Preparedness, Columbia University Mailman School of Public Health, and reviewed by the Centers for Disease Control Division of School and Adolescent Health.

prevention, sexual health and sexual transmitted diseases, mental health and wellness, as well as a variety of physical health topics such as nutrition, obesity, AIDS, concussions, asthma, diabetes, and, in some cases, cardiac health and emergencies. Schools and school leaders as the facilitators for educating the citizenry with the capacity to impact the nation's largest public health issues, specifically sudden cardiac arrest (SCA), sometimes referred to as cardiac arrest, are the focus of this research proposal.

What Is Known About Sudden
Cardiac Arrest

Sudden cardiac arrest is a serious public health issue in the United States (Sudden Cardiac Arrest Association [SCAA], 2011) affecting more people than breast cancer, prostate cancer, colorectal cancer, AIDS, traffic accidents, house fires, and gunshot wounds combined (Figure 1). While SCA does not attract as much public attention as other health issues, people, regardless of age, gender, or ethnicity, lose their lives everyday due to this ailment (SCAA, 2011). The SCAA (2011) documented, "Sudden cardiac arrest is a leading cause of death in the U.S., killing more than 325,000 people each year" (p. 1). Despite its widespread impact, there is considerable misunderstanding about SCA (American Heart Association [AHA], 2014a). Many people believe sudden cardiac arrest is a pseudonym for a severe heart attack (AHA, 2014a), although these two health emergencies are quite different (Appendix A).
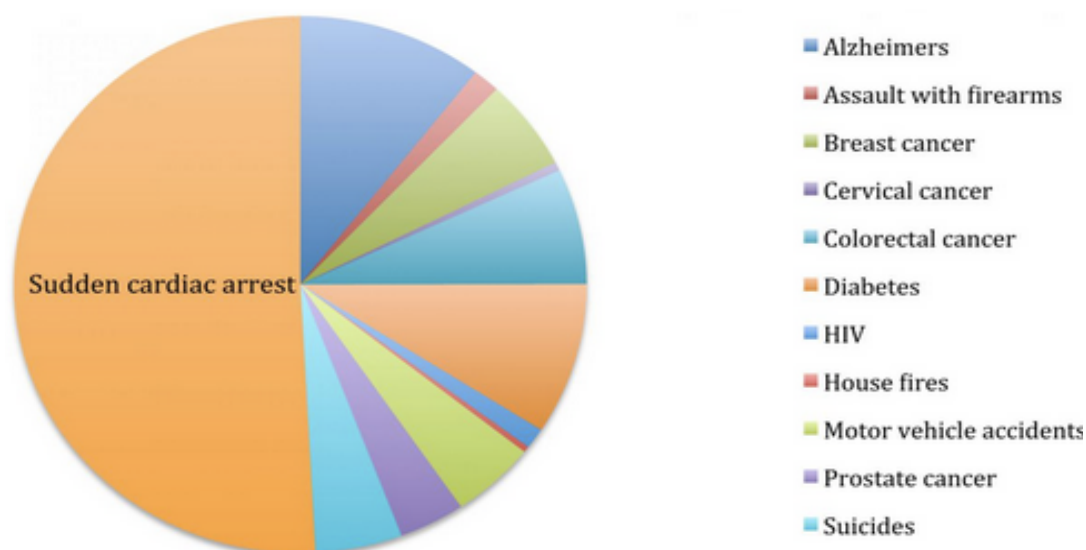
Figure 1. Most common annual incident of death in the United States. (Sudden Cardiac Arrest Foundation, SCAF, 2014)

Sudden cardiac arrest is a abrupt malfunction of the electrical impulses of the heart; patients lose consciousness immediately with virtually no warning signs. "Sudden cardiac arrest is a condition in which the heart suddenly and unexpectedly stops beating. If this happens, blood stops flowing to the brain and other vital organs. SCA usually causes death if it is not treated…within ten minutes" (Save a Life Pitkin County, 2012, p.1). Conversely, patients suffering from a heart attack usually have warning signs for some time, are conscious with a pulse, and can describe how they are feeling (Save a Life Pitkin County, 2012). Both of these emergencies require immediate medical care, but SCA takes most peoples' lives in just minutes from the onset of the event (Save a Life Pitkin County, 2012).

Sudden cardiac arrest may be due to known or unknown congenital heart conditions, most commonly an arrhythmia such as ventricular fibrillation, an enlarged heart known as cardiomyopathy, coronary artery or valvular heart

disease, or peripheral factors such as drug-induced reactions or sport-injury-induced arrests, such as commotio cordis (Mayo Clinic, 2014). Unlike heart attacks, SCA is rarely a condition of getting old, poor health, or dietary issues:

> Death from sudden cardiac arrest is not age, gender, or health-specific…'Every year, approximately 7,000 U.S. children are stricken, most often at school, because that's where kids spend the majority of their day—in class or in afterschool care or playing sports.' When it happens, child and teen victims are subject to the same scary statistics as their elders: Without immediate intervention, only 5%-10% will survive. (Anderson & Lucia, 2009, p. 14)

Sudden cardiac arrest is true to its name; its onset is abrupt and requires immediate attention. Yet, unlike diseases such as breast cancer or AIDS, the needed response to SCA is well understood and appropriate intervention can make survival likely (SCAA, 2011). The SCAF (2012) advised, "Without immediate intervention, the victim almost always dies…but 50% or more could survive" (p. 1). As a medical emergency that has known available treatment, a better understanding of the influence school and community collaboration, specifically health education policy and practices, can have on sudden cardiac arrest outcomes is necessary.

Research Problem

As the leading cause of death in the U.S., sudden cardiac arrest victims come from all age, gender, socio-economic, nationality, ethnic, and racial populations (SCAA, 2011). Sudden cardiac arrest is consequently a serious public health issue. In addition, there exist health inequities for survival rates, with higher rates of occurrence and lower bystander response rates for minority groups and impoverished victims of SCA (Sasson et al., 2013). Despite its high

fatality rates, the condition is less familiar to the public as other health disorders (SCAF, 2014). In the United States alone, SCA is the leading cause of death each year (Kochanek, Xu, Murphy, Miniño, & Kung, 2011; SCAA, 2011; SACF, 2014); these sudden deaths include 7,000 children (SCAF, 2014), with the most common location for these death occurring in schools (Anderson & Lucia, 2009, p. 14).

Comprehensive school crisis planning policy that includes practices that focus on addressing emergency response, skills training, and cardiac emergency awareness has the potential for life saving outcomes (Anderson & Lucia, 2009; Bosher, Kaminskia, & Vacca, 2004; Cave et al., 2011; CASB, 2011; Connolly, Toner, Connolly & McCluskey, 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014; Smith, 2003). Medical research has clearly indicated the skills and education needed to increase outcomes for SCA, yet results remain low, with average survival rates of 6-7% (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014). Consequently, there is a problem to be addressed; as the major educational institution of the country, K-12 schools, which collectively serve a vast majority of the population, have an obligation to address avoidable tragedies and death of citizens and children from sudden cardiac arrest. Despite extensive medical literature endorsing schools as the best location to address public awareness to counteract low survival rates from SCA (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Reder & Quan, 2003; SCAF,

2014), there is little to no educational research on the topic. Reder and Quan (2003) recommended, "Little is known about cardiopulmonary resuscitation (CPR) training in high schools…'the feasibility and effectiveness of school CPR training needs to be assessed" (p. 284). Hence, there is a documented need for educational research of this problem.

Purpose Statement and Research Questions

The purpose of this dissertation in educational research was two-fold. First, to collect data from Colorado schools regarding the implementation of recommended sudden cardiac arrest responses, specifically cardiopulmonary resuscitation training and automated external defibrillator (AED) accessibility. Second, to describe characteristics in the school organization regarding cardiac emergency practices and policy. Relationships between the descriptors of an organization such as perceptions, philosophy, program model, demographics, policy, and practice can provide insight into otherwise unnoticed influential factors at play that might influence the development and implementation of policy (Briggs et al., 2012). This dissertation adds to the body of educational research regarding possible identified trends between these types of descriptors and the practices for training staff and students in CPR. Findings in trends from this dissertation reveal potentially underlying equity issues otherwise unnoticed in public education institutions, in need of further investigation. As a purpose of educational research is to support the body of knowledge in both the field of educational policy and leadership, this research aimed to answer these questions:

Q1　　Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2　　Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

Definition of Terms

The following terms pertain to the research study as used in this dissertation. Specifically, the defined terms are associated with sudden cardiac emergency responses and training for these emergencies:

Automated External Defibrillator (AED)- A small computerized medical device that analyzes a person's heart rhythm. The AED is programmed to detect the type of heart rhythm that requires intervention. It includes simple instructions and automated voice directions. Used outside of the hospital setting, the AED gives an electrical shock called defibrillation to restart a person's heart, if needed. Using an AED within the first few minutes of SCA can reverse cardiac arrest and saves lives (Brown, 2013).

Bystander Response- The actions taken by those immediate to or witness in a crisis situation (AHA, 2013).

Cardiopulmonary resuscitation (CPR)- An emergency lifesaving procedure that is done when someone's breathing or heartbeat has stopped. CPR combines rescue breathing and chest compressions. Rescue breathing provides oxygen to the person's lungs. Chest compressions keep oxygen-rich blood flowing until the heartbeat and breathing can be restored. Permanent brain damage or death can occur within minutes if blood flow stops. Therefore, it is very important that blood flow and breathing be

continued until trained medical help arrives (MedlinePlus, 2014).

Chain of Survival- The critical actions required to treat life-threatening emergencies, including heart attack, cardiac arrest, stroke, and foreign body airway obstruction. The recommended steps or links within this Chain of Survival include, activation of the emergency response system, early CPR with an emphasis on chest compressions, rapid defibrillation, effective advanced life support, integrated post-cardiac arrest care (, 2013).

Commotio Cordis- A syndrome that results from a blunt impact to the chest that leads to cardiac arrest, often the cause in sports related sudden cardiac arrest of otherwise healthy athletes. Commotio cordis does not result solely from the force of a blow. It is largely the result of the exquisite timing of the blow during a narrow window within the repolarization phase of the cardiac cycle (Louis J. Acompora Memorial Foundation, 2013).

Emergency Medical Services (EMS)- The treatment and transport of people in crisis health situations that may be life threatening. Emergency medical support is applied in a wide variety of situations from car accidents to drownings to incidents of heart attack. EMS is the acronym for Emergency Medical Services (EMS1, 2014).

Sudden Cardiac Arrest (SCA)- The sudden, unexpected loss of heart function, breathing and consciousness. SCA usually results from an electrical disturbance in the heart that disrupts its pumping action, stopping blood flow to the rest of the body (Mayo Clinic, 2013a).

Survival Rate- The proportion of survivors in a group, e.g., of patients, studied

and followed over a period, or the proportion of persons in a specified

group alive at the beginning of a time interval who survive to the end of the

interval. It is often studied using life table methods (Reference M.D.,

2014).

Ventricular Fibrillation- A heart rhythm problem that occurs when the heart

beats with rapid, erratic electrical impulses. This causes pumping

chambers in the heart (the ventricles) to quiver uselessly, instead of

pumping blood. During ventricular fibrillation, blood pressure plummets,

cutting off blood supply to the vital organs. Ventricular fibrillation is the

most common cause of SCA (Mayo Clinic, 2013b).

Conclusion

According to data (Kochanek, Xu, Murphy, Miniño, & Kung, 2011) from

the U.S. vital statistics, sudden cardiac arrest is a medical emergency that takes

the lives of more Americans than any other condition (SCAA, 2011). In addition,

like many other health issues, minority and impoverished populations have

significantly decreased survival rates (Frieden, 2011; Sasson et al, 2013;

MedicineNet, 2013). Fortunately, the medical community has establish a body of

research that identifies the needed chain of survival to support increased

outcomes that includes call emergency medical services, initiate bystander

response, and employ an AED (Anderson & Lucia, 2009; AHA, 2013; Cave et al,

2011; Drezner etal, 2007; Estes, 2007; Hazinski et al., 2004; Lotfi et al., 2007;

SCAF, 2014). Medical researchers have also recommended that schools are

the best place to train citizens in the correct chain of survival response and skills

of CPR (Anderson & Lucia, 2009; AHA, 2011; AHA, 2014b, Cave et al., 2011;

Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al.,

2007; Reder & Quan, 2003; SCAF, 2014). Further, medical research has

demonstrated that immediate outcomes of increasing citizens knowledge and

skills to perform cardiopulmonary resuscitation in the event of sudden cardiac

arrest can create long-term outcomes of increased survival rates (Anderson &

Lucia, 2009; Cave et al, 2011; Connolly et al., 2007; Drezner et al., 2007; Estes,

2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014).

Still at issue has been the lack of educational research pertaining to

medical research recommendations for addressing SCA in schools including

implementation and capacity issues regarding school policy and practices

(Reder and Quan, 2003). In addition, through the lens of an educational leader's

obligation to support equity through educational policy and practice, the lack of

documentation regarding possible discrepancies in training of staff or students

from minority groups and impoverished schools as compared to schools of

affluence has leadership implications. While all schools are in need of supporting

better outcomes for public health needs (Hazinski et al., 2004; Smith, 2003),

such as sudden cardiac arrest, research that reveals possible discrepancies in

education for important health issues in impoverished and high minority schools

may be an indicator to promote legislative mandates for policy requiring CPR

training in schools.

Through educational research, processes can be revealed to support

school and community leaders to work together on public health issues, such as cardiac emergencies. Schools can potentially play a significant factor in implementing practices based on these policies that shift the outcomes of SCA (Anderson & Lucia, 2009; Cave et al, 2011; Connolly et al., 2007; Drezner et al., 2007; Estes, 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014). While medical research has exhaustively documented that immediate response directly impacts survival rates in sudden cardiac arrest and that schools could be the best catalyst for creating change by bystanders (Anderson & Lucia, 2009; Cave et al, 2011; Connolly et al., 2007; Drezner et al, 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014), there has been little to no educational research addressing health policy or practices in regards to cardiac emergencies in schools.

CHAPTER II

LITERATURE REVIEW

Addressing student safety and health, in and out of school, is a significant

aspect of school crisis planning and educational leadership responsibilities

(CASB, 2011; Colorado Safe Schools Act, 2012; Smyser, 2012). These current

educational issues, crisis emergency response and health education, intersect in

regard to the issue of cardiopulmonary resuscitation (CPR) and automated

external defibrillator (AED) training of staff and students in schools. Recent

attention by the media of high profile cases of children collapsing in schools or on

athletic fields have created greater attention to the occurrence of sudden cardiac

arrest (SCA) (Lotfi et al., 2007). The result of this attention in school crisis

planning is increased awareness of recommended responses of early CPR and

early defibrillation with an AED (Anderson & Lucia, 2009; Cave et al., 2011;

Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007;

Reder & Quan, 2003; Rice, 2013). A policymaking forum, the National

Conference of State Legislators (2013), reported, "State Legislators have

become actively involved with this issue in the past six years. Most commonly,

recent state laws encourage broader availability, rather than creating new

regulatory restrictions" (p. 1). Nationally, increased survival rates for out-of-

hospital sudden cardiac arrest due to bystander immediate response, in

particular initiation of CPR, have raised questions about the need to educate the

citizenry in these skills (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al. 2007; Hazinski et al., 2004; Landau, 2011; Lotfi et al., 2007; SCAF, 2014). Medical researchers Lotfi et al. (2007) supported the accepted medical community view that, through access and training of CPR, schools provide a setting for potential benefits to the greater community for addressing cardiac outcomes. Also, Anderson and Lucia (2009) advocated that an appropriate chain of response is well known to save lives, so, even at low incidence,[2] a comprehensive plan should be adopted by schools that may potentially save lives while still balancing the cost of needed resources. Rich Perse, founder and president of HeartSmart Inc., a company that provides CPR and AED training to organizations, including schools, points out that children are not the only people inside school buildings. He stated, "Schools are community centers… there are concerts, Christmas plays, basketball games. Schools are rented out to church groups on Sunday morning. They are not just in use by children during the school day" (Jones, 2011, p. 1). Schools are a community convening place which supports the assertion for cardiopulmonary resuscitation training to occur in these locations (Anderson & Lucia, 2009; Jones, 2011).

School Health Curriculum and Training

Schools can be the link to sudden cardiac arrest public awareness and better outcomes (Lotfi et al., 2007). Annual training in health related emergency response is important as a variety of school staff are asked to provide

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[2]Schools account for a relatively low incident public location of sudden cardiac arrest, accounting for 2.6% of all age groups public location SCAs, but the primary location for school-aged incidents.

emergency care to either adults or children each year (Hazinski et al., 2004).

Situations in which emergency medical services (EMS) must be notified occur in

approximately one third of all schools each year. Hazinski et al. (2004), found, "A

survey of school nurses in New Mexico documented that each year 67% of

schools activated the EMS system for a student and 37% of the schools

activated the EMS system for an adult" (p. 156). In their policy statement[3] to

schools, Hazinski et al. (2004) recommended educating students in sudden

cardiac arrest response for the documented benefits both on and off the school

campus. The policy statement is aligned to the position of Sudden Cardiac

Arrest Foundation (SCAF) (Anderson & Lucia, 2009, p. 16) on the strategy of

educating students in cardiopulmonary resuscitation due to its exponential effect

as documented by medical research; school-aged students are likely to teach

the skills to other family members. Anderson and Lucia (2009) reported, "As part

of a study in Denmark, researchers taught CPR to 35,000 seventh graders at

806 schools… A follow-up survey found that on average, each child taught CPR

to 2.5 family members and friends" (p. 16). In addition, the 2003 International

Committee on Resuscitation distributed a consensus document that endorsed,

"…instruction in CPR be incorporated as a standard part of the school

curriculum" (Cave et al, 2011, p. 1).   The following year, the American Heart

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[3]Endorsed by the American Heart Association, Emergency Cardiovascular Care
Committee, American Academy of Pediatrics, American College of Emergency
Physicians, American National Red Cross, National Association of School Nurses,
National Association of State EMS Directors, National Association of EMS
Physicians, National Association of Emergency Medical Technicians, the Program
for School Preparedness and Planning, National Center for Disaster Preparedness,
Columbia University Mailman School of Public Health, and reviewed by the Centers
for Disease Control Division of School and Adolescent Health.

Association (AHA) recommended that school preparation for response to medical emergencies include a plan to train all teachers and students in CPR and first aid (Cave et al, 2011, p. 1). Many states and school districts have also recognized the importance of training students in CPR and have begun adding awareness and skills training to the curriculum. The Colorado Academic Standards for Physical Education include education in CPR and AED use as part of the requirements for high school graduates to demonstrate post-secondary, workforce readiness (Figure 2).

Content Area: Comprehensive Health and Physical Education
Standard: 4. Prevention and Risk Management in Physical Education

Prepared Graduates:
➢ Apply personal safety knowledge and skills to prevent and treat intentional or unintentional injury

██

Grade Level Expectation: High School
Concepts and skills students master:
1. Demonstrate knowledge of safety and emergency response procedures

Evidence Outcomes	**21st Century Skills and Readiness Competencies**
Students can: a. Demonstrate knowledge in one or more of the following areas: Basic first aid, CPR, lifeguard training, water safety instruction, basic water safety, and automated external defibrillators (AEDs) (DOK 1-3) b. Describe emergency procedures for a physical education setting (DOK 1-3)	**Inquiry Questions:** 1. If you are not trained in first aid or CPR, how can you be of help in an emergency situation? 2. When did you want to help with a problem, but couldn't? 3. Why is it important to be trained in first aid, CPR, lifeguarding, water safety, and AEDs? **Relevance and Application:** 1. Individuals assist in efforts to help someone in case of an accident or emergency. 2. Individuals use technology to practice skills in emergency first aid or CPR. For example, they might take a CPR course at a community center. 3. Individuals can volunteer to work as lifeguards after they are properly trained. **Nature of Physical Education:** 1. Everybody can save a life if given the proper training. 2. Safety and emergency response procedures are not limited to emergency medical technician (EMT) professionals. 3. Understanding safety and emergency response procedures is important to the well-being of the community.

Figure 2: Colorado Academic Standards- Physical Education. *(*Colorado Department of Education, 2015)

Support for policies requiring CPR and AED training as a graduation

requirement would ensure students meet the standard, while also promoting

schools to collaborate closely with first responders to support this instruction

(Kann, Brener, & Allensworth, 2001). Regarding what "works" in health schools

and colleges, Marks (2010) recommended:

> Schools today may be the only venue where youth can learn those
> lifelong skills that are cross-cutting and essential in the adult workplace
> for ensuring economic security and high levels of mental, social, and
> physical well-being… learning approaches that accommodate all youth
> are especially indicated, as are adequate teacher training, resources and
> interactive departmental and community-based collaborations. (p. 426)

Cardiopulmonary resuscitation training in schools provides an educational

opportunity for students to learn from community-based partnerships, develop as

citizens, and for individual student growth (Kann et al., 2001; Reder & Quan;

2003). Reder and Quan (2003) specified, "At the individual level, CPR training

fits in the asset model for youth where skill acquisition produces other outcomes

such as increasing self-confidence and contributing to a sense of community" (p.

287).

Researchers for the SCAF concurred on the multi-faceted aspects of

learning cardiopulmonary resuscitation (Anderson & Lucia, 2009). Anderson and

Lucia (2009) recommended, "CPR training is a valuable addition to the students'

health curriculum. You're not just teaching squish and blow…the CPR course

includes a wellness component; it's a threshold to understanding other avenues

of health" (p. 15). Smith (2003) agreed on the far reaching impact for students

engaged in learning about public health problems. She explained:

> Education and public health are natural partners in learning. By focusing on real community health issues, students have the opportunity to develop critical thinking and problem solving skills which fosters their ability to make better decisions about their own health. (pp. v-vi)

The focus of schools as a venue to teach needed civic skills in partnership with community organizations as described here is also supported by mandates for school crisis plans to include collaboration with emergency medical services (CASB, 2011; Colorado Safe Schools Act, 2012; Kann et al., 2001).

The Common Good and Community Impact

Policy and practice to endorse cardiopulmonary resuscitation training in schools is aligned with an attention to the common good, that which supports the benefits and interests of all in society (Anderson & Lucia, 2009; Armstrong, 2006; Dewey 1916/2004; Kann et al., 2001; Smith, 2003). Public education, as a means to support the common good, is deeply embedded in the founding principles of this nation (Armstrong, 2006; Theobald, 2006). Stemming back to the earliest development of the American republic, the French Enlightenment philosopher Charles de Secondat Montesquieu, father to the American government model of separation of powers, wrote about the essentiality of education for optimal development of the republic (Theobald, 2006). Montesquieu (Theobald, 2006) noted that for this governmental form to be successful, "It must create among the population a continuous preference of the public interest over one's own…" (p. 320). School policies and practices that support the common good have provided benefits to society beyond that of the individual student (Theobald, 2006). The dissemination of policy to train school staff and students in CPR has far-reaching potential and consequently would

support this endeavor. As explained by Cave et al. (2011):

> Increasing the percentage of the population trained in CPR is an integral part of an overall strategy to improve community response to [SCA]. Schools provide excellent access to a large part of the community… Therefore, over time, a significant percentage of the overall community will receive training. (p. 3)

Dissemination of CPR policy to train school staff and high school students has the potential for cascading benefits far beyond reaching the targeted population of the policy (Anderson & Lucia, 2009; Cave et al., 2011).

Policy development, training, and educational practices requiring cardiopulmonary resuscitation training of staff and high school students also has a variety of benefits in implementation opportunities (Anderson & Lucia, 2009; Cave et al., 2011; Jones, 2011). Schools, advocacy groups, and businesses can view policy implementation as an occasion to create successful collaboration networks (Anderson & Lucia, 2009; Cave et al., 2011, Smith, 2003). Trainers from advocacy groups and medical services could volunteer time in the classrooms or at staff meetings (Anderson & Lucia, 2009). Organizations with missions to increase cardiac outcomes could provide schools with grants or other assistance, not only for training but also for equipment, books, or other resources (Anderson & Lucia, 2009; Cave et al., 2011). Cave et al. (2011) found, "An informal survey conducted by American Heart Association staff shows that schools that provide CPR training often rely heavily on external resources rather than on their own budgets to fund training" (pp. 7-8). Limited public school funding makes external support a necessity for implementation of such training (Anderson & Lucia, 2009; Cave et al., 2011).

As cardiopulmonary resuscitation education is consistent with many state academic health standards, schools could include training in their current health classes (Anderson & Lucia, 2009; Cave et al., 2011; Kann, Brener, & Allensworth, 2001). The new "hands-only" CPR awareness training advocated by the American Heart Association (2014b) can be learned in less than 30 minutes and publically accessible training materials do not require certified instructors. Using a trainer of trainers model, community health organizations and first-responders could train health teachers as CPR instructors, so teachers could easily implement the instruction into their classrooms (Anderson & Lucia, 2009). Joan Mellor, program manager for the Medtronic Foundation, the philanthropic arm of the Minneapolis-based Medtronic medical technology company, recommended taking a similar approach when considering start-up grant proposals. She stated:

> We give priority to school programs that educate students and staff about preventing sudden cardiac arrest and preparing them to act in an emergency. It's not enough to have ten teachers who know how to respond to a cardiac emergency. A student body that also knows what to do is an essential part of the safety-net (as cited in Anderson & Lucia, 2009, p. 16)

Training staff and students also has the potential to reach families of these trainees (Anderson & Lucia, 2009; Cave et al., 2011). Cave et al., (2011) explained, "Programs in which students can share materials used in school-based programs at home with family members can further increase the program's yield in terms of the total number of members of the community trained per unit of class time expended" (p. 1). The ability to reach a greater number of individuals for each person trained, and the ability to influence long-

term outcomes, supports training school staff and students in CPR through community impact initiatives and as a cost-benefit approach (Anderson & Lucia, 2009; Cave et al., 2011).

Cost-Benefit Analysis

Budgeting for training of staff and students is a critical issue for educational leaders (Marzano, Waters, & McNulty, 2005). Researchers for the Sudden Cardiac Foundation described many options that schools have discovered to support associated costs of CPR and AED deployment (Anderson & Lucia, 2009). These include, grants, donations, in-kind services, community benefit fundraisers, and more. Anderson and Lucia (2009) reported, "A recent survey of 118 high school principals in Washington state found that 60% of the AEDs in their schools were funded by donations, compared with just 27% funded by the school district and 11% by the school itself or its athletic department" (p. 15). Additionally, Anderson and Lucia (2009) suggested that schools and organizations implementing CPR training and SCA awareness should also plan for both the short-term and long-term budget needs of these policies with part of this planning including sustainability strategies such as working with local emergency medical service providers and training school faculty as trainers (p. 17).

As it pertains specifically to the increased cost for educating students in cardiopulmonary resuscitation, there is minimal additional expense in the context of students' educational preparedness. Comparing two sample formats of CPR training in schools, instructor delivered and self-directed, Cave et al. (2011, p. 7)

found that averaging the cost of training a student one time-over their 12 years of education against the average annual expenditure of educating a student at $10,414 per year accounted for only 0.0064% to 0.044% in the total cost of a student's education. The American Heart Association (2014b) provided this reminder:

> Schools are excellent places to offer CPR training, whether it's for graduation requirements, to help students with after-school or summer job requirements, or simply to improve cardiac survival rates in their community. When you teach kids CPR you're strengthening community safety -- and giving students skills they can carry into the future. (p. 1)

Both time and cost are finite resources, and the benefit of their use must be considered when developing policy to require cardiopulmonary resuscitation training of staff and students (Anderson & Lucia, 2009; Cave et al., 2011; Smith, 2003). However, these issues do not have to become roadblocks. Smith (2003) implored, "In this era where many school systems and social service agencies face increasing financial strain, it is imperative that schools and public health organizations collaborate to adequately meet the needs of their communities" (p. vi). Addressing implementation strategies for cardiac emergency response policy and practices should include a paradigm for collaborative impact strategies, including home-school participation and community-school collaboration (Anderson & Lucia, 2009; Cave et al., 2011; Smith, 2003).

School Health Policy and Crisis Planning

Despite many schools addressing cardiac emergencies by training staff and students in CPR and by installing AEDs, the decision to adopt these policies and practices is not made without some reservation (Jones, 2011). As reported

by Jones (2011), "DPS [Denver Public School] officials had been pondering the

installation of the device… for at least the past five years. It wasn't a quick and

easy decision, it's an additional duty… it's the training and monitoring required"

(p. 1). Jones (2011) also described the difficulty of getting support behind

implementation for such policies. She writes, "Many people simply don't view

[SCA] as a common enough occurrence among children to make placing AEDs

in schools a top priority, given all the other budget demands confronting

educators" (Jones, 2011, p. 1).

Unfortunately, in many school districts, it is not until a tragic event occurs

that attention to specific crisis policies and practices becomes a priority (Aspen

Superintendent of Schools, 2012, July 12; Landau, 2011). Initially, there may be

a lack of urgency for schools to focus on policy and practice regarding cardiac

emergencies, in some ways understandably, as the common public view is that

heart problems affect only the elderly and the sick (Anderson & Lucia, 2009;

AHA, 2011; AHA, 2014b; Aspen Superintendent of Schools, 2012, July 12;

Landau, 2011, SCAA, 2011; SCAF, 2014). That was the case in Aspen,

Colorado. The Aspen Superintendent of Schools (July 12, 2012) explained:

> A year ago this summer when had a basketball camp here… We had a young man who had a history of a heart condition unbeknownst to us, a young man who was exercising quite aggressively at the basketball camp at an altitude of 8,000 feet, all the makings of a disaster. Unfortunately, a tragic accident did occur and the young man passed. He had to be attempted to be resuscitated here in our school and subsequently did not make it. At that juncture, I recognized that we do a lot with children in environments where there are not always a number of trained professionals handy to address a medical-crisis situation. (p. 1)

While increased accessibility to automated external defibrillators has been a

significant development in the Aspen schools, the superintendent made it clear that the number-one focus for ensuring the safety of students and staff at schools in regards to cardiac emergencies is a focus on staff development (Aspen Superintendent of Schools, 2012, July 12).

In the Aspen School District, policies and practices that support on-going training in CPR and AED deployment for staff, including teachers, administrators, office staff, janitorial staff, and volunteer coaches are mandatory (Aspen Superintendent of Schools, 2012, July 12). The Aspen School District is progressive in requiring through district policy that all staff be current in first-aide and CPR training (Policy GBGAB). Bosher et al. (2004), further explained the importance of this type of intentional planning around all crisis policy. They stated, "Planning, preparation, and practice are the three major components of crisis management. Preparation includes the identification and acquisition, if necessary, of resources, both human and material, that will be essential in dealing with the emergency" (Bosher et al., 2004, pp. 13-14). Hence, developing policy and practices that address cardiac emergencies as part of preparedness planning is advisable (Hazinski et al., 2004). The American Heart Association has identified several reasons for schools to adopt crisis planning policies and practices focused on sudden cardiac emergencies:

- Most [SCAs] occur outside of the hospital. Nearly 90% of these cases will result in death largely because CPR and AEDs were not used.
- With only a 30-minute hands on training students can learn the skills necessary to save a life in an emergency situation.

- School districts would have a lot flexibility to implement this change. The CPR training can fit comfortably into existing classes like PE, Health, or Science and it could be put anywhere between 7-12 grades. (Churnin, 2013, p. 1)

The reasons provided for schools to adopt safety plans addressing sudden cardiac arrest are compelling due to the life-saving possibilities (Anderson & Lucia, 2009; Cave et al, 2011; Connolly et al., 2007; Drezner et al, 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014).

School safety requires comprehensive crisis planning to ensure an efficient and structured response to SCA (Anderson & Lucia, 2009; Bosher et al., 2004; Cave et al., 2011; CASB, 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014; Smith, 2003). Drezner et al. (2007) specified that essential elements in a comprehensive plan include instituting an effective communication system, training anticipated responders in CPR, accessibility to an AED for early defibrillation, acquiring necessary emergency equipment, coordinating and integrating on-site responder programs with the local EMS system, and practicing and reviewing of the response plan (p. 143). School leaders must see planning for such emergencies and the role in supporting increased societal outcomes as part of their duties as public servants (Anderson & Lucia, 2009; Bosher et al., 2004; CASB, 2001; Connolly et al., 2007; Smith, 2003) . These policies and practices should not be put on hold until a tragedy occurs nor should districts with potential for increased risk ignore such implications (Anderson & Lucia, 2009; Aspen Superintendent of Schools, 2012, July 12; Connolly et al., 2007).

Health Discrepancies and Social Justice

Risk for medical and health related emergencies are not equal across all populations in the United States. In the Center for Disease Control 2011 report on health disparities, director Thomas Frieden (2011) explained, "Health disparities are differences in health outcomes between groups that reflect social inequalities… ongoing racial/ethnic, economic, and other social disparities in health are both unacceptable and correctable" (p. 1). Likewise, there are discrepancies in the occurrence and survival rates from sudden cardiac arrest (MedicineNet, 2013; Sasson et al., 2013). While SCA occurs frequently across all ages, race, abilities, and gender, survival rates drop significantly for victims of color and for victims in impoverished areas. Frieden (2011) describes these health discrepancies by race and poverty as separate segments of the population but these population segments may also be correlated. As reported on MedicineNet, "Research shows that neighborhoods that are predominately black or Hispanic have higher rates of SCA but lower rates of CPR compared to predominately white neighborhoods. Bystander CPR rates also are lower in poorer neighborhoods, regardless of race" (2013, p. 1). Medical research (Sasson et al., 2013) conducted on behalf of the American Heart Association has supported this claim of disparity. Sasson et al. (2003) described this discrepancy, "Residents of neighborhoods that are primarily Latino, Black, poor, or non–English speaking are less likely to receive bystander CPR and are consequently less likely to survive" (p. 1344). The combination of increased rates of occurrence, decreased rates of bystander response, and subsequent decreased

survival rates supports training school staff and students specifically from

impoverished neighborhoods in cardiopulmonary resuscitation (MedicineNet,

2013). Dr. Comilla Sasson, an assistant professor in the emergency medicine

department at the University of Colorado Anschutz Medical Campus expounded,

"We have always had a one-size-fits-all approach, blanketing a whole area with

CPR training. We are now saying that we need to shift our thinking to target CPR

training to the areas where it is most needed" (MedicineNet, 2013, p. 1).

Despite these figures and recommendations, there appears to be little, if

any, educational research on school policy, leadership, or practice for addressing

this equity issue (Reder & Quan, 2003). Of greater concern is that schools'

pressure to address only an academic achievement discourse (Armstrong, 2006)

focus may increase the likelihood that schools located in high minority,

impoverished neighborhoods would be less likely to support enrichment learning

(Kohn, 2000). Alfie Kohn (2000) warned:

> Thoughtful discussions about current events are especially likely to be
> discarded because what's in today's paper won't be on the exam.
> Furthermore, it is far more difficult for teachers to attend to children's
> social and moral development…when the only thing that matters is scores
> on tests. (p. 20)

Unfortunately, it is commonly through enrichment learning opportunities that

public health issues such as CPR training in the classroom are addressed

(Churnin, 2013; Kohn, 2000).

The compounded effect of increased occurrence, lack of bystander

response, and likelihood of less health training and education in poor

communities only increases the discrepancy in health issues and equity of care

(Sasson et al., 2013). School leaders that believe in the ability of education to cultivate democracy cannot allow such inequities to persist and should address polices and practices in their schools to mediate these types of health inequities (Anderson & Lucia, 2009; Sasson et al., 2013).

School Initiative Exemplars

Notwithstanding the generally unsatisfactory outcomes for SCA, several communities have substantially increased education for bystander response through training in schools. This practice is known to increase survival rates following recommendations from medical research to implement comprehensive plans within the schools (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2012). Exemplars for establishing school-community crisis partnerships to address SCA are communities in Seattle, Washington; Atlanta, Georgia; and Aspen, Colorado. Washington's King County schools have long supported CPR education and training as part of the community initiative for increasing sudden cardiac arrest survival rates. Reder and Quan (2003) noted, "In 1999, Washington state EMS made it an objective to develop successful approaches to increase the number of Washington State high school students who receive CPR training prior to graduation" (p. 284). Likewise, just outside of Atlanta, Georgia:

> All of the Fayette County Public Schools' nurses and their back-ups undergo CPR/AED training, along with one faculty person per grade and all physical education and health teachers. Coaches attend a first aid program, which includes CPR/AED use; the 250 bus drivers and 250 after-school staffers take a CPR course as well. As teacher's assistants are hired, they, too, complete CPR training, as do all ninth-graders through their health class. (Anderson & Lucia, 2009, p. 14)

These are but two replicable illustrations of cardiac emergency training in schools.

In addition, in Aspen, Colorado, the school district works directly with the Aspen Ambulance District to provide training to all staff and to high school seniors before graduation (City of Aspen & Pitkin County, 2012). School initiatives to establish cardiopulmonary resuscitation training in schools are not infrequent (Rice, 2013). Rice (2013) documented, "Thirty-six states require CPR for graduation, of the fourteen which do not, ten are working to make it a requirement with legislation currently pending" (p. 1). Currently, Colorado is not one of the thirty-six states necessitating CPR as a graduation requirement, nor is it one of the ten working on current legislation to require CPR as a graduation requirement. Recently, in May 2014 the Colorado governor did sign into law requirements for school coaches to be trained in CPR and for $250,000 from the general fund to be allocated for grants to support schools to provide CPR training to students (Colorado Revised Statutes HB14-1276). Furthermore, among the states requiring CPR training there is little consistency in the requirements (Stengle, 2011). For example, "…of the thirty-six states that have set some standard for teaching CPR in schools, only six explicitly mention CPR training courses that routinely include hands on skills practice" (American Heart Association, 2011, p. 1). An addition, implementation outcomes for these required initiatives are unknown (Reder & Quan, 2003).

Leadership and Organizational Implications

Non-profit and professional organizations across the nation, including the

American Heart Association, the American Academy of Pediatrics, and the

American College of Emergency Physicians, have called for laws to address

sudden cardiac arrest in schools (Stengle, 2011). Stengle (2011) documented,

"At least 36 states either require or encourage CPR training in schools, according

to the heart group. However, that ranges from suggesting that students recognize

the steps of CPR to requiring certification" (p. 1). Additionally, there are a variety

of governmental organizations, including the Environmental Protection Agency,

Occupational Safety and Health Agency, Communicable Disease Center, and

Federal Emergency Management Agency, that may respond to a medical crisis

and are pertinent stakeholders for this public health issue. These specific-

purpose departments also assist the work of federal, state, and local law

enforcement agencies that collaborate with local school districts on crisis and

emergency policy and practice (Bosher et al., 2004). Sudden cardiac arrest is a

serious public health issue affecting all of society, hence, stakeholders range

from the individual student, staff member, and parent to local emergency

response teams and nonprofit advocacy groups and large federal entities and

national professional organizations (Marshall & Gerstl-Pepin, 2005).

Educational Leadership Influence

With the expansive range of stakeholders impacted by cardiac

emergencies, understanding the influential factors on school practice and policy

to implement recommendations for SCA awareness at the school level and

beyond is vital (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Reder & Quan, 2003; SCAF, 2012). Marzano, Waters, and McNulty (2005) explained that leadership is commonly considered to be one of the most significant factors of influence for focused practices within schools. In particular, building-level leadership influences a variety of aspects of schooling (Marzano, Waters, & McNulty, 2005). Marzano et al. (2005) documented research that building-level leadership impacts many aspects of a school, including student learning opportunities, teacher attitudes, faculty practice, choice of curriculum, and focus for instruction (p. 5). All of theses factors are important for initiating and implementing SCA initiatives in the schools, in particular the regular practice of training of staff and students (Anderson & Lucia, 2009). Support for training of staff and students in CPR and AED skills is connected to both staff development focus and school curricular choices (Anderson & Lucia, 2009; Cave et al., 2011). These two aspects of education in schools are highly reliant on the influence of leaders at both the school and district level (Marzano et al., 2005).

School leaders should be aware of their role as both change agents (Marzano et al., 2005) and as systems leaders (Fullan, 2008). In the capacity of change agent, school leaders have the ability to define needed change and create focused initiatives, as well implementing structures and practices to support shared commitments (Marzano et al., 2005). As systems leaders, principals are aware of the bigger picture that schools can influence (Fullan, 2008). Fullan (2008) explained that school leaders as systems leaders do not

need to think of themselves as pushing the agenda of another, the government or special-interest groups, but as having influence to push common priorities and to collaborative work with these agencies to achieve common priorities. Both of theses roles of the building leader allow the principal to be uniquely situated to both promote and ensure SCA awareness, CPR training, and AED accessibility in the educational setting. School leaders' values and attention often become the focus of the school faculty; school faculty focus directly impacts the educational opportunities of students (Marzano et al., 2005). Schools with leaders that have a focus on the development of the whole child, beyond standard academic achievement, are more likely to embrace educational practices designed to develop the child as an active citizen or address identified societal issues (Armstrong, 2006; Kohn, 2008). As the school leader's focus is known to spill over to staff and students (Deal & Peterson, 1999; Marzano et al., 2005), the role of the school leader is critical in implementing collaborative impact strategies in schools to address public health issues, such as those presented by SCA.

Possible Barriers

Policy to support sudden cardiac arrest outcomes, such as requiring cardiopulmonary resuscitation training for school staff and high schools students, should include recommendations by pertinent advocacy groups (Cave et al., 2011). The America Heart Association endorsed implementation of policy with the most affective target audience, which includes both secondary students and school staff as well as critical teaching points, which includes recognition of the emergency, effective chest compressions, and skills practice (Cave et al., 2011).

However, school leaders may face potential obstacles when implementing these recommendations (Anderson & Lucia, 2009; Cave et al., 2011). Cave et al. (2011), cautioned, "The challenges of implementing CPR or AED training in schools go beyond choosing specific program content… the 'most significant' [cited] barrier to providing training were time to teach CPR in the curriculum, lack of funds, and instructor scheduling difficulties" (p. 7). Because of the current debate regarding the purpose of schools (Armstrong, 2006), the teaching of only academic skills versus developing a citizenry and facilitating student-community involvement, school leaders must be sensitive to this public discourse in their communication with stakeholders on the topic of CPR policy and practices in schools (Anderson & Lucia, 2009; Cave et al., 2011). When agreements can be reached that schools serve a function for the welfare of students and citizens, then addressing public health issues such as SCA becomes more relevant, increasing support for adoption of policy and practices (Anderson & Lucia, 2009; Armstrong, 2006; Smith, 2003).

Dr. Laws (personal communication, Dec. 12, 2012), lead cardiologist at Valley View Hospital in Glenwood Springs, recommended following successful public relations health initiatives such as the concussion awareness campaign to gain support for the sudden cardiac arrest issue. Helping school boards to understand the connection to the responsibility for safety of staff and students in their schools and policy related to SCA is an essential component of a public relations campaign (Anderson & Lucia, 2009). Anderson and Lucia (2009) explained, "One of a school board's main responsibilities is to implement

essential safety measures...SCA preparedness should have the same high priority" (p. 14). The researchers (Anderson & Lucia, 2009) described one school district in Minnesota that made a successful campaign to the school board supported by statistical data of SCA, outlining the recommended chain of survival and laying out a district plan for implementing and sustaining these recommendations. Communicating public awareness of the need, aligning school purpose with policy and practice, and addressing concerns regarding availability of limited resources are methods to overcome barriers for support of new policy adoption and implementation for cardiopulmonary resuscitation training in schools (Anderson & Lucia, 2009; Cave et al., 2011).

Conclusion

Sudden cardiac arrest is a medical emergency that takes the lives of more Americans than any other condition (SCAA, 2011). Like many other health issues, minority and impoverished populations have significantly decreased survival rates from SCA (Frieden, 2011; Masoudi et al, 2013; MedicineNet, 2013; Sasson et al., 2013). Fortunately, the medical community has establish a body of research (Anderson & Lucia, 2009; Cave et al, 2011; Drezner etal, 2007; Estes, 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF 2012) that identifies the needed chain of events to support increased outcomes that includes calling EMS, initiating bystander response, immediately starting CPR, and employing an AED. Medical researchers (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Reder & Quan, 2003; SCAF, 2012) have also recommended that schools

are the best place to train citizens in the correct response and skills of CPR.

Further, medical research (Anderson & Lucia, 2009; Cave et al, 2011; Connolly et

al., 2007; Drezner et al., 2007; Estes, 2007; Hazinski et al., 2004; Lotfi et al.,

2007; SCAF, 2012) has demonstrated that immediate outcomes of increasing

citizens' knowledge and skills to perform CPR in the event of sudden cardiac

arrest can create long-term outcomes of increased survival rates. Still at issue is

the lack of educational research pertaining to medical research

recommendations for addressing SCA in schools including implementation,

quality, or capacity issues regarding school policy and practices (Reder & Quan,

2003). In addition, through the lens of an educational leader's obligation to

support equity through educational policy and practice, the lack of

documentation regarding possible discrepancies in training of staff or students

from minority and impoverished schools as compared to schools of affluence

has leadership implications. While all schools are in need of supporting better

outcomes for public health needs such as SCA (Hazinski et al., 2004; Smith,

2003), future research that reveals possible discrepancies in education for

important health issues in impoverished and high minority schools may promote

legislative mandates for policy requiring CPR training in schools.

Schools can potentially play a significant factor in implementing practices

based on these policies that shift the outcomes of SCA (Anderson & Lucia, 2009;

Bosher et al., 2004; Cave et al., 2011; CASB, 2011; Connolly et al., 2007;

Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014; Smith,

2003). While medical research (Anderson & Lucia, 2009; Cave et al, 2011;

Connolly et al., 2007; Drezner et al, 2007; Hazinski et al., 2004; Lotfi et al., 2007;

SCAF, 2012) has exhaustively documented that immediate response directly

impacts survival rates in sudden cardiac arrest and that schools could be the

best catalyst for creating change by bystanders, there has been little to no

educational research addressing health policy or practices in regards to cardiac

emergencies in schools (Reder & Quan, 2003). The research from in this

dissertation is designed to fill this gap in the knowledge base regarding the

characteristics of schools and the policies and practices regarding

cardiopulmonary resuscitation training in schools.

CHAPTER III

METHODOLOGY

Understanding the impact of school practice and policies for addressing cardiac emergencies could save some of the thousands of lives lost to sudden cardiac arrest (SCA) each year (Anderson & Lucia, 2009; Cave et al., 2011; Connolly, Toner, Connolly & McCluskey, 2007; Deal & Peterson, 1999; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Marzano, Waters, & McNulty, 2005; Reder & Quan, 2003; SCAF, 2012). In particular, new educational research identifying inequities in school practices in regards to cardiac emergency response and training in impoverished, minority schools may indicate a need for legislative action to require change (Frieden, 2011; MedicineNet, 2013; Sasson et al., 2013). Additionally, identifying the characteristics of schools that train and educate staff and students in cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) use could provide needed understanding about program models or school leadership qualities that best address public health issues, such as SCA, in schools.

An Agenda for Research

Sudden cardiac arrest is the leading cause of death for Americans (Sudden Cardiac Arrest Association [SCAA], 2011) and research supports the notion that schools, with supportive educational leaders, can act as change agents to reverse this trend (Anderson & Lucia, 2009; Cave et al., 2011; Connolly

 et al., 2007; Deal & Peterson, 1999; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Marzano et al., 2005; Reder & Quan, 2003; SCAF, 2012). Hence, school leaders should better understand the problems of implementing coordinated response efforts for this public health issue with school policies and practices as the catalyst. From their medical research, Reder and Quan (2003) recommended further studies pertaining to cardiopulmonary resuscitation training outside of the medical field. "Evaluation of efficacy of training in the high school setting will require nonclinical outcome measures that are easy and inexpensive to obtain" (p. 287). When school leaders embark on educational research to better understand a problem, it is important that they review the paradigm from which the research will be conducted and the methodologies that will best support the research to answer the problem in question (Crotty, 2011). Specific to the research in this dissertation, the design addressed the identified problem statement: As the major educational institution of the country, K-12 schools, which collectively serve a vast majority of the population, have an obligation to address avoidable tragedies and death of citizens and children from SCA.

Research Questions

The aim of the methodology outlined for the educational research in this dissertation was to provide answers to the following research questions:

Q1   Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2   Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

Research Design

The research questions include descriptions of the characteristics of a population, schools offering CPR education to staff or students and schools with on-site AEDs. The appropriate design for this type of study is survey design (Briggs et al., 2012; Buckingham & Saunders, 2004; Creswell, 2008; Munner & Drever, 2009). Creswell (2008) explained, "Survey research designs are procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population" (p. 388). As Crotty (2011) indicated, research designs must address four components to justify the design: epistemology, theoretical perspective, methodology, and methods. The following is a framework of these elements for this dissertation as it addressed the identified problem statement.

Epistemology- Objectivism

The epistemology of a research study is an explanation of the understanding of what is known (Crotty, 2011). The epistemology of this research is objectivism. Understanding reality from an objectivist framework assumes that there is truth that exists outside, or objective, from experience. In regards to what is real, objectivism:

> …suggests that the world exists independently of our lives and socio-cultural practices, including the practice of research: the world is "real" and it exists around us "out there" indifferent to our hopes, beliefs and desires at any particular moment. The nature of the world out there is something about which we can make discoveries through research, and our knowledge increase with every discovery. (Briggs et al., 2012, pp. 107-108)

Research on the characteristics of leadership or other descriptors of schools is factual data that provides a better understanding of the connections between objective variables in the educational setting (Briggs et al., 2012). This factual data is not dependent on any experience with these variables nor is the understanding of any relationship of these facts if there are any (Briggs et al., 2012). This is not to say that the implications of these facts and possible relationships are not experienced and hence interpreted by the participants from a variety of perspectives (Briggs et al., 2012). However, the objectivist foundation for this research is that these factors as objects for understanding can increase knowledge of the topic regardless of constructed responses (Briggs et al., 2012).

Objectivism is part of the philosophy of realism. Philosophically, realism acknowledges the world exists outside of human experience and human consciousness (Crotty, 2011). Corresponding to the ontological foundation of objectivism is the epistemology of this research study, positivism. Understanding the world through a positivist lens is embedded in empirical practices. Empirical studies identify factual or observable information as existing that can be used to gain more knowledge about the world to increase understanding (Crotty, 2011).

Methodology- Survey Design

Categorizing the characteristics of an organization and its practices can help identify possible underlying outcomes (Rossi, Lipsey, & Freeman, 2004). Understanding factors such as perceptions, philosophy, program models, demographics, policy, and practice can provide insight into otherwise unnoticed

influential factors at play in an organization (Briggs et al., 2012). The primary intent of this research study was to understand the variables of schools and their practices of providing CPR education to staff and students along with AED availability. Survey research design is an appropriate methodology for identifying trends in this data (Creswell, 2008). Regarding applicable designs for the methodology, Creswell (2008) recommended the use of research survey, "to describe trends" (p. 356). For this dissertation, the survey design supported identification of the characteristics of the school (primary, middle, secondary, public, public charter, public alternative, or independent/private; ethnicity, minority group, poverty indicator) and the school leadership educational philosophy (academic achievement focus or whole-child focus) with the training of staff or students in cardiopulmonary resuscitation and use of automated external defibrillators.

There are two primary survey research designs, cross-sectional and longitudinal (Creswell, 2008). This research study was a cross-sectional type as it was designed to collect data about current practice (Creswell, 2008). This survey type has the benefit of collecting data in a short amount of time while also documenting current practice (Creswell, 2008). There are also sub-types of cross-sectional survey research that include identifying attitudes and practices, community needs, or program evaluation (Creswell, 2008). For this dissertation, information was collected regarding both practices in schools and beliefs of school leaders, hence the study was a cross-sectional survey of attitudes and practice and is applicable to the research questions, Of respondents, what are

the characteristics of schools that provide CPR training? and Of respondents, what are the characteristics of schools that have an on-site AED?

The survey data about practices and beliefs of school leaders may demonstrate some relationship between these variables. As Creswell (2008) explained, "Survey research has much in common with correlational designs" (p. 388). However, the correlation of these variables in survey research is primarily intended to further understand and describe the population as opposed to a correlational research design intended to relate the variables or predict outcomes (Creswell, 2008). In addition to the criteria for choosing survey research as an appropriate methodology for the study, survey research designs also have specific characteristics. Examples of these elements are sampling from a population, collecting data through questionnaires, designing an instrument for data collection and obtaining a high response rate (Creswell, 2008). Further characteristics for this dissertation were addressed in the research design plan for data analysis.

Theoretical Perspective-
Positivism

The theoretical perspective of a research study consists of philosophical assumptions about the world (Briggs et al., 2012). Creswell (2008) stated that the theoretical perspective informs the methodology by, "… providing context for the process and grounding its logic and criteria" (p. 3). Researchers should be clear about what philosophy they espouse and its impact on their research (Briggs et al., 2012; Creswell, 2008). For this dissertation, the context for the research and its logic is a positivist theoretical perspective. According to Briggs

et al. (2012), a positivist perspective accepts, "…that facts can be collected about the world; language lets us represent those facts unproblematically; and it is possible to develop correct methods for understanding educational process, relations and institutions" (p. 16). The survey research design used quantifiable data to describe and draw conclusions about the reality of educational policy and practice in schools related to cardiopulmonary resuscitation training. The design looked at facts independent of participant experience. The design reviewed only at human values, school leaders' belief about educational purpose, as one of the characteristics to be studied. Briggs et al. (2012) described the process of evaluating participant beliefs from a positivist perspective, "Human characteristics and attributes can be considered as variables…Discoveries about the relationship between variables should enable the positivists to explain the work they have uncovered" (p. 18).

The research questions for the study were approached from a critical stance, a concern that there could exist injustice for varied groups (Crotty, 2011). Specifically, the survey research may reveal a need for educational legislative policy to remedy discrepancies in access to educational information and practices for specified demographics in the study, dependent on identified trends in the analyzed data. However, from a positivist perspective, implications of the normative position or major findings can be identified but cannot provide for verification or falsification of the position (Briggs et al., 2012). Hence, while this survey research was intended to help identify and describe associations between access to practices, CPR training and on-site AEDs, related to sudden cardiac

arrest response in schools and school characteristics, if such relationships appear to exist, the data are only empirical evidence that describes a need for further possible studies embedded in a critical stance; this dissertation did not intend to identify causality between these trends (Creswell, 2008; Crotty, 2011).

Method- Survey Using Questionnaire and
Descriptive Statistical Analysis

Methods identify the procedures and techniques used to gather and analyze data to answer a research question (Creswell, 2012). The research methods for this survey design used a questionnaire to collect data and descriptive statistical analysis of the collected data. Defined online from the Research Methods Knowledge Base (Trochim, 2006), survey research is a broad area that includes measurements and techniques to ask questions of participants. For this dissertation, responses were collected using an online questionnaire developed in Qualtrics (Version 2015) and explained further in the data collection design. To provide answers to the research questions, collected data were also analyzed using the Qualtrics (2015) online software to classify responses from the questionnaire. Frequency distribution tables along with graphs, referred to as histograms, were used to simplify the description of the data by using a depiction of the responses across categories of school characteristics (type, demographic, school leader philosophy) and, for each single variable, CPR training for teachers, CPR training for students, an on-site AED, and AED training (Trochim, 2006). Further analysis of the data described these trends in characteristics of these responses. The findings support

recommendations for educational practice, research, or policy to address the research problem.

Participants- School Leaders

School leaders (principals, directors, headmasters, etc.) were participants for this study. The school administrators were identified through the Colorado Department of Education, Colorado League of Charter Schools, and Colorado Independent/Private school listings. School leader contact information was obtained through these lists from an online contact service. School leaders were invited to participate in the study through email correspondence and were provided the University of Northern Colorado (UNC) Institutional Review Board's (IRB) authorization for the study (Appendix B). This research was an exempt study as no vulnerable populations were included; only adults were survey participants. IRB approval from UNC was given on January 16, 2015.

Setting- Colorado Schools

The setting for this dissertation was schools across Colorado, including all primary, middle, secondary, public, public charter, public alternative, or independent/private schools. The objective was to obtain participation by a majority of schools in Colorado. Colorado does not currently have legislated mandates regarding training of staff and students in cardiopulmonary resuscitation, automated external defibrillator placement in schools, or for sudden cardiac arrest emergency awareness (Stengle, 2011). However, the Colorado Academic Standards (2013) do include these skills as expected learning outcomes for Colorado students. The lack of a legislative mandates in Colorado

will support the premise that any notable trends between school type, school demographics, or school leader philosophy and training of staff or students in CPR is not a consequence of legal requirements but of local control decisions within that school or school district. Hence, the research data were reviewed for a need of legislative mandates regarding inequities that presented in data trends. In addition, the inclusion of CPR skills and AED use in Colorado State Standards (2013) suggests a general educational agreement that these skills are important for students to know and be able to demonstrate, and hence, are established as relevant to the educational setting.

Data Collection- Electronic Questionnaire

The research data collection tool for this research study was electronic questionnaire (Creswell, 2008). The electronic questionnaire was designed using Qualtrics (2015) software and then emailed to participants (Appendix C). Included in the questionnaire, was a copy of the consent form for participation (Appendix D) and the definitions for key terms use in the survey. The response format was structured questions with single-forced response (Trochim, 2006). To ensure the population was able to complete the survey and that the instrument was designed to adequately measure the research questions, pilot testing the questions occurred twice (Briggs et al., 2012; Creswell, 2008), initially on development of the final survey questions with support of a University of Northern Colorado research consulting lab intern and then again using a draft questionnaire given to a small group of individuals outside the target population in order to make any necessary changes to the questionnaire based on feedback.

Establishing a strong response rate is an important consideration in survey data collection (Creswell, 2008; Groves, 2006; Stoop, 2005). Many research methods textbooks generally recommend that adequate survey response rates should be between 50%-70% (Babbie, 1990; Bailey, 1987; Nulty, 2008; Schutt, 1999). However, response rates are of particular concern with the use of online questionnaires, as rates are often low compared to other survey collection methods, on average less than 30% (Hager, Wilson, Pollak, & Rooney, 2003; Nulty, 2008; Stoop, 2005). In addition, in surveys designed to collect organizational information, as opposed to personal information, response rates are known to be the lowest; in these cases rates starting as low as 15% have been considered acceptable (Hager et al., 2003). This survey research collected data on organizational practice, using an online questionnaire, both factors known to lower responses rate (Hager et al., 2003).

While the recommended response rate of 50% was the target response rate for this research study (Babbie, 1990; Bailey, 1987; Schutt, 1999), data collection procedures that are known to increase response rates was the focus for the data collection methods (Briggs et al., 2012; Creswell, 2008; Hager et al., 2003). The data collection was conducted during the school year and the collection period was six weeks in duration using the three-phase survey administration procedure as described by Creswell (2008, p. 403):

- Step 1: First email of electronic questionnaire- 2 weeks
- Step 2: Second email of electronic questionnaire- 2 weeks
- Step 3: Electronic questionnaire completion reminder email- 2 weeks

Both creating interest for the relevancy of the topic studies and the three-phase procedure supports increased return response rate (Creswell, 2008). "Thank you" messages and a link to more information on sudden cardiac arrest were provided for all completed questionnaires.

As indicated, the survey study population was Colorado school leaders. The survey was a census study as an attempt was be made to include the entire population of Colorado school leaders (Creswell, 2008). The population of school leaders, which includes but is not limited to principals, directors, and heads of schools in Colorado, is relatively small and easily identified, so the study population equals the sample (Creswell, 2008). To the extent it was possible to obtain contact information, all of the population was the target population and included in the survey design to allow for the most comprehensive description of the surveyed group (Creswell, 2008). As the study does not intend to generalize findings to a larger population but only to describe the responses of the surveyed respondents, the sample size did impact validity of the study.

Contact information to send surveys to school leaders was obtained from school listings on websites accessed through an online service. To increase response rate and gain the participant's interest, an email message was sent to identified school leaders that includes a message explaining the nature of the study and my personal interest in the research along with the link to the electronic questionnaire. The Institutional Review Board (IRB) approval was included with the online survey along with an electronic signature for participation in the study; completing the survey conveyed consent to participate. The email

message indicated that the data collection was confidential. Non-respondents to the questionnaire were also part of the survey design and addressed in data analysis.

Data collection list of key terms. The following terms pertain to the research study as defined in the survey design's electronic questionnaire:

Ethnicity. Refers to shared cultural practices, perspectives, and distinctions that set apart one group of people from another. That is, ethnicity is a shared cultural heritage. The most common characteristics distinguishing various ethnic groups are ancestry, a sense of history, language, religion, and forms of dress. Ethnic differences are not inherited; they are learned (Cliff Notes, 2014).

Free-reduced lunch qualified. An application for the free and reduced lunch program or the family economic survey that qualifies students based on economic criterion at or below the federal poverty level. Free and reduced qualification can be used as an indicator of poverty incidence (Poverty Reduction & Equity, 2014).

Latino. A person of Latin-American (Mexico, Central American, Caribbean or South American) origin living in the United States (Encyclopedia Britannica, 2014a).

Middle schools. Schools primarily serving grade levels 6-8.

Minority group. A culturally, ethnically or racially distinct group that coexists with but is
subordinate to a more dominant group. As the term is used in the social sciences, a subordinate position is the chief defining characteristic of a minority

group. As such, minority status does not necessarily correlate to population. In some case one or more so-called minority groups may have population many times the size of the dominate group (Encyclopedia Britannica, 2014b).

Non-Latino. A person *not* of Latin-American origin living in the United States.

Non-minority group. A culturally, ethnically or racially dominant group.

Non-public school. Applies to private, parochial and independent schools which provide education to children of compulsory school age. Neither the State Board of Education nor any local board of education has jurisdiction over the internal affairs of any non-state independent or parochial school in Colorado. A non-public school is considered a private business (CDE, 2014c).

Poverty indicator. A measure to translate the comparison of well being with the poverty line, indicator may be a measure for individuals, households, aggregate group or sub-groups. Poverty indictors may measure incidences, depth, severity (Poverty Reduction & Equity, 2014).

Primary schools. Schools primarily serving grade levels K-5.

Public school- alternative campus. Colorado public school definition and serves one of the following student populations:

- All students have severe limitations that preclude appropriate administration of state assessments
- All students attend only on a part-time basis and come from other public schools where the part-time students are counted in the enrollment of the other public school; or
- More than 95% of students have either an Individualized Education Program (IEP) and/or meet the definition of a "high risk" student (CDE, 2014a).

Public school- charter*.* Colorado public school definition and operates

via a contract with an authorizer such as the local school district or, in some

cases, the Colorado Charter School Institute (CDE, 2014b).

Public school- traditional. A Colorado public school is an institution that

receives the majority of its funding from moneys raised by a general state,

county, or district tax and whose property is operated by a political subdivision of

the state and:

- Is an autonomous entity of a preschool through grade 12 district, the Charter School Institute or Board of Cooperative Educational Services (BOCES) which includes preschool through grade 12 grades within.
- Has its own principal who is not under the supervision of a principal of another public school,
- Has a budget separate from any other public school,
- Provides a complete instructional program that allows students to proceed to next grade level or in a high school to graduate students (CDE, 2014d).

Regional descriptions*.* Characteristics of an geographical development

area.

Rural region*.* A rural area is an open swath of land that has few homes or

other buildings, and not very many people. A rural areas population density is

very low. In a rural area, there are fewer people, and their homes and businesses

are located far away from one another (National Geographic, 2014a).

Rural-resort region. An area which encompasses all the activities which

may be carried out in a rural environment and which attract visitors because of

their traditional features and because they are different from their usual lifestyle.

Visitors may interact various activities, such as horseback riding, sightseeing,

fishing, hunting, mountaineering, agritourism, cultural tourism, wine tourism/travel, health tourism, skiing etc. Accommodation is provided in establishments which have been especially prepared to accommodate visitors (Ecotourism in America, 2014).

School characteristics. School descriptors including school designation, grade levels served and regional description.

School demographics. School descriptors of population characteristics.

Secondary schools. Schools primarily serving grade levels 9-12.

Socioeconomic status. A measure of an individual's or family's economic position based on income (Chicago Health77, 2014).

Suburban region. Suburban areas are smaller urban areas that surround cities. Most suburbs are less densely populated than cities. They serve as the residential area for much of the city's work force. The suburbs are made up of mostly single-family homes, stores, and services (National Geographic, 2014b).

Urban region. A region surrounding a city. Most inhabitants of urban areas have nonagricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways (National Geographic, 2014b).

Data Analysis- Descriptive Statistical Analysis

In survey research design, the predominant purpose is to describe the data as it answers the research question (Creswell, 2008). As noted by Creswell (2008), also of importance for descriptive statistical analysis is review and consideration of whether the research findings support or disclaim other previous

research findings. The data analysis process for analyzing questionnaire data is outlined in Figure 3.

Step 1: Identify response rate

- Develop table for percent of responses
- Analyze response and non-response rates to target response rate

Step 2: Descriptively analyze the data to identify general trends

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- Calculate and present a table of descriptive statistics for each question on the instrument using frequency tables
- Analyze data to develop a demographic profile of the population
- Analyze data to provide answers to research questions and compare with past research

Step 3: Written presentation of the descriptive results and findings

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- Analyze frequency tables and graphs for trends
- Analyze data using a chi square test to describe proportionate relationships between questions

Figure 3. Recommendation for analyzing questionnaire data. (Creswell, 2008, p. 411)

Specific to this dissertation, statistical analysis, using descriptive statistics specifically frequency of responses by descriptor supported identification of trends in the data that may demonstrate relationships between the characteristics of a school, the school leaders' philosophy of educational purpose, and practices or policies of CPR and AED training of staff or students.

A *chi square test for homogeneity* was run using the Qualtrics (2015) software to identify differences or trends between categories of survey questions (Creswell, 2008). The *chi square test for homogeneity* is used to identify

differences in single-category variables from two different populations (Stat Trek, 2014). For example, in this study the *chi-square test* would identify if the category of school type offering CPR training demonstrated a statistical significance for offering CPR training. For the study, the test was run with an alpha level set at .05 for statistical significance. The alpha level setting is intended to determine the probability of a Type I error, or that the null hypothesis (H_o) is rejected when it is true (Glass & Hopkins, 1996). In a statistical test, the null hypothesis assumes no connection between categories or variables (Trochim, 2006). For example, a null hypothesis statement for the research study could be that there is no difference between school types for offering CPR training to staff. The alternative hypothesis would be that there is a difference between school types for offering CPR training to staff.   With an alpha level set at .05, the null hypothesis is accepted unless the probability of the significance level would make it unlikely to assume the null hypothesis to be true and hence reject the null hypothesis (Creswell, 2008). These statistical tests cannot prove an alterative hypothesis but, through statistical significance, indicate a necessity to reject a null hypothesis (Stat Trek, 2014). With alpha levels set at .05, data analysis can identify a very low risk that the results are due to chance (Creswell, 2008). An alpha level of .05 signifies that 5 out of 100 times the result would be due to chance (Creswell, 2008). Hence any results less than .05 would be highly unlikely due to chance, and indicate a difference from the null hypothesis or rejection of the null hypothesis (Creswell, 2008). The intent of the survey design

data analysis was to use descriptive statistics to identify trends in the measured categories and to provide answers to the research questions.

Reliability and Validity

Reliability and validity are essential components of a research study (Briggs et al., 2012; Crotty, 2011). Ensuring reliability and validity provides integrity for the findings of the study (Briggs et al., 2012). Briggs et al. (2012) indicated that reliability, along with validity are the primary reference for the adequacy of the research study. Specifically, reliability refers to the stability and consistency of findings (Briggs et al., 2012). Areas to be addressed in the reliability of the study ensure similar results could be replicated. Specific areas of consideration to ensure reliability will include equivalency, items that measure equivalent concepts or characteristics; stability or re-test, at another time with the same group the analysis would yield similar results; and internal consistency, the extent the chosen methods are assessing the intended concepts or characteristics (Briggs et al., 2012; Creswell, 2008; Trochim, 2006). The survey data collection process is designed to address these areas of reliability. Non-respondents will also be identified and included in the statistical analysis description. Descriptive analysis identified respondents to non-respondent rates to help ensure an adequate description of non-respondents is captured as it is quite possible that respondents are more likely to have an interest in the topic such as personal experience with sudden cardiac arrest, or a focus on providing CPR training for staff or students than non-respondents (Briggs et al., 2012).

Validity aims to ensure a study actually measured what it intended; in simple terms, that it is truthful. As defined by Crotty (2011), "Validity is used to judge whether the research accurately describes the phenomenon that it intended to describe" (p. 81). The validity of a research study includes these concerns, monitoring potential threats, reducing survey or sampling errors, monitoring response error, and instrument design/survey standardization (Creswell, 2008). To address these potential threats to the validity of the study, this survey research included clear administration procedures for obtaining and contacting the survey population. The survey population was not a sample intended to support generalization to a larger population so analysis was a description of the collected data of respondents. A review of the questionnaire with a survey design expert ensured the survey questions measured what was intended, and a field-test of the survey excluding subjects from the final survey population was conducted. To ensure reliability and validity of the study, these considerations were given priority attention during the development, collection, and analysis of the study.

Personal Stance

As an educational leader and citizen, addressing the issue of sudden cardiac arrest is both a personal and professional interest. As one of only a few SCA survivors in the country, reflection on the near impossibility of my survival is expected. Separating the research from my personal experience is possible but not warranted. This research aimed only to support other victims of SCA to be so fortunate as to be surrounded by bystanders, friends, family, or strangers that are

educated and trained in response to SCA. One of my first memories upon awaking from a three day coma after my SCA was my eldest daughter telling me how, after thirteen minutes of observing me in death, she was so grateful for the training and education she and her father had to keep my body viable for resuscitation upon the arrival of emergency medical services. Yet, despite her gratitude for her family's knowledge and understanding of this emergency, she shared her concern that for most families the loss of their mother would have been the likely outcome. Hence, educational research in the field of school policy and practices is an issue of equity, and one from which as an educational leader, this research is approached from a critical theorist stance.

Conclusion

Sudden cardiac arrest is a medical emergency that takes the lives of more Americans than any other condition (SCAA, 2011). Hence, society must better understand the impact of implementing coordinated response efforts in communities to establish positive survival rates (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Reder & Quan, 2003; SCAF, 2012). Survival rates are increased by specific strategies which hinge on bystander response at the time of SCA (Anderson & Lucia, 2009; Cave et al, 2011; Drezner etal, 2007; Estes, 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF 2012). The best known way to increase effective bystander response is through education of citizens; schools are considered the best place for implementation of the training (Anderson & Lucia, 2009; Cave et al, 2011; Connolly et al., 2007; Drezner et al., 2007; Estes,

2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2012). As stated in the

research problem, as the major educational institution of the country, schools

have an obligation to address these avoidable tragedies and death of citizens

and children from SCA. School and community collaboration, with adequate

planning and training of needed responses, can quite literary save lives in these

cardiac emergencies.

CHAPTER IV

ANALYSIS

Analysis of this survey research included a review of the purpose of the study and the research questions. In this chapter, specifics of the data collection process and the outcomes of that collection process, including analysis of the data, is reviewed. A description of the survey population and the characteristics of respondents are examined. To conclude, collected results are described using descriptive statistical analysis of the data and depicted using frequency tables.

Purpose of the Study and Research Questions

The purpose of this dissertation study was to identify and describe characteristics among Colorado schools that offer cardiopulmonary resuscitation (CPR) training and on-site automated external defibrillators (AEDs). The survey research specifically reviewed trends between school characteristics and sudden cardiac arrest (SCA) training and AED availability in Colorado schools. The following research questions were addressed in the dissertation:

Q1   Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2   Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

Data Collection Procedures

The data collection process for this dissertation began in late February 2015 and concluded in late April 2015. The study used an electronic

questionnaire to gather data from respondents. The data collection process included field-testing the electronic questionnaire, collecting study population contact information, and a three-phase survey collection procedure (Creswell, 2008).

Field Test- Online Questionnaire

Prior to sending the questionnaire to the study population (Colorado school leaders) a field test was conducted. The pilot survey was tested using an electronic questionnaire created in Qualtrics survey software (2015). The trial survey was given over a two week period from February 23, 2015 to March 9, 2015. Respondents to the pilot were chosen by convenience. The respondents were teaching and office staff at a local high school. These respondents were not included in the research study electronic questionnaire email list or in the collected results for the study. The field test was an essential component to the data collection process as changes to the lay out of the questionnaire for data analysis purposes were identified from the results. The initial field test demonstrated difficulty with cross-tabulated characteristics of the school and CPR and AED practices. The specific questions in the survey did not change, but the format layout necessitated changes in the layout of the questions. After data were inputted into the survey, an initial attempt at cross-tabulation made it difficult to pull the categories distinct from each other. A few minor changes to the layout and order of the questions in the Qualtrics (2015) collection tool were made that without collected data from the pilot survey would not have been easily recognized. Other small adjustments to wording of the questions were made due

to field test respondent feedback, in order to clarify questions. The field test

process supports validity of the questionnaire with the target population, to test

that data were collecting responses directly related to the research questions as

intended. The pilot also supported the reliability of the research methodology, to

ensure the collection tool could be used consistently to collect the intended data.

Study Population Contact Information

The next phase of data collection was to gather the email listings for the

study population. The study population included school leaders, principals, heads

of schools and directors from Colorado schools (public, public charter, public

alternative, or independent/private schools at all grade levels and primary,

middle, and secondary grade levels). Initially, an attempt was made to extract

contact information from the Colorado Department of Education (CDE) public

records database for each of these school types. These records are available but

contained only email for superintendents or office contacts. Physical addresses

and phone numbers for school level contacts were listed, but no email was

associated with the school level contact. A spreadsheet was created with each

school district or governing school body and the listing of individual schools and

school leaders. Then a process of collecting the emails from each website for

school leader's email contact was initiated. After nearly a week of the process, a

little more than one hundred email addresses were documented out of an

estimated 1,850 possibilities.

After research into other online options for collecting contact information, a

service called Marketing Emaillist (2015) was identified. The company provides

contact information for both private and public school leaders, and included

names, email addresses, website addresses, physical addresses, phone

numbers, district information, school type, including, public, public charter, public

alternative, independent/private schools and grade levels served. The service

provided an Excel database for Colorado school leaders that included 1,876

separate email contacts. A review of known school leaders' email were cross-

referenced to the database collected from reviewed website contact listings and

from CDE listings; all 15 contacts reviewed were correct. The email database

was then uploaded into Qualtrics (2015) panel for data collection purposes.

Following Creswell's (2008) recommendation, the collection period

occurred over six weeks duration from March 12, 2015 to April 27, 2015 using

the following three-phase survey administration procedure:

- Step 1: First email of questionnaire, sent March 12, 2105- 2 weeks
- Step 2: Second email of questionnaire, sent April 2, 2015- 2 weeks
- Step 3: Questionnaire completion reminder email, sent April 13, 2015- 2 weeks
- Survey closed April 27, 2015

Creswell's (2008) three-phase survey administration procedure is designed to

enhance response rates.

During the collection period, 1,876 emails were sent on April 12, 2015. Of

those 1,876 emails, 72 email contacts bounced or were undeliverable. Also

during the collection, four school districts asked for removal from the research

email list due to policy requirements for conducting research in the school district.

The removed districts included the following: Adams 14 School District, 12

possible respondents removed; Aurora School District, 55 possible respondents

removed; Jefferson County School District, 146 possible respondents removed;

and Boulder Valley School District, 61 possible respondents removed. A total of

346 of the initial 1,876 possible respondents were excluded from the survey

population leaving a total 1,530 possible respondents in the survey population.

Response Rates

A strong response rate is an important part of the data collection in survey

data collection (Creswell, 2008; Groves, 2006; Stoop, 2005). A general

recommendation is that adequate survey response rates should be between

50%-70% (Babbie, 1990; Bailey, 1987; Nulty, 2008; Schutt, 1999). However, it is

well documented that response rates for online questionnaires are often much

lower, less than 30% compared to other survey collection methods (Hager,

Wilson, Pollak, & Rooney, 2003; Nulty, 2008; Stoop, 2005). In addition, surveys

designed to collect organizational information regarding practice or policy, as

opposed to personal information or opinions, historically have the lowest

response rates, nearing 15% (Hager et al., 2003). Because of these trends,

rates as low as 15% for such data collection conditions have been considered

acceptable (Hager et al., 2003). For this survey research, a total 221

respondents begun the survey and answered at least one question, establishing

a response rate of 14% (221/1530). Totals for each category reflected the

responses for each question in the survey (see Appendix C). This rate is not near

the desired response rate of 50% but is an acceptable rate for expected

response rates for online questionnaires regarding organizational practices

(Babbie, 1990; Bailey, 1987; Hager et al., 2003; Nulty, 2008; Schutt, 1999;

Stoop, 2005). For the purpose of this study, to describe the characteristics of

respondents to the questionnaire, the response rate will suffice. Although the response rate provides enough data to describe potential trends in the data collected, responses should not be considered indicative of a larger population. The responses of this survey are only indicative of the participants who responded to the survey and should not be generalized to the population.

Description of the Study Population

The research design collected characteristics of schools offering cardiopulmonary resuscitation training and on-site automated external defibrillator availability. The following data provide a description of the population of respondents completing the survey that are included in the data analysis of results.
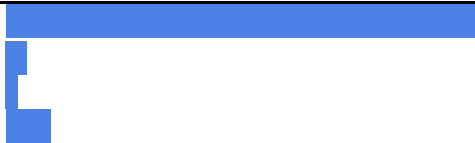
Descriptive Statistics of Respondents

Survey respondents were asked characteristics of the school where they work from three categories, school background information (school leader' position, grade levels served, school type, school region), school demographics of students (socio-economic status, minority population, ethnicity), and school leader philosophy (academic achievement focus or whole-child focus). Of these three categories, the first category background information, provides a basic description of schools that responded to the survey. These school descriptions were used to better understand which schools participated and to cross-tabulate with the other two categories pertaining to demographics and school leader philosophy.

Respondent current positions in the school. The majority of respondents to the question of current position in the school listed themselves as the head of school or school principal, 85% as shown in Table 1. Another 15% of participants listed themselves as other school leaders. This data confirmed that the intended study population of school leaders was likely established.

Table 1

Current Position In The School

Answer	Bar Graph Comparison	Response	%
Principal or Head of School		181	85
Assistant Principal		9	4
Teacher		5	2
Other School Personnel		19	9
TOTAL		214	100

Grade levels served at responding schools. There were 230 responses to grade levels served, more than the total 221 respondents. The question allowed respondents to mark more than one response- all that apply, as schools serve a variety of grade level configurations, hence some participants may have more than one response to the question. The data described in Table 2 demonstrated a variety of grade level schools responding to the survey from primary, middle, high school grade levels as well as other mixed grade level schools.

Table 2

The Grade Levels Served By The School

Answer	Bar Graph Comparison	Response	%
Primary (serves primarily grades K-6)		89	44
Middle (serves primarily grades 5-8)		46	23
Secondary (serves primarily grades 9-12)		45	22
Primary-Middle (serves primarily K-8)		24	12
Primary-Middle-Secondary (primarily grades K-12)		26	13
TOTAL		230	100

* Respondents were able to check all that apply, so total responses (230) are greater than the number of respondents (201) answering the question on the survey

School type of responding schools. Public schools were the majority of respondents. There were three possible categories of public schools (traditional, charter, alternative), 90% respondents were from one of the three categories, shown in Table 3. Only 10% of respondents were from independent schools (private or parochial). Overall, the school type for the research data collected can be described as primarily public schools.

Table 3

The School Type

Answer	Bar Graph Comparison	Response	%
Public school-traditional		146	73
Public school-charter		28	14
Public school-alternative campus		6	3
Non-public school-private/parochial/independent		21	10
TOTAL		201	100

Region served of responding schools. The data collected were a cross-section of regions described by respondents. As depicted in Table 4, the data can be described as representing the variety of regions indicated urban, suburban, rural, and resort. All four districts opting out of the survey were from suburban/urban regions, so their exclusion potentially could have a small impact on the regions represented.

Table 4
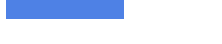
The Region In Which The School Is Located

Answer	Bar Graph Comparison	Response	%
Urban		33	16
Suburban		74	37
Rural		81	40
Resort		13	6
TOTAL		201	100

Demographics- student socio-economic status served of responding schools. Respondents were asked to identify the socio-economic status of the student population served at the school by free and reduced lunch qualification. The data collected from respondents describes a mix of schools serving students in living in poverty as opposed to those not living in poverty according to free and reduced lunch qualification (see Table 5). The data collected describes respondents as nearly equally distributed between students identified as living in poverty to those not in poverty; 45% of respondents indicated the majority of the population they served does not qualified for free and reduced lunch, while a combined 55% indicated that the population is either majority free-reduced (30%) or equally distributed (25%).

Table 5

The Socioeconomic Status Of The Student Population

Answer	Bar Graph Comparison	Response	%
Majority free-reduced lunch qualified		58	30
Majority do not qualify for free-reduced lunch		88	45
Equal distribution of students that do qualify and do not qualify for free and reduced lunch		48	25
TOTAL		194	100

Demographics- student minority group status served of responding schools. Responding schools served primarily non-minority population (67%), while 18% of the respondents described the school as serving majority minority groups, 15% of schools served a student population equally distributed between minority and non-minority groups, as presented in Table 6. The responding population appears to have representation for schools serving both minority and non-minority populations. However in any description in trends of the data, the stronger response rate from non-minority schools should be considered as data from this category of schools has stronger representation.

Table 6

The School Demographic Groups Of The Student Population

Answer	Bar Graph Comparison	Response	%
Majority represent minority groups		35	18
Majority represent non-minority groups		130	67
Equal distribution of students from minority and non-minority groups		29	15
TOTAL		194	100

Demographics- ethnicity of student population served of responding

schools. A majority of participants (70%), represented non-Latino student

populations, more than Latino populations (17%), or equally distributed Latino

and non-Latino populations (13%), as shown in Table 7. The responses to this

question varied by one standard deviation in the response to this question,

indicating that responses from schools serving majority non-Latino student

populations are most prevalent. When reviewing trends in the data, there should

be attention to the smaller response rate from respondents serving a majority of

Latino students in their schools as the category of schools is less represented in

the data.

Table 7

The Ethnicity Of The Student Population

Answer	Bar Graph Comparison	Response	%
Majority Latino		33	17
Majority Non-Latino		135	70
Equal distribution of Latino and Non-Latino students		26	13
TOTAL		194	100

The study population were Colorado school leaders from a variety of

school types and demographics. The responding sample represents school

leaders from primarily public schools, from a cross-section of regions (urban,

suburban, rural, resort), serving kindergarten to twelfth grade, representing

students living in poverty and not living in poverty, that are primarily non-minority

and non-Latino students. In Table 8 a comparison of survey respondents to the

demographics of Colorado school is provided.

Table 8

Colorado School Types & Demographics Compared to Survey Responses of School Types & Demographics

Category	% of CO Schools*	% of All Survey Responses
Public Schools	67	66
Alternative Schools	5	3
Charter Schools	9	13
Private School	7	10
Under High School Age	68	75
High School Age	28	24
Free & Reduced Lunch	42	32
Majority Minority (no ethnicity)	12	19
Majority non-Minority	56	59
Majority Latino	32	18
TOTAL	1,884 schools	221 respondents

*National Center for Education Statistics, Data from CCD: 2012-2013

In addition to respondent population identified trends, the data collected were cross-referenced to answer the research questions based on each of the school descriptors within the school types and school demographics categories.

Results and Analysis by Research Question

Survey research was the methodology for this dissertation, and an online questionnaire was the data collection method using Qualtrics software (2015). The questionnaire was reviewed by a research specialist from the University of Northern Colorado Research Lab and field-tested to support validity of the instrument given the intended target population. The following research questions were addressed in the survey design:

Q1   Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2   Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

Additionally, Qualtrics software (2015) was used to conduct the analysis of the collected data. Descriptive statistics using frequency tables and bar graphs

depict the responses to the research questions, sub-questions and school

descriptor categories. The analysis also includes reviewing trends in the depicted

in cross-tabulation tables. As the variables were binary, yes or no, testing for

differences in the categories of collected data were needed. A *chi-square test of

homogeneity* was run to review possible trends across the categories of

questions and results are shown in tables.

**Characteristics Schools Providing
Cardiopulmonary Resuscitation
Training**

The data collected to answer the research question, "Of respondents,

what are the characteristics of schools that provide CPR training?" are depicted

in the following tables and reviewed for trends. The survey questions identified

CPR training in schools provided to both teachers and students. The trends

between offering CPR training to teachers and to students vary greatly from one

another. These data are important, as training of children- students in schools,

not just adults- staff in schools, is considered to be one of the best approaches to

significantly addressing by-stander response to cardiac emergencies such as

sudden cardiac arrest (Anderson & Lucia, 2009; Cave et al., 2011; Jones, 2011).

The data specified that a majority of the responding schools (75%) do offer

CPR training to teachers as depicted in Table 9. In most cases, CPR training for

teachers was not required for staff, as was indicated by 71% of respondents in

Table 10. Offering CPR training to staff is most often not part of written policy

requirements as indicated by 78% of respondents represented in Table 11.

Table 9

Does The School Offer Cardiopulmonary Resuscitation Training For Teachers?

Answer	Bar Graph Comparison	Response	%
Yes		146	75
No		48	25
TOTAL		194	100

Table 10

Is Cardiopulmonary Resuscitation Training Required For Staff?

Answer	Bar Graph Comparison	Response	%
Yes		40	28
No		104	71
Not sure		2	1
TOTAL		146	100

Table 11

Is Cardiopulmonary Resuscitation Training Required For Teachers In Written Policy?

Answer	Bar Graph Comparison	Response	%
Yes		26	13
No		149	78
Not sure		17	9
TOTAL		192	100

The data trends for training teachers suggest that school and district policy requirements are not the motivator for having school staff trained in CPR for the responding population.   However, in accounting for non-respondents to the survey, it is possible that more respondents that answered the survey do offer CPR training to teachers than not. When respondents interested in a survey provide a significant amount of the data, the data collected is a description of responding participants but should not be interpreted as describing a general

population. As the survey does not intend to generalize to the entire population of Colorado schools, it is unknown if written policies could be a motivator for current rates of CPR training in schools without further research.

Cardiopulmonary resuscitation training of students was uncommon with only 17% of respondents indicating the school offered training to students shown in Table 12. Of those answering that CPR training is offered to students, only one respondent (3%), indicated training was required (see Table 13). Of all respondents, only two (1%) indicated that student training in CPR was part of written policy (see Table 14). The data trends for training students seem to suggest that although CPR is part of the Colorado Academic Standards of learning expected for high school graduates (CO Department of Education, 2013), the skill is rarely taught. Hence, the data may support a need to implement policy requirements to establish a practice for students to be trained in CPR while in school.

Table 12

Does The School Offer Cardiopulmonary Resuscitation Training For Students?

Answer	Bar Graph Comparison	Response	%
Yes		34	18
No		160	82
TOTAL		194	100

Table 13

Is Cardiopulmonary Resuscitation Training Required For Students?
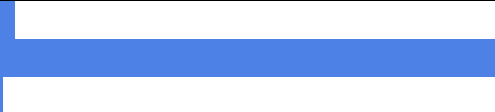
Answer	Bar Graph Comparison	Response	%
Yes		1	3*
No		33	97
Not sure		0	0
TOTAL		34	100

Table 14

Is Cardiopulmonary Resuscitation Training Required For Students In Written Policy?

Answer	Bar Graph Comparison	Response	%
Yes		2	1*
No		186	97
Not sure		4	2
TOTAL		192	100

*In Table 13 Yes represented 1 school and 3% of responses as there were 34 total responses, while in Table 15 Yes represented 2 schools and 3% of responses as there were 192 total responses.

**Trends in the Data of Schools
Providing Cardiopulmonary
Resuscitation Training**

To identify trends in data of schools offering CPR training to either teachers or students, data results were cross-tabulated by categories to depict any possible trends in school characteristics (school background information, school demographics and school leader's philosophy) between schools offering CPR training and those not offering CPR training. For each cross-tabulation, a *chi-square test of homogeneity* χ^2 [DF = (r-1)*(c-1)] , analysis was run to determine the expected consistency of the categories for CPR training for staff and students. The *chi-square test of homogeneity* assumes the null hypothesis is H_0: distribution as expected or there is no difference across categories,

however the alternative hypothesis assumes, H_1: distribution across categories not as expected. With a confidence or alpha set at .05, the null hypothesis is rejected if, *p-value < alpha*. With a .05 confidence level, a *p-value* less than .05 is considered statistically significant hence rejecting the null hypothesis an indication that there is a difference in the distribution of the categories of interest.

It is important to note that one of the assumptions of the *chi square test of homogeneity* is that the number of observed frequencies is greater or equal to five. In cases where there are fewer than five expected observations or responses to category answers, there is a possible risk of inaccurate results of the chi-square test as the assumption of a minimum of five expected responses per category answer is violated. However, for the purposes of the present research, it is not reasonable to collapse categories as the category associations are significantly different (Hardy & Bryman, 2004). An example from the survey is that both offering and not offering CPR cannot be combined, while similarly the cross-tabulation of public school and non-public school categories cannot be combined (see Tables 15-32). Conceptually it would not be appropriate to collapse the categories, however, the *chi square test of homogeneity* should be robust to the violation of this assumption. As noted in the following research data tables of the *chi-square test of homogeneity* analysis, in cases where there are less than five observations or responses to category answers, there is a possible risk of inaccurate results of the *chi-square test* as the assumption of a minimum of five responses per category answer is violated so these results should be interpreted with some caution.

School background data- based on response to cardiopulmonary resuscitation training for staff and student. The questionnaire examined characteristics of the school background information the respondent represented. These characteristics of the school included the following categories, grade levels served (primary, middle, secondary), school-type (public, public charter, public alternative, or independent/private schools), and school region served (urban, suburban, rural, resort). In Tables 15-32 data depicting the characteristic categories of the responding schools and the responses to CPR training and AED availability are shown.

In the tables that follow, some trends are detected. According to respondent data, schools serving students under high school age offer CPR training to teachers less than the secondary level schools shown in Table 15. Also, the data also indicated that traditional public schools represented 69% of respondents offering CPR training for teachers, while charter schools, private schools and alternative schools combined made up 31% of schools offering CPR training for teachers shown in Table 16. Comparatively, according to respondent data, more schools serving only high school-age students answered yes to offering CPR training to students than schools that included younger grade levels as shown in Table 24. And only respondents from rural and resort regions answered that the schools had written policy requiring training of students in CPR as compered than urban and suburban regions responding schools, see Table 32. However, as indicated later in the chapter, these responses are not indicative of statistical trends for these categories.

Table 15

Offered Cardiopulmonary Resuscitation Training to Staff and Grade Levels

	Does the school offer CPR training for teachers?	
School background category	Yes	No
Primary (serves primarily grades K-6)	56	30
Middle (serves primarily grades 5-8)	37	7
Secondary (serves primarily grades 9-12)	34	9
Primary-Middle (serves primarily K-8)	15	7
Primary-Middle-Secondary (serves primarily grades K-12)	24	2
Total	146	48

Table 16

Offered Cardiopulmonary Resuscitation Training to Staff and School Type

	Does the school offer CPR training for teachers?	
School background category	Yes	No
Public school- traditional	101	39
Public school- charter	24	4
Public school- alternative campus	5	1
Non-public school- private, parochial or independent	16	4
Total	146	48

Table 17

Offered Cardiopulmonary Resuscitation Training to Staff and School Region

	Does the school offer CPR training for teachers?	
School background category	Yes	No
Urban	25	7
Suburban	51	20
Rural	60	18
Resort	10	3
Total	146	48

Table 18

Required Cardiopulmonary Resuscitation Training of Staff and Grade Levels

Grade levels served	Is CPR training required for staff?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	12	44	0
Middle (serves primarily grades 5-8)	9	28	0
Secondary (serves primarily grades 9-12)	11	21	2
Primary-Middle (serves primarily K-8)	9	5	1
Primary-Middle-Secondary (serves primarily grades K-12)	9	14	1
Total	40	104	2

Table 19

Required Cardiopulmonary Resuscitation Training of Staff and School Type

School background category	Is CPR training REQUIRED for staff?		
	Yes	No	Not sure
Public school- traditional	14	85	2
Public school- charter	12	12	0
Public school- alternative campus	3	2	0
Non-public school- private, parochial or independent	11	5	0
Total	40	104	2

Table 20

Required Cardiopulmonary Resuscitation Training of Staff and School Region

School background category	Is CPR training REQUIRED for staff?		
	Yes	No	Not sure
Urban	10	15	0
Suburban	10	41	0
Rural	18	41	1
Resort	2	7	1
Total	40	104	2

Table 21

Written Policy for Cardiopulmonary Resuscitation of Staff and Grade Levels

School background category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	4	72	8
Middle (serves primarily grades 5-8)	7	35	2
Secondary (serves primarily grades 9-12)	10	30	3
Primary-Middle (serves primarily K-8)	9	10	3
Primary-Middle-Secondary (serves primarily grades K-12)	5	17	4
Total	26	149	17

Table 22

Written Policy for Cardiopulmonary Resuscitation of Staff and School Type

School background category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Public school- traditional	9	117	12
Public school- charter	6	20	2
Public school- alternative campus	2	4	0
Non-public school- private, parochial or independent	9	8	3
Total	26	149	17

Table 23

Written Policy for Cardiopulmonary Resuscitation of Staff and School Region

School background category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Urban	6	23	3
Suburban	6	59	4
Rural	10	58	10
Resort	4	9	0
Total	26	149	17

Table 24

Offered Cardiopulmonary Resuscitation Training to Students and Grade Levels

	Does the school offer CPR training for students?	
School background category	Yes	No
Primary (serves primarily grades K-6)	7	79
Middle (serves primarily grades 5-8)	9	35
Secondary (serves primarily grades 9-12)	16	27
Primary-Middle (serves primarily K-8)	3	19
Primary-Middle-Secondary (serves primarily grades K-12)	8	18
Total	34	160

Table 25

Offered Cardiopulmonary Resuscitation Training to Students and School Type

	Does the school offer CPR training for students?	
School background category	Yes	No
Public school- traditional	25	115
Public school- charter	5	23
Public school- alternative campus	2	4
Non-public school- private, parochial or independent	2	18
Total	34	160

Table 26

Offered Cardiopulmonary Resuscitation Training to Students and School Region

	Does the school offer CPR training for students?	
School background category	Yes	No
Urban	6	26
Suburban	14	57
Rural	10	68
Resort	4	9
Total	34	160

Table 27

Required Cardiopulmonary Resuscitation Training of Students and Grade Levels

School background category	Is CPR training required for students?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	0	7	0
Middle (serves primarily grades 5-8)	0	9	0
Secondary (serves primarily grades 9-12)	1	15	0
Primary-Middle (serves primarily K-8)	0	3	0
Primary-Middle-Secondary (serves primarily grades K-12)	0	8	0
Total	1	33	0

Table 28

Required Cardiopulmonary Resuscitation Training of Students and School Type

School background category	Is CPR training required for students?		
	Yes	No	Not sure
Public school- traditional	1	24	0
Public school- charter	0	5	0
Public school- alternative campus	0	2	0
Non-public school- private, parochial or independent	0	2	0
Total	1	33	0

Table 29

Required Cardiopulmonary Resuscitation Training of Students and School Region

School background category	Is CPR training required for students?		
	Yes	No	Not sure
Urban	0	6	0
Suburban	0	14	0
Rural	1	9	0
Resort	0	4	0
Total	1	33	0

Table 30

Written Policy for Cardiopulmonary Resuscitation of Students and Grade Levels Served

	Is CPR training required for students in written policy?		
School background category	Yes	No	Not sure
Primary (serves primarily grades K-6)	1	81	2
Middle (serves primarily grades 5-8)	0	42	2
Secondary (serves primarily grades 9-12)	1	41	1
Primary-Middle (serves primarily K-8)	1	20	1
Primary-Middle-Secondary (serves primarily grades K-12)	1	24	1
Total	2	186	4

Table 31

Written Policy for Cardiopulmonary Resuscitation of Students and School Type

	Is CPR training required for students in written policy?		
School background category	Yes	No	Not sure
Public school- traditional	2	133	3
Public school- charter	0	28	0
Public school- alternative campus	0	6	0
Non-public school- private, parochial or independent	0	19	1
Total	2	186	4

Table 32

Written Policy for Cardiopulmonary Resuscitation of Students and School Region

	Is CPR training required for students in written policy?		
School background category	Yes	No	Not sure
Urban	0	32	0
Suburban	0	69	0
Rural	1	73	4
Resort	1	12	0
Total	2	186	4

According to the *chi-square test of homogeneity* analysis, there is an indication that there is a statistical difference in categories of schools offering CPR training to teachers or students. Depicted in Tables 33-38, the grade levels served of schools indicated a statistical difference in the categories offering CPR training for teachers, χ^2 (4, *N* = 194) = 11.58, *p* =. 02, requiring CPR training for staff, χ^2 (8, *N* = 146) = 23.18, *p* < .0001 and having written policy of CPR training for staff, χ^2 (8, *N* = 192) = 28.21, *p* < .0001. As well, review of the data indicated a statistical difference in categories of school types for required CPR training for staff, χ^2 (6, *N* = 146) = 32.21, *p* < .0001, or for written policy for CPR training for staff, χ^2 (6, *N* = 192) = 28.93, *p* < .0001 also depicted in Table 35. In regards to practices of training students in CPR, the grade level served indicated a significant difference in the categories of response as shown in Table 36. According to the *chi square test of homogeneity*, also shown in Table 38, a significant difference in categories also exists by region for written policies requiring CPR training of students, χ^2 (6, *N* = 192) = 12.68, *p* = .05. When the data analysis has indicated a statistical difference in categories of responses, there is indication for further research to determine which variables are most significant in the categories and for possible correlation of the categories to practice.

Table 33

Chi-Square Test Analysis- Offered Cardiopulmonary Resuscitation Training to Staff And School Background Category

	Grade levels served	School type	School region
Chi Square	11.58	2.83*	.72*
Degrees of Freedom	4	3	3
p-value	.02	.42	.87

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 34

Chi-Square Test Analysis- Required Cardiopulmonary Resuscitation Training of Staff And School Background

	Grade levels served	School type	School region
Chi Square	23.18*	32.21*	10.56*
Degrees of Freedom	8	6	6
p-value	< .001	< .001	.1

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 35

Chi-Square Test Analysis- Written Policy for Cardiopulmonary Resuscitation Training of Staff And School Background Category

	Grade levels served	School type	School region
Chi Square	28.21*	29.93*	8.91*
Degrees of Freedom	8	6	6
p-value	< .001	< .001	.18

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 36

Chi-Square Test Analysis- Offered Cardiopulmonary Resuscitation Training to Students And School Background Category

	Grade levels served	School type	School region
Chi Square	20.41*	1.83*	3.04*
Degrees of Freedom	4	3	3
p-value	< .001	.61	.39

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 37

Chi-Square Test Analysis- Required Cardiopulmonary Resuscitation Training of Students And School Background Category

	Grade levels served	School type	School region
Chi Square	1.43*	.37*	2.47*
Degrees of Freedom	8	6	6
p-value	0.99	1	0.87

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 38

Chi-Square Test Analysis- Written Policy for Cardiopulmonary Resuscitation Training of Students And School Background Category

	Grade levels served	School type	School region
Chi Square	8.23*	2.36*	12.68*
Degrees of Freedom	8	6	6
p-value	.41	.88	.05

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

However, general conclusions from the described trends are made with caution. First, it is unknown if non-respondents to the questionnaire have significant impact on trends in categories. Second, as indicated previously, the χ^2-*test* equation assumes an expected minimum of five responses for each possible category answer and in some case the data collected included fewer than five expected responses for a category answer.

School demographics- comparison of schools based on response to cardiopulmonary resuscitation training for staff or students. The study examined characteristics of the school demographics for which the survey respondent represented. The characteristics of school demographics included the following categories: ethnicity, minority group, and socio-economic status. According to respondent data, offering CPR training for staff is predominate in schools that represent students not living in poverty, non-minority, and non-Latino as depicted in Tables 39-41. Additionally, responses indicated that requirements and written policy to train staff in CPR was more frequently reported in schools that did not represent low socio-economic status, serve a non-minority population, and are primarily non-Latino, also shown in Tables 42-47. However, as displayed in Table 21, responses for student training in CPR is overall very low across all category answers, and while it appears that the frequency of CPR training for students is higher for non-minority, non-Latino schools, the high frequency of not offering CPR training to students in these same schools, demonstrates few trends in these categories.

Table 39

Offered Cardiopulmonary Resuscitation Training to Staff and Socio-economic Status

School demographic category	Does the school offer CPR training for teachers?	
	Yes	No
Majority free-reduced lunch qualified (high poverty)	39	19
Majority DO NOT qualify for free-reduced lunch (low poverty)	71	17
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	36	12
Total	146	48

Table 40

Offered Cardiopulmonary Resuscitation Training to Staff and Minority Groups Served

School demographic category	Does the school offer CPR training for teachers?	
	Yes	No
Majority represent minority groups	18	17
Majority represent non-minority groups	106	24
Equal distribution of students from minority and non-minority groups	22	7
Total	146	48

Table 41

Offered Cardiopulmonary Resuscitation Training to Staff and Student Ethnicity

School demographic category	Does the school offer CPR training for teachers?	
	Yes	No
Majority Latino	19	14
Majority Non-Latino	109	26
Equal distribution of Latino and Non-Latino students	18	8
Total	146	48

Table 42

Required Cardiopulmonary Resuscitation Training of Staff and Socio-economic Status

	Is CPR training REQUIRED for staff?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	8	29	2
Majority DO NOT qualify for free-reduced lunch (low poverty)	20	51	0
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	12	24	0
Total	40	104	2

Table 43

Required Cardiopulmonary Resuscitation Training of Staff and Minority Groups Served

	Is CPR training REQUIRED for staff?		
School demographics category	Yes	No	Not sure
Majority represent minority groups	4	14	0
Majority represent non-minority groups	26	79	1
Equal distribution of students from minority and non-minority groups	10	11	1
Total	40	104	2

Table 44

Required Cardiopulmonary Resuscitation Training of Staff and Student Ethnicity

	Is CPR training REQUIRED for staff?		
School demographic category	Yes	No	Not sure
Majority Latino	3	16	0
Majority Non-Latino	29	79	1
Equal distribution of Latino and Non-Latino students	8	9	1
Total	40	104	2

Table 45

Cardiopulmonary Resuscitation in Written Policy for Staff and Socio-economic Status

School demographic category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	7	47	4
Majority DO NOT qualify for free-reduced lunch (low poverty)	14	66	6
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	5	36	7
Total	26	149	17

Table 46

Cardiopulmonary Resuscitation in Written Policy for Staff and Minority Population Served

School demographic category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Majority represent minority groups	3	30	2
Majority represent non-minority groups	16	100	12
Equal distribution of students from minority and non-minority groups	7	19	3
Total	26	149	17

Table 47

Cardiopulmonary Resuscitation in Written Policy for Staff and Student Ethnicity

School demographic category	Is CPR training required for teachers in written policy?		
	Yes	No	Not sure
Majority Latino	3	28	2
Majority Non-Latino	18	104	11
Equal distribution of Latino and Non-Latino students	5	17	4
Total	26	149	17

Table 48

*Cardiopulmonary Resuscitation Training for Students and Socio-
economic Status*

	Does the school offer CPR training for students?	
School demographic category	Yes	No
Majority free-reduced lunch qualified (high poverty)	11	47
Majority DO NOT qualify for free-reduced lunch (low poverty)	17	71
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	6	42
Total	34	160

Table 49

*Cardiopulmonary Resuscitation Training for Students and Minority Groups
Served*

	Does the school offer CPR training for students?	
School demographic category	Yes	No
Majority represent minority groups	5	30
Majority represent non-minority groups	25	105
Equal distribution of students from minority and non-minority groups	4	25
Total	34	160

Table 50

Cardiopulmonary Resuscitation Training for Students and Student Ethnicity

	Does the school offer CPR training for students?	
School demographic category	Yes	No
Majority Latino	6	27
Majority Non-Latino	23	112
Equal distribution of Latino and Non-Latino students	5	21
Total	34	160

Table 51

Required Cardiopulmonary Resuscitation Training for Students and Socio-economic Status

	Is CPR training REQUIRED for students?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	1	10	0
Majority DO NOT qualify for free-reduced lunch (low poverty)	0	17	0
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	0	6	0
Total	1	33	0

Table 52

Required Cardiopulmonary Resuscitation Training for Students and Minority Groups Served

	Is CPR training REQUIRED for students?		
School demographic category	Yes	No	Not sure
Majority represent minority groups	0	5	0
Majority represent non-minority groups	1	24	0
Equal distribution of students from minority and non-minority groups	0	4	0
Total	1	33	0

Table 53

Required Cardiopulmonary Resuscitation Training for Students and Student Ethnicity

	Is CPR training REQUIRED for students?		
School demographic category	Yes	No	Not sure
Majority Latino	0	6	0
Majority Non-Latino	1	22	0
Equal distribution of Latino and Non-Latino students	0	5	0
Total	1	33	0

Table 54

Written Policy for Cardiopulmonary Resuscitation Training for Students and Socio-economic Status

	Is CPR training required for students in written policy?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	1	56	1
Majority DO NOT qualify for free-reduced lunch (low poverty)	0	86	0
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	1	44	3
Total	2	186	4

Table 55

Written Policy for Cardiopulmonary Resuscitation Training for Students and Minority Groups Served

	Is CPR training required for students in written policy?		
School demographic category	Yes	No	Not sure
Majority represent minority groups	0	33	2
Majority represent non-minority groups	1	125	2
Equal distribution of students from minority and non-minority groups	1	28	0
Total	2	186	4

Table 56

Written Policy for Cardiopulmonary Resuscitation Training for Students and Student Ethnicity

	Is CPR training required for students in written policy?	
School demographic category	Yes	No
Majority Latino	0	31
Majority Non-Latino	1	131
Equal distribution of Latino/Non-Latino students	1	24
Total	2	186

What the respondent data did describe clearly in regards to CPR training offered to students is that few schools representing any of the demographic categories offered the training. Hence, in terms of cardiopulmonary resuscitation training for students in schools, there appeared to be a need to increase access for all schools regardless of demographic representation.

According to the *chi-square test of homogeneity* analysis, there is an indication that there is only statistical difference in demographic categories of schools CPR training practice for teachers. Depicted in Table 57, in the categories of demographic representation of schools, race and ethnicity, the data indicated a statistical difference in CPR training for staff. Specifically, as shown in Table 57, this difference included schools' practice of offering CPR training for staff in schools in relation to the minority group membership of student population χ^2 (2, *N* = 194) = 13.43, *p* < .0001 and ethnicity of student population χ^2 (2, *N* = 194) = 8.23, *p* = .02. For categories requiring CPR training for staff across all categories, socio-economic status of student population, minority group membership of student population and ethnicity of student population; and having written policy of CPR training for staff, socio-economic status of student population minority group membership of student population, ethnicity of student population, no statistical difference was identified.

However, according to the *chi-square test* analysis, there is no indication that there is a statistical difference in demographic categories of schools offering CPR training to students, but this is likely the result of low frequency of offering of CPR to students in all demographic categories. The data displayed in Tables 60-

62 did not suggest statistical differences in demographic categories of schools offering, requiring, or having written policy of CPR training of students. Across all demographic categories, students are seldom offered CPR training in schools. For categories requiring CPR training for staff across all categories, socio-economic status of student population, minority group membership of student population and ethnicity of student population; and having written policy of CPR training for staff, socio-economic status of student population minority group membership of student population, ethnicity of student population, no statistical difference was identified. The data displayed in Table 59 did not suggest statistical differences in demographic categories of schools offering, requiring, or having written policy of CPR training of students. Across all demographic categories, students are seldom offered CPR training in schools.

Table 57

Chi-Square Test Analysis- Offered Cardiopulmonary Resuscitation Training to Staff And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	3.39	13.34	8.23
Degrees of Freedom	2	2	2
p-value	.18	< .001	.02

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 58

Chi-Square Test Analysis- Required Cardiopulmonary Resuscitation Training for Staff And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	6.80*	6.78*	7.21*
Degrees of Freedom	4	4	4
p-value	.15	1.5	.13

Table 59

Chi-Square Test Analysis- Written Policy for Cardiopulmonary Resuscitation Training of Staff And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	3.43*	4.49*	3.43*
Degrees of Freedom	4	4	4
p-value	.49	.34	.49

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 60

Chi-Square Test Analysis- Offered Cardiopulmonary Resuscitation Training to Students And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	1.12	.80	.08*
Degrees of Freedom	2	2	2
p-value	.57	.67	.96

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 61

Chi-Square Test Analysis- Required Cardiopulmonary Resuscitation Training Offered To Students And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	2.15*	.37*	.49*
Degrees of Freedom	4	4	4
p-value	.71	.98	.97

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 62

Chi-Square Test Analysis- Written Policy for Cardiopulmonary Resuscitation Training of Students And School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	7.70*	5.08*	6.56*
Degrees of Freedom	4	4	4
p-value	.10	.28	.16

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

School leader philosophy- comparison of schools based on response to cardiopulmonary resuscitation training for staff or students. The questionnaire assessed characteristics of the respondent's school leader philosophy. These characteristics of the school leader philosophy included the following categories, academic achievement focus or whole-child focus. According to respondent data a vast majority, 91%, of the 191 responding school leaders, indicated a school philosophy based on the whole-child approach as opposed to only 9% of respondents indicating an academic achievement focus. Hence, there is little difference between frequency of responses in regards to CPR training

practices for either staff or students and the school leader's philosophy. Any

conclusions about the frequency of the school leader's philosophy should be made

with caution, as data were so far one-sided that questionnaire non-respondents

might have an impact on school leader philosophy choice. As the survey reviews

educational practices outside of the typical academic preparation of schools, it is

unclear if there is response-bias to the question based on the population that

completed the survey as compared to those that did not. According to the *chi-*

-square test of homogeneity analysis, there is no indication of a statistical

difference in the school leader philosophy categories of schools offering CPR

training in either regards to training of staff, χ^2 (1, *N* = 191) = 2.38, *p* = .12 and

training of students, χ^2 (1, *N* = 191) = 0.01, *p* = .94, the null hypothesis is as

expected across category answers. However as stated previously, because of the

large representation of only one category answer, it is unknown if survey

response-bias may have impacted the results.

Table 63

Offered Cardiopulmonary Resuscitation Training to Staff and School Leader Philosophy

	A school's primary purpose is to support student's individual achievement and growth in academic skills: reading, writing, arithmetic.		A school's primary purpose is to support the development of the whole child including equal attention to: social, emotional, academic and civic skills.	
Does the school offer CPR training for teachers?	Frequency	%	Frequency	%
Yes	11	61.11	134	77.46
No	7	38.89	39	22.54

Table 64

Offered Cardiopulmonary Resuscitation Training to Students and School Leader Philosophy

Does the school offer CPR training for students?	A school's primary purpose is to support student's individual achievement and growth in academic skills: reading, writing, arithmetic.		A school's primary purpose is to support the development of the whole child including equal attention to: social, emotional, academic and civic skills.	
	Frequency	%	Frequency	%
Yes	3	16.67	30	17.34
No	15	83.33	143	82.66

Characteristics of Schools with Available On-site Automated External Defibrillators

The data collected to answer the research question, "Of respondents, what are the characteristics of schools that have an on-site AEDs"? are depicted in the following tables and reviewed for trends. The survey questions identified on-site AEDs in schools as well as sub-questions related to AED training in schools. The research question is primarily interested in the availability of on-site AEDs in schools. However, training data is included as supplemental information. Data for on-site AED availability in public-use buildings, including schools, is important as the immediacy of which AEDs are employed in a cardiac emergency has a significant impact on survival rates (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; Reder & Quan, 2003; Rice, 2013). The data specified that a majority of the responding schools (82%), do have on-site AEDs as depicted in Table 65.

Additionally, the survey indicated that responding schools (78%), also offer AED deployment training as indicated in Table 66. As shown in Table 67, it remained inconclusive if schools have on-site AED availability required by written policy, with 49% responding no and 50% responding yes or not sure. The data does not suggest a relationship between having on-site AEDs and policy requirements for them. This data may be important as AED availability campaigns are often focused on development of policy and for legal requirements (National Conference of State Legislators, 2013).

Table 65

Does The School Have An On-site Automated External Defibrillator?

Answer	Bar Graph Comparison	Response	%
Yes		157	82
No		32	17
Not sure		3	2
TOTAL		192	100

Table 66

Does The School Offer Automated External Defibrillator Deployment Training?

Answer	Bar Graph Comparison	Response	%
Yes		123	78
No		25	16
Not sure		9	6
TOTAL		157	100

Table 67

Is Availability of An On-site External Defibrillator in Written Policy?

Answer	Bar Graph Comparison	Response	%
Yes		50	26
No		95	49
Not sure		47	24
TOTAL		192	100

Trends in the Data of Schools with Available On-site Automated External Defibrillators

To identify trends in the data, results were cross-tabulated by categories to depict any possible trends in school characteristics (school background information, school demographics and school leader's philosophy) between schools having on-site AEDs and those that do not have on-site AEDs. For each cross-tabulation, a *chi-square test of homogeneity* analysis, χ^2 (degrees of freedom), was run to determine the expected frequencies of a response based on school categories for on-site automated external defibrillators. The *chi-square test* significance level was set at .05. A *p-value* less than .05 is considered statistically significant which means the null hypothesis must be rejected and that there is evidence that the data is distributed differently across categories. As noted in the research data tables of the *chi-square test* data analysis, in cases where there are less than five expected observations or responses to category answers, there is the possibility of risk for inaccurate results of the χ^2 *test of homogeneity*, because it assumes an expected minimum of five responses per category answer.

School background information- based on response to availability of on-site automated external defibrillators. The questionnaire of school background information included the following categories, grade levels served (primary, middle, secondary) school-type (public, public charter, public alternative, or independent/private schools) and school region served (urban, suburban, rural, resort). According to the data presented in Table 68 and Table 74, responding schools with a student population that included students younger than high school age more often have on-site AEDs and more often have written policy requiring on-site AEDs. Depicted in Table 70, schools located in suburban and rural regions indicated a greater frequency of having on-site automated external defibrillators and requirements for this practice than schools in urban or resort regions. While greater response (75%) to having on-site AEDs came from traditional public schools (see Table 69), across school types the frequency was fairly consistent with public schools having AEDs 80% of the time, public charters, 71% of the time, public alternative schools 83% of the time followed by private school at 70% of the time. However, comparing all the traditional public schools responding to written policy requiring automated external defibrillators, only 25% responded yes, compared to 75% of the public school respondents indicating no or not sure (see Table 75). The data challenged the focus on policy requirements for increasing automated external defibrillator access as the data indicates there could be other factors that influence whether schools provide AEDs on-site other than policy requirements (National Conference of State Legislators, 2013).

Table 68

Availability of On-site Automated External Defibrillators and Grade Levels

School background category	Does the school have an AED available on-site?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	66	18	0
Middle (serves primarily grades 5-8)	34	8	2
Secondary (serves primarily grades 9-12)	37	5	1
Primary-Middle (serves primarily K-8)	11	9	2
Primary-Middle-Secondary (serves primarily grades K-12)	23	3	0
Totals	157	32	3

Table 69

Availability of On-site Automated External Defibrillators and School Type

School background category	Does the school have an AED available on-site?		
	Yes	No	Not sure
Public school- traditional	118	18	2
Public school- charter	20	7	1
Public school- alternative campus	5	1	0
Non-public school- private, parochial or independent	14	6	0
Total	157	32	3

Table 70

Availability of On-site Automated External Defibrillators and School Region

School background category	Does the school have an AED available on-site?		
	Yes	No	Not sure
Urban	21	11	0
Suburban	60	8	1
Rural	67	9	2
Resort	9	4	0
Total	157	32	3

Table 71

Training for Automated External Defibrillator Deployment and Grade Levels

School background category	Does the school offer AED deployment training?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	49	14	3
Middle (serves primarily grades 5-8)	29	2	3
Secondary (serves primarily grades 9-12)	31	3	3
Primary-Middle (serves primarily K-8)	8	3	0
Primary-Middle-Secondary (serves primarily grades K-12)	18	3	2
Total	123	25	9

Table 72

Training for Automated External Defibrillator Deployment and School Type

School background category	Does the school offer AED deployment training?		
	Yes	No	Not sure
Public school- traditional	89	21	8
Public school- charter	19	1	0
Public school- alternative campus	4	0	1
Non-public school- private, parochial or independent	11	3	0
Total	123	25	9

Table 73

Training for Automated External Defibrillator Deployment and School Region

School background category	Does the school offer AED deployment training?		
	Yes	No	Not sure
Urban	18	2	1
Suburban	49	8	3
Rural	52	13	2
Resort	4	2	3
Total	123	25	9

Table 74

Written Policy for On-site Automated External Defibrillators and Grade Levels

School background category	Is the availability of an on-site AED in written policy?		
	Yes	No	Not sure
Primary (serves primarily grades K-6)	17	40	27
Middle (serves primarily grades 5-8)	16	25	3
Secondary (serves primarily grades 9-12)	14	19	10
Primary-Middle (serves primarily K-8)	9	12	1
Primary-Middle-Secondary (serves primarily grades K-12)	5	12	9
Total	50	95	47

Table 75

Written Policy for On-site Automated External Defibrillators and School Type

School background category	Is the availability of an on-site AED in written policy?		
	Yes	No	Not sure
Public school- traditional	35	59	44
Public school- charter	5	23	0
Public school- alternative campus	1	4	1
Non-public school- private, parochial or independent	9	9	2
Total	50	95	47

Table 76

Written Policy for On-site Automated External Defibrillators and Region

School background category	Is the availability of an on-site AED in written policy?		
	Yes	No	Not sure
Urban	7	17	8
Suburban	19	35	15
Rural	23	35	20
Resort	1	8	4
Total	50	95	47

According to the *chi-square test of homogeneity* analysis, there is an indication that there is a statistical difference in categories of schools with requirements for the availability of on-site AEDs and written policy for having on-site AEDs. Data demonstrated that the grade levels served of schools indicated a statistical difference in the categories, for schools having on-site AEDs, χ^2 (8, N = 192) = 25.56, p < .0001 and for schools requiring on-site AEDs in written policy χ^2 (8, N = 192) = 19.18, p = .01. In regards to written policy, there is also statically significant differences in responses by category for the school types, χ^2 (6, N = 192) = 23.25, p < .0001. The region of the school also demonstrated a significant difference in category responses regarding availability of onsite AEDs, χ^2 (6, N = 192) = 12.74, p = .05 and for training in the use of AED deployment, χ^2 (6, N = 157) = 16.01, p = .01.   Data indicates school background information has implications for on-site AED availability, training and written policy.

School demographics- comparison of schools based on response to availability of on-site automated external defibrillators. The questionnaire studied characteristics of the school demographics for the research survey. The characteristics of school demographics included, ethnicity, minority group, and poverty indicator. According to respondent data represented in Table 78, on-site automated external defibrillator availability is predominate in schools that represent non-minority student populations. However, the data does not clearly describe a trend in other demographic categories such as socio-economic status

or Latino populations served. Additionally, survey answers indicated that written policy for on-site AED availability was consistently low in frequency in schools serving non-minority populations (21%) and those with majority (45%) or mixed minority student (24%) populations as shown in Table 84 .

Table 77

Availability of On-site Automated External Defibrillators and Socio-economic Status

	Does the school have an AED available on-site?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	42	15	1
Majority DO NOT qualify for free-reduced lunch (low poverty)	75	10	1
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	40	7	1
Total	157	32	3

Table 78

Availability of On-site Automated External Defibrillators and Minority Groups Served

	Does the school have an AED available on-site?		
School demographic category	Yes	No	Not sure
Majority represent minority groups	22	11	2
Majority represent non-minority groups	111	16	1
Equal distribution of students from minority and non-minority groups	24	5	0
Total	157	32	3

Table 79

Availability of On-site Automated External Defibrillators and Student Ethnicity

	Does the school have an AED available on-site?		
School demographic category	Yes	No	Not sure
Majority Latino	22	10	1
Majority Non-Latino	113	18	2
Equal distribution of Latino and Non-Latino students	22	4	0
Total	157	32	3

Table 80

Training for Automated External Defibrillator Deployment and Socio-economic Status

	Does the school offer AED deployment training?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	29	9	4
Majority DO NOT qualify for free-reduced lunch (low poverty)	66	7	2
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	28	9	3
Total	123	25	9

Table 81

Training for Automated External Defibrillator Deployment and Minority Groups Served

	Does the school offer AED deployment training?		
School demographic category	Yes	No	Not sure
Majority represent minority groups	15	4	3
Majority represent non-minority groups	91	16	4
Equal distribution of students from minority and non-minority groups	17	5	2
Total	123	25	9

Table 82

Training for Automated External Defibrillator Deployment and Student Ethnicity

	Does the school offer AED deployment training?		
School demographic category	Yes	No	Not sure
Majority Latino	15	4	3
Majority Non-Latino	92	16	5
Equal distribution of Latino and Non-Latino students	16	5	1
Total	123	25	9

Table 83

Written Policy for On-site Automated External Defibrillators and Socio-economic Status

	Is the availability of an on-site AED in written policy?		
School demographic category	Yes	No	Not sure
Majority free-reduced lunch qualified (high poverty)	19	22	17
Majority DO NOT qualify for free-reduced lunch (low poverty)	22	48	16
Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch	9	25	14
Total	50	95	47

Table 84

Written Policy for On-site Automated External Defibrillators and Minority Groups Served

	Is the availability of an on-site AED in written policy?		
School demographic category	Yes	No	Not sure
Majority represent minority groups	16	12	7
Majority represent non-minority groups	27	70	31
Equal distribution of students from minority and non-minority groups	7	13	9
Total	50	95	47

Table 85

Written Policy for On-site Automated External Defibrillators and Student Ethnicity

	Is the availability of an on-site AED in written policy?		
School demographic category	Yes	No	Not sure
Majority Latino	13	12	8
Majority Non-Latino	29	72	32
Equal distribution of Latino and Non-Latino students	8	11	7
Total	50	95	47

The *chi-square test of homogeneity* analysis for school demographic

categories and on-site AEDs, suggested that there is a statistical difference in

demographic categories of schools practice and policy regarding on-site AEDs.

According to the *chi-square test of homogeneity* analysis and represented in

Table 86 for the category answers of schools serving minority or non-minority

populations served, a statistical difference, χ^2 (4, *N* = 192) = 12.65, *p* = .01 exists

for AED on-site availability, additionally a statistical difference exists between

categories for AED written policy requirements, χ^2 (4, *N* = 192) = 9.71, *p* = .05.

Table 86

Chi-square Test Analysis- Availability of On-site Automated External Defibrillators and School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	5.50*	12.65*	6.47*
Degrees of Freedom	4	4	4
p-value	.24	.01	.17

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 87

Chi-square Test Analysis- Training for Automated External Defibrillator Deployment and School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	8.14*	4.80*	4.23*
Degrees of Freedom	4	4	4
p-value	.09	.31	.38

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Table 88

Chi-square Test Analysis- Written Policy for On-site Automated External Defibrillators and School Demographics

	Socio-economic status	Minority groups served	Ethnicity
Chi Square	6,51	9.71	5.47
Degrees of Freedom	4	4	4
p-value	.16	.05	.24

School leader philosophy- comparison of schools based on response to availability of on-site automated external defibrillators. The questionnaire surveyed characteristics of the respondent's school leader philosophy. These characteristics of the school leader philosophy included categories based on academic achievement focus or a whole-child focus. According to the collected data as displayed in Table 89, most all responding school leaders (173), specified a school philosophy based on the whole-child approach as opposed to respondents (18), that specified an academic achievement focus, making it difficult to establish a comparison between rate of responses in regards to onsite AED practice and the school leader's philosophy. As the data regarding school leader philosophy responses have little variation,

respondents to the survey might have an impact on school leader philosophy choice. Because the survey collects information on educational practices outside of traditional academic preparation, it is unknown if there is response-bias to the question based on the population that completed the survey.

Table 89

Availability of On-site Automated External Defibrillators and School Leader Philosophy

	A school's primary purpose is to support student's individual achievement and growth in academic skills: reading, writing, arithmetic.		A school's primary purpose is to support the development of the whole child including equal attention to: social, emotional, academic and civic skills.	
Does the school have available an AED on-site?	Frequency	%	Frequency	%
Yes	17	61.11	139	77.46
No	1	38.89	31	22.54
Not Sure	0	0.00	3	1.73

As pertains to school leader philosophy and AED availability in the schools, the *chi-square test of homogeneity* analysis, did not demonstrate a statistical difference in categories responses of schools offering on-site AED availability, χ^2 (2, N = 191) = 2.20, p = .33, AED deployment training, χ^2 (2, N = 156) = 1.17, p = .56 or written policy requiring AEDs, χ^2 (2, N = 191) = 0.24, p = .89 shown in Table 90. Again caution should be used in drawing any conclusions between this data as it is unknown if survey response-bias may have impacted the results.

Table 90

Chi-square Test Analysis- Availability of On-site Automated External Defibrillators and School Leader Philosophy

	Available On-site Automated External Defibrillators	Automated External Defibrillators Deployment Training	On-site Automated External Defibrillators in Written Policy
Chi Square	2.20*	1.17*	.24*
Degrees of Freedom	2	2	2
p-value	.33	.56	.89

*Note: The Chi-Square approximation may be inaccurate - expected frequency less than 5.

Conclusion

As the major educational institution of the country, schools have an obligation to address avoidable tragedies and death of citizens and children from sudden cardiac arrest. As the medical community has identified specific best practices to address this need, a review of these practices and policy in Colorado schools provides significant information (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014). CPR training and AED availability are documented as positively impacting outcomes in cardiac emergencies, the data collected from this survey research was aimed to answer two research questions:

Q1   Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2   Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

The data collected and the data analysis revealed that there were significant statistical differences for CPR training and on-site AED availability in responding Colorado schools regarding characteristics of the responding schools (primary, middle, secondary, public, public charter, public alternative, or independent/private; ethnicity, minority group, poverty indicator). The data analysis did not indicate significant statistical differences for CPR training or for on-site AED availability with school leadership educational philosophy (academic achievement focus or whole-child focus). The data collected and the data analysis revealed additional research needs and areas to explore in school practice and policy that may be of beneficial support for the public health initiative to increase national survival rates and health outcomes from sudden cardiac arrest.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

School safety is always a top priority of concern for educational leaders. Addressing safety issues requires schools to collaborate with local emergency response and medical personnel to ensure the best possible outcomes for students and community members. Additionally, this collaboration affords an opportunity for these organizations to work together and address health and safety issues that impact students and the community. Sudden cardiac arrest (SCA) is the leading cause of death in the United States and is one of these significant health and safety issues of concern (SCAA, 2011). When schools work together with community health and safety organizations to ensure the best responses to these cardiac emergencies, lives can be saved.

Research Summary

A significant amount of research has identified schools as the best place to support increasing survival rates from SCA (Anderson & Lucia, 2009; Hazinski et al., 2004; Smith, 2003). Medical research has shown that by-stander reactions in cardiac emergencies significantly impacts outcomes in these emergencies, and schools can act as a primary institution to support community objectives for best practices in response (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014). This dissertation aimed to add to the body of knowledge available in

educational research to support educating the citizenry about needed emergency response to sudden cardiac arrest by understanding current practice in Colorado schools.

Statement of the Problem

As the leading cause of death in the United States, SCA victims come from all age, gender, socio-economic, nationality, ethnic, and racial populations (SCAA, 2011). Sudden cardiac arrest is consequently a serious public health issue. In addition, there exist health inequities for survival rates, with higher rates of occurrence and lower bystander response rates for minority groups and impoverished victims of SCA (Sasson et al., 2013). Additionally, these sudden deaths include 7,000 children, with the most common location for these deaths occurring in schools (Anderson & Lucia, 2009, p. 14). Comprehensive school crisis planning policy that includes practices that focus on addressing emergency response, cardio-pulmonary resuscitation (CPR) skills training, timely deployment of an automated external defibrillator (AED) and cardiac emergency awareness has the potential for life saving outcomes (Anderson & Lucia, 2009; Bosher et al., 2004; Cave et al., 2011; CASB, 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014; Smith, 2003). Consequently, there is a problem to be addressed; as the major educational institution of the country, K-12 schools, which collectively serve a vast majority of the population, have an obligation to address avoidable tragedies and death of citizens and children from sudden cardiac arrest.

Background

Sudden cardiac arrest is an abrupt malfunction of the electrical impulses of the heart; patients lose consciousness immediately with virtually no warning signs. In most cases, within 10 minutes, most victims will die and in less than five minutes severe damage to the vital organs, including the brain will take affect (Save a Life Pitkin County, 2012). SCA may be due to known or unknown congenital heart conditions, most commonly an arrhythmia, an enlarged heart, coronary artery or valvular disease, or other secondary factors such as drug-induced reactions or sport-injury-induced arrests (Mayo Clinic, 2014). Unlike heart attacks, SCA is rarely a condition of getting old, poor health, or dietary issues (Anderson & Lucia, 2009). As its name suggests, SCA onset is unexpected and requires immediate attention. Yet, unlike diseases such as breast cancer or AIDS, the needed response to cardiac arresst is well understood and appropriate intervention can make survival more likely (SCAA, 2011). As a medical emergency that has known available treatment, a better understanding of the influence school and community collaboration, specifically health education policy and practices can have on sudden cardiac arrest outcomes is necessary.

Purpose of the Study

The purpose of this educational research study was two-fold. First, to collect data from Colorado schools regarding the implementation of recommended sudden cardiac arrest responses, specifically cardiopulmonary resuscitation training and automated external defibrillator accessibility and,

second, to describe characteristics of the school organization relative to their responses regarding cardiac emergency practices and policy. Relationships between the descriptors of an organization such as perceptions, philosophy, program model, demographics, policy, and practice can provide insight into otherwise unnoticed influential factors at play that might influence the development and implementation of policy. This dissertation adds to the body of educational research regarding possible identified trends between these types of descriptors and the practices for training staff and students in CPR as well as availability of AED in schools.

Research Questions

One intention of educational research is to support the body of knowledge in both the field of educational policy and leadership (Briggs, Coleman & Morrison, 2012), and, toward that purpose, this dissertation was designed to answer the following questions:

Q1   Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training?

Q2   Of respondents, what are the characteristics of schools that have an on-site automated external defibrillator?

Methodology

The research questions include descriptions of the characteristics of a population, schools offering CPR education to staff or students and schools with on-site AEDs. The primary intent of this dissertation was to understand the variables of schools and their practices of providing CPR education to staff and students along with AED availability. Survey research design is typically the

methodology for identifying trends in data (Creswell, 2008). For this study, the survey design supported identification of the characteristics of the school (primary, middle, secondary, public, public charter, public alternative, or independent/private; ethnicity, minority group, poverty indicator) and the school leadership educational philosophy (academic achievement focus or whole-child focus) with the training of staff or students in CPR and AEDs. Specifically, this survey research collected information regarding current practices in schools and beliefs of school leaders, therefore the study is a cross-sectional survey of attitudes and practice as is applicable to the research questions. Survey data about practices and beliefs of school leaders have the potential to describe possible relationships between variables. However, association of these variables in survey research is primarily intended to further understand and describe the population rather than relate the variables or predict outcomes (Creswell, 2008).

The research questions for the study were approached from a critical stance with a concern that there could exist injustice for some groups (Crotty, 2011). While this survey research was intended to help identify and describe associations between access to practices, CPR training and on-site AEDs related to sudden cardiac arrest in schools and school characteristics, if such relationships are indicated by the data, it is only empirical evidence that describes a need for further possible studies embedded in a critical stance; this study did not intend to identify causality between these trends (Creswell, 2008; Crotty, 2011).

The research method for this survey design was questionnaire. Descriptive statistics were used to analyze the collected data. Responses were collected using an online questionnaire developed in Qualtrics (Version 2015). To provide answers to the research questions, collected data were run through a *chi-square test of homogeneity* in the Qualtrics software to review significance in any difference in categorical responses. The alpha level or confidence level to identify significance was set at .05. To classify responses from the questionnaire, frequency distribution tables along with graphs, were used to simplify the description of the data by using a depiction of the responses across categories of school characteristics (type, demographic, school leader philosophy) and, for each single variable, CPR training for staff, CPR training for students, on-site AED availability, and AED training (Trochim, 2006). Further analysis of the data described identified trends in characteristics of these responses. These findings are intended to support recommendations for educational practice, research, or policy to address the research problem.

Discussion of Findings

Review of the data collected from the online survey revealed both general and specific findings to the research questions. General findings include the overall access to cardiopulmonary resuscitation training and automated external defibrillator availability in Colorado schools, while specific findings demonstrated possible associations between question categories and the responses to the survey. According to the collected data there are some general findings regarding school CPR training and AED availability in Colorado schools and

specific trends that support recommendations for understanding current practices and for further educational research.

Research Questions

Question One: Of respondents, what are the characteristics of schools that provide cardiopulmonary resuscitation training? Generally, respondents indicated that cardiopulmonary resuscitation training was quite often offered to teachers (75%). According to collected data of respondents that indicated CPR training was provided for teachers, in most cases the practice was not required (28%) or mandated in written policy (13%). Comparatively, few respondents indicated offering cardiopulmonary resuscitation training to students (18%). Of those that did offer the training it was almost never required (3%) or mandated in written policy (1%). Generally, offering CPR training to teachers was a common practice of respondents and offering CPR training to students was an uncommon practice of respondents.

Specifically, schools offering cardiopulmonary resuscitation training to teachers were most likely to have served students less than high school age (74%) and represented a school type that was a traditional public school (69%) in contrast to a non-tradition public school i.e. public-charter, public-alternative and non-public schools (31%). However of the respondents offering CPR training, requirements for CPR training and written policy were significantly different for non-traditional schools as to traditional public schools ($p < .0001$). Schools offering CPR training to teachers mostly served students representing non-minority populations (73%) and non-Latino populations (75%). Additionally, 82%

of schools that indicated serving a mostly non-minority group students offered

CPR training to teachers, while only 51% of those serving mostly minority group

students offered CPR training to teachers. Responses for offering CPR training

to teachers as compared to those that did not offer CPR training to teachers was

similar regarding serving non-Latino populations (81%), and Latino populations

(58%). In addition requirements to train staff in cardiopulmonary resuscitation

were was nearly double from schools that served students that do not qualify as

low socio-economic status (50%) as opposed to schools that served students

qualifying as living in poverty (20%). The school leader philosophy of education

for schools offering cardiopulmonary resuscitation training to teachers was

predominantly a whole-child approach (92%), but there was no indication that

this approach was a trend as compared to schools not offering CPR training to

teachers (88%); both schools offering CPR training and not offering CPR training

indicated as a large majority of school leaders with a whole-child approach

(91%). Schools offering cardiopulmonary resuscitation training to students (18%)

were most likely to also serve students of high school age (71%) compared to

those serving student only less than high school age (56%). While CPR training

of students was very rarely required (3%) or in written policy (1%) for those that

did offer the training most were located in suburban (41%) or rural areas (29%).

There was no reportable trend for schools offering CPR training for students in

regards to school demographics. The school leader philosophy for schools

offering CPR training to students was a whole child approach (91%), but the

approach was equally indicated by respondents not offering CPR training to students (91%).

Question Two: Of respondents, what are the characteristics of schools that have on-site automated external defibrillators? Generally, a significant majority of respondents indicated that the school had on-site AEDs (82%) and offered training for use of AEDs (78%), while not many required AED availability in written policy (26%). However, respondents were split on written policy requirements for on-site automated external defibrillators (26%) and those respondents that did not know if it was in written policy requirements (24%). While traditional public schools were the most common school type to have AEDs available on-site (75%); 43% of respondents of traditional public schools indicated it was not required in written policy and 32% indicated they were not sure if it was required by written policy these trends seem to suggest that written policy is not the indicator for automated external defibrillator availability in these schools. Specifically, schools that had on-site AEDs most often served students younger than high school age (71%), were located in suburban (38%) or rural regions (43%) and served non-minority populations (71%). In addition, responding schools that had written policy for AED availability, could be described as serving students less than high school age (82%) located in suburban (38%) or rural areas (46%). Nearly all respondents with on-site AEDs (89%), training for AEDs (89%) and written policy requiring AEDs (90%), also corresponded to have a school leader philosophy based on the whole-child approach. However this approach was also designated as the majority response

to those not having AEDs onsite (97%), not offering training for AEDs (88%), or not requiring AED availability as part of written policy (92%). Overall, 91% of respondents to the survey specified a whole-child approach to educational philosophy as opposed to 9% of all respondents that selected an academic focus approach to educational philosophy, hence no trends are identifiable by school leader philosophy to the survey questions.

Implications

As supported by Briggs, Coleman and Morrison (2012) the survey data from this dissertation generated implications for educational practice, policy and future research. As the respondent data identified statistical differences in responses for demographic categories and staff training in cardiopulmonary resuscitation, policy requirements for training may be necessary. Trends that demonstrate differences in practice for staff development, including CPR staff training in schools serving minority and Latino populations demonstrate critical inequities to be addressed (Crotty, 2011). Research (Frieden, 2011; MedicineNet, 2013; Sasson et al., 2013) indicates health discrepancies in sudden cardiac arrest survival rates for minority and Latino populations, hence the apparent lack of training in school serving these populations is of great concern. Inequities that are not remediated through practice may require policy and external accountability systems to remedy (Anderson & Lucia, 2009; Crotty, 2011; Sasson et al., 2013).

The age served by schools was also statistical difference for training cardiopulmonary resuscitation training of staff and students. As it was indicated

that staff was trained less in high schools, than in schools serving lower grades,

awareness of the importance for addressing the needs of the whole-child,

including health issues might be a solution to increasing training in high schools.

Contrarily, high schools most often reported training students. However, research

indicates that even primary grade children can be trained in appropriate response

to sudden cardiac arrest and can have an impact on survival rates (Connolly et

al., 2007). Again, public awareness of the training of young students could

increase this practice. Most significant to practice is the very low responses from

all schools for training students. CPR training is included in the CO Academic

Standards (2015) as important an important skill for graduates to have, but

despite the standard students from the respondent data are rarely provided the

opportunity to learn the skill. Hence, the push for education policy (Abella, 2015;

AHA, 2011; AHA, 2014b; Kann et al., 2001) that requires CPR training as a

graduation requirement may be a needed requirement to address this

discrepancy.

In regards to AED availability, the push for increased written policy may

not be the best effort. The data respondents indicated that they often had AEDs

on-site despite lack of written policy or knowledge of written policy. Hence, a

better response to provide the school without automated external defibrillators

may be financial supports and subsidies to ensure all schools have access to this

life saving resource. The data collected from this dissertation provided

implications for responses to increase CPR training and AED availability that

might otherwise have been disregarded. The implications of these finding are

great, quite literally life or death, while the ability to develop practice and policy to address inequitable trends in training and access are quite attainable, for this reason, lack of attention to these implications would be iniquitous.

Recommendations for Future Research

An important outcome of educational research is not only to add to the current body of professional knowledge but also to identify needs for further research. Findings from this dissertation have revealed options for continued educational research in the field of sudden cardiac arrest response and training in the schools. From the discussion of the findings, several more questions have been discovered. Possible research questions to be addressed in future studies include the following:

- How can a lack of CPR training for teachers in schools primarily serving minority populations and Latino populations be addressed?

- What can be learned from case studies of successful implementation of training students in CPR and SCA emergency response in the schools?

- What does the comparative data between states with strong policy requirements requiring CPR and AED availability show about actual practice of these requirements in schools?

- For schools that offer CPR training to staff, what is the professional training plan for these practices, including the long-term, on-going professional development plans for CPR training in these schools?

- How are baseline survival rates of sudden cardiac arrest impacted by policy requirements in states with required CPR training for staff or students?

- Is there a correlation between school demographics and CPR training for teachers in schools?

- Is there a correlation between school demographics and AED availability in schools?

- Is there a correlation between school region and CPR training for teachers in schools?

- Is there a correlation between school region and AED availability in schools?

In addition to the survey responses, some respondents also provided voluntary comments or questions (see Appendix G). The comments provide insight to other areas for possible research of reoccurring topics that included: case studies of best practices, the use of cardiopulmonary resuscitation training in special education settings and educational cost benefit analysis.

Conclusion

As the largest cause of death in the United States, sudden cardiac arrest is a serious public health issue (SCAA, 2011). This health issue impacts all ages, genders and demographics (SCAA, 2011). These cardiac emergencies are usually fatal, but education of citizens on appropriate response can greatly increase survival rates (Anderson & Lucia, 2009; Cave et al., 2011; Connolly et al., 2007; Drezner et al., 2007; Hazinski et al., 2004; Lotfi et al., 2007; SCAF, 2014). Medical research has recommended schools as the best available resource to help provide the needed training (Anderson & Lucia, 2009; Hazinski et al., 2004; Smith, 2003). This dissertation reviewed survey data collected from an online questionnaire aimed to better understand the current state of cardiopulmonary resuscitation training and automated external defibrillator availability in Colorado schools. The research revealed that most respondents of the survey offered CPR training to teachers, but few offered CPR training to students. In addition, most respondents had on-site AEDs in their schools. Few school had requirements or written policy for either of these practices. Of most

interest to educational research, the data revealed trends in school characteristics specifically in age group served, demographic population served, and in the region served between schools most likely to offer these cardiac emergency preparedness training and those that do not. These discrepancies expose possible critical inequities in access to this highly endorsed health training. Further research in these identified trends is recommended to better understand the practices and policies that would most support an increase in Colorado schools that offer CPR training to staff and students and to have on-site AEDs.

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APPENDIX A

CARDIAC ARREST AND HEART ATTACK COMPARISON

CARDIAC ARREST VS. HEART ATTACK

People often use these terms interchangeably, but they are not the same.

WHAT IS CARDIAC ARREST?

CARDIAC ARREST occurs when the heart malfunctions and stops beating unexpectedly.

Cardiac arrest is triggered by an electrical malfunction in the heart that causes an irregular heartbeat (arrhythmia). With its pumping action disrupted, the heart cannot pump blood to the brain, lungs and other organs.

Cardiac arrest is an **"ELECTRICAL"** problem.

WHAT HAPPENS

Seconds later, a person becomes unresponsive, is not breathing or is only gasping. **Death occurs within minutes if the victim does not receive treatment.**

WHAT TO DO

CALL 9-1-1 Cardiac arrest can be reversible in some victims if it's treated within a few minutes. First, call 9-1-1 and start CPR right away. Then, if an Automated External Defibrillator (AED) is available, use it as soon as possible. If two people are available to help, one should begin CPR immediately while the other calls 9-1-1 and finds an AED.

CARDIAC ARREST is a LEADING CAUSE OF DEATH.

Nearly **360,000** out-of-hospital cardiac arrests occur annually in the United States

Fast action can save lives.

WHAT IS A HEART ATTACK?

A **HEART ATTACK** occurs when blood flow to the heart is blocked.

A blocked artery prevents oxygen-rich blood from reaching a section of the heart. If the blocked artery is not reopened quickly, the part of the heart normally nourished by that artery begins to die.

A heart attack is a **"CIRCULATION"** problem.

WHAT HAPPENS

Symptoms of a heart attack may be immediate and may include intense discomfort in the chest or other areas of the upper body, shortness of breath, cold sweats, and/or nausea/vomiting. More often, though, symptoms start slowly and persist for hours, days or weeks before a heart attack. Unlike with cardiac arrest, the heart usually does not stop beating during a heart attack. **The longer the person goes without treatment, the greater the damage.**

The heart attack symptoms in women can be different than men (shortness of breath, nausea/vomiting, and back or jaw pain).
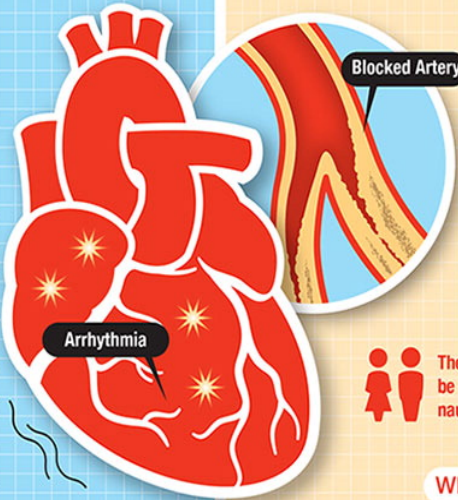
WHAT TO DO

CALL 9-1-1 Even if you're not sure it's a heart attack, call 9-1-1 or your emergency response number. Every minute matters! It's best to call EMS to get to the emergency room right away. Emergency medical services staff can begin treatment when they arrive — up to an hour sooner than if someone gets to the hospital by car. EMS staff are also trained to revive someone whose heart has stopped. Patients with chest pain who arrive by ambulance usually receive faster treatment at the hospital, too.

WHAT IS THE LINK?

Most heart attacks do not lead to cardiac arrest. But when cardiac arrest occurs, heart attack is a common cause. Other conditions may also disrupt the heart's rhythm and lead to cardiac arrest.

Blocked Artery

Arrhythmia

American Heart Association | **CPR & First Aid**

Learn more about CPR or to find a course, go to heart.org/cpr

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(American Heart Association, 2011)

APPENDIX B

UNIVERSITY OF NORTHERN COLORADO INSTITUTIONAL
REVIEW BOARD APPROVAL

UNIVERSITY *of*
NORTHERN COLORADO

Institutional Review Board

DATE: January 16, 2015

TO: Leigh McGown, A Dissertation Proposal Submitted in Partial Fulfillment of the
                   Requirements for the Degree of Doctor of Education
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [646367-2] SCHOOL POLICY AND PRACTICE TO TACKLE A PUBLIC
                   HEALTH PROBLEM: SUDDEN CARDIAC ARREST
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: January 12, 2015

Thank you for your submission of Amendment/Modification materials for this project. The University of
Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to
federal IRB regulations.

Leigh -

**Thank you for swiftly addressing the requests for a draft of your email recruitment letter and
revised consent form. All items have been addressed and your research is verified/approved
exempt.**

**Please be sure to use these drafted and revised materials in your participant recruitment and data
collection.**

**Best wishes with your research and please don't hesitate to contact me with any IRB-related
questions or concerns.**

Sincerely,

Dr. Megan Stellino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please
include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of
Northern Colorado (UNCO) IRB's records.

APPENDIX D

CONSENT FORM FOR RESEARCH PARTICIPATION

UNIVERSITY *of*
NORTHERN COLORADO

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title: School Policy and Practice to Tackle a Public Health Problem:
Sudden Cardiac Arrest
Researcher: Leigh McGown
Phone Number: (970) 948-3581   e-mail: lmcgown@ymhs.org
mcgo6140@bears.unco.edu
Research Advisor: Linda Vogel PhD
Phone Number: (970) 351-2119   e-mail: linda.vogel@unco.edu
Co-Research Advisor: Spencer Weiler PhD
Phone Number: (970) 351-1016   e-mail: spencer.weiler@unco.edu

Cardiac arrest is the leading cause of death in the United States, killing more
than 325,000 each year. Previous research supports that this number could be
lowered by up to 40% with the correct response to this emergency from
bystanders and first responders. This response includes immediate initiation of
cardiopulmonary resuscitation (CPR), calling 911 and using an automated
defibrillator (AED). Schools have been named as the best place to provide the
pubic with information and awareness training in these recommended response
practices to cardiac arrest.

With permission of the University of Northern Colorado and as a doctoral
candidate in the Educational Leadership and Policy Studies Program, I am
conducting research on which schools in Colorado offer CPR training to either
staff or students and which schools have AEDs on site. I am also collecting data
about responding schools' demographics and the school leader's philosophy on
education.

As a participant in this research, you will be asked to respond to a survey. The
tool to collect data for this survey is an online questionnaire that consists of eight
background questions regarding your school, nine yes/no questions regarding
CPR and AED practice and policy in your school, and one question on your
personal belief regarding school purpose.

For the survey, each school will be given a unique identifier that will be coded to

connect the email sent to the questionnaire identifier. You will be asked to identify your position at the school, but will not be asked to provide your name. Your responses will be confidential. Results of the study will be presented in group form only (e.g., response frequency, averages). Online responses will accessed only by the researcher through a password secured program and codes will be stored on a locked private computer of the researcher. Any original paperwork will be kept in a locked cabinet by the researcher.

There does not appear to be any foreseeable risks to participation, however a foreseeable benefit is possible if findings can support increased training of bystanders in CPR and AEDs.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above, please complete the questionnaire if you would like to participate in this research. By completing the questionnaire, you will have given permission for your participation.

If you have any concerns about your selection or treatment as a research participant, please contact the Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-2161. Please do not hesitate to contact the researcher via phone or email if you have any questions or
concerns about the method used to conduct this study. Please feel free to copy this letter and keep it for your
records.

Thank you for assisting

APPENDIX C

SURVEY SAMPLE- QUALTRICS (2015)
ELECTRONIC QUESTIONNAIRE

Wes Leonard, 16, died of cardiac arrest while playing basketball last Thursday… His wasn't the only sudden death among sports-playing U.S. high schoolers in the last two weeks. Matthew Hammerdorfer, 17, died playing rugby in Fort Collins, Colorado, due to cardiac arrest from a congenital heart defect. In North Carolina, 16-year-old Javaris Brinkley died of heart failure after playing basketball at a church Monday; and 17-year-old soccer and track star Sarah Landauer of Gainesville, Florida, collapsed at track practice; she died Wednesday…Although four deaths in two weeks may seem like a lot, it's consistent with the national average for scholastic athletes. Sudden cardiac arrest (SCA) is the leading cause of death in the U.S., but when ordinary people, not just doctors and emergency medics,
know cardiopulmonary resuscitation (CPR), a victim's survival rate can double, or even triple. Schools are adding thousands of lifesavers to our communities by training their students, faculty and staff in CPR.

Q1 Current position in the school you represent:
❑ Principal or Head of School (1)
❑ Assistant Principal (2)
❑ Teacher (3)
❑ Other School Personnel (4) _____

Q2 The grade levels served by the school would best described as (check all that apply):
❑ Primary (serves primarily grades K-6) (1) _____
❑ Middle (serves primarily grades 5-8) (2) _____
❑ Secondary (serves primarily grades 9-12) (3) _____
❑ Primary-Middle (serves primarily K-8) (4) _____
❑ Primary-Middle-Secondary (serves primarily grades K-12) (5)

_____

Definitions: Public school- traditional. A Colorado public school is an institution that receives the majority of its funding from moneys raised by a general state, county, or district tax and whose property is operated by a political subdivision of the state and: Is an autonomous entity of a preschool through grade 12 district, the Charter School Institute or Board of Cooperative Educational Services (BOCES) which includes preschool through grade 12 grades within. Has its own principal who is not under the supervision of a principal of another public school, Has a budget separate from any other public school, Provides a complete instructional program that allows students to proceed to the next grade level or if a high school with twelfth grade, to graduate students. Public school- charter. Colorado public school definition and operates via a contract with an authorizer such as the local school district or, in some cases, the Colorado Charter School Institute. Public school- alternative campus. Colorado public school definition and serves one of the following

student populations: All students have severe limitations that preclude appropriate administration of state assessments, all student attend only on a part-time basis and come from other public schools where the part-time students are counted in the enrollment of the other public school; or More than 95% of students have either an Individualized Education Program (IEP) and/or meet the definition of a high-risk student. Non-public school. Applies to private, parochial and independent schools which provide education to children of compulsory school age. Neither the State Board of Education nor any local board of education has jurisdiction over the internal affairs of any non-state independent or parochial school in Colorado. A non-public school is considered a private business.

Q3 The school type:
- ○ Public school- traditional (1)
- ○ Public school- charter (2)
- ○ Public school- alternative campus (3)
- ○ Non-public school- private, parochial or independent (4)

Definitions: Urban region. A region surrounding a city. Most inhabitants of urban areas have non-agricultural jobs. Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. Suburban region. Suburban areas are smaller urban areas that surround cities. Most suburbs are less densely populated than cities. They serve as the residential area for much of the city's work force. The suburbs are made up of mostly single-family homes, stores, and services. Rural region. A rural area is an open swath of land that has few homes or other buildings, and not very many people. A rural areas population density is very low. In a rural area, there are fewer people, and their homes and businesses are located far away from one another. Resort region. An area which encompasses all the activities which may be carried out in a rural environment and which attract visitors because of their traditional features and because they are different from their usual lifestyle. Visitors may interact various activities, such as horseback riding, sightseeing, fishing, hunting, mountaineering, agritourism, cultural tourism, wine tourism/travel, health tourism, skiing etc. Accommodation is provided in establishments which have been especially prepared to accommodate visitors.

Q4 The region in which the school is located is:
- ○ Urban (1)
- ○ Suburban (2)
- ○ Rural (3)
- ○ Resort (4)

Q43 Definitions: Socioeconomic status. A measure of an individual's or

family's economic position based on income11. Poverty indicator. A measure to translate the comparison of well being with the poverty line, indicator may be a measure for individuals, households, aggregate group or sub-groups. Poverty indicators may measure incidences, depth, severity.   Free-reduced lunch qualified. An application for the free and reduced lunch program or the family economic survey that qualifies students based on economic criterion at or below the federal poverty level. Free and reduced qualification can be used as an indicator of poverty incidence.

Q5 Which statement best describes the socioeconomic status of the student population at the school?
❍ Majority free-reduced lunch qualified (high poverty) (1)
❍ Majority DO NOT qualify for free-reduced lunch (low poverty) (2)
❍ Equal distribution of students that DO qualify and DO NOT qualify for free and reduced lunch (3)

Definitions: School demographic group. School descriptors of population characteristics. Minority group. A culturally, ethnically or racially distinct group that coexists with but is subordinate to a more dominant group. As the term is used in the social sciences, a subordinate position is the chief defining characteristic of a minority group. As such, minority status does not necessarily correlate to population. In some case one or more so-called minority groups may have population many times the size of the dominate group. Non-minority group. A culturally, ethnically or racially dominant group.

Q6 Which statement best describes the school demographic group of the student population at the school?
❍ Majority represent minority groups (1)
❍ Majority represent non-minority groups (2)
❍ Equal distribution of students from minority and non-minority groups (3)

Definitions: Ethnicity. Refers to shared cultural practices, perspectives, and distinctions that set apart one group of people from another. That is, ethnicity is a shared cultural heritage. The most common characteristics distinguishing various ethnic groups are ancestry, a sense of history, language, religion, and forms of dress. Ethnic differences are not inherited; they are learned. Latino. A person of Latin-American (Mexico, Central American, Caribbean or South American) origin living in the Untied States. Non-Latino. A person not of Latin-American origin living in the United States.

Q7 Which statement best describes the ethnicity of the student population at the school?
○ Majority Latino (1)
○ Majority Non-Latino (2)
○ Equal distribution of Latino and Non-Latino students (3)

Q8 Please approximate the percent of each ethnicity background for the student population at the school?
_____ Latino (1)
_____ non-Latino (2)

Definitions: Cardiopulmonary resuscitation (CPR). An emergency lifesaving procedure that is done when someone's breathing or heartbeat has stopped. CPR combines rescue breathing and chest compressions. Rescue breathing provides oxygen to the person's lungs. Chest compressions keep oxygen-rich blood flowing until the heartbeat and breathing can be restored. Permanent brain damage or death can occur within minutes if blood flow stops. Therefore, it is very important that blood flow and breathing be continued until trained medical help arrives. Training. Includes instruction, education, coaching or preparation in a covered topic.

Q9 Does the school offer CPR training for teachers?
○ Yes (1)
○ No (2)

Answer If Does the school or school district you represent offer Cardio-pulmonary resuscitation (CPR) training or education for teachers? Yes Is Selected
Q9a Is CPR training REQUIRED for staff?
○ Yes (1)
○ No (2)
○ Not sure (3)

Q10 Does the school offer CPR training for students?
○ Yes (1)
○ No (2)

Q10a Is CPR training REQUIRED for students?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Definitions: Automated external defibrillators (AED). A small computerized medical device that analyzes a person's heart rhythm. The AED is programmed to detect the type of heart rhythm that requires intervention. It includes simple instructions and automated voice directions. Used outside of the hospital setting, the AED gives an electrical shock called defibrillation to restart a person's heart, if needed. Using an AED within the first few minutes of SCA can reverse cardiac arrest and saves lives.

Q11 Does the school have an AED available on-site?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Q11a Does the school offer AED deployment training?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Q12 Is CPR training required for teachers in written policy?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Q13 Is CPR training required for students in written policy?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Q14 Is availability of an AED on-site in written policy?
◯ Yes (1)
◯ No (2)
◯ Not sure (3)

Q15 As an educational leader, which statement do you feel best describes the purpose of schools?

○ A school's primary purpose is to support student's individual achievement and growth in academic skills: reading, writing, arithmetic. (1)

○ A school's primary purpose is to support the development of the whole child including equal attention to: social, emotional, academic and civic skills. (2)

Please provide any additional comments or questions:

APPENDIX E

SURVEY RESPONSES ADDITIONAL COMMENTS

Survey Response- Additional Comments

While our school specifically does not offer CPR training to staff, it is available for every employee through the District's staff development classes.   We offer a very introductory training to our 5th graders.   Thank you

While CPR training is available but not required for teachers, it is required for coaches. CPR training is not made available to the entire student population, however, it is provided for those students who work in our athletic training dept.

We would love to have an AED in the buildings but finances negate the possibility.

We would love having more people trained in CPR. It is required for certain positions, but not for everyone. The price of AEDs seems to be what keeps them from being in schools. Our MS and HS have them near their gym.

We use to offer CPR for the students, but due to the lack of interest we no longer offer it.

We require all staff to have a current first aid card, CPR training and the use of the AED. We provide the training.

We require a certain number of staff members to be CPR trained and provide them that training. We then offer classes to other staff members and they can choose to become certified and pay for it themselves. Some students who are taking a life-guard class do become CPR certified.

We lease space and so have negotiated AED placement and training with the landlord.

We have a team of staff members who have already obtained their First Aid Training who have signed up to be on the AED team. In addition, our health aide and front staff office members are required to be trained in first aid. We have one student of the 400+ who has been identified with a heart condition and therefore have an AED machine on site.

We have 5-8 teachers that are CPR certified and 5 employees trained to use the AED that is in the building.

We do require and complete CPR/First Aid and AED training for all of our early childhood educators and this is provided through NEBOCES or ECCLPS.

Training for AED was provided when it was donated. Our PK staff are required to have CPR training, and it is offered at our local JuCo.

The prior question is difficult. Our primary purpose is education, but we equally value the development of the whole child.

The last question was difficult to answer as we seek both. I think it is a poor question and would have preferred not to answer it.

The district requires front office staff and 2 additional staff members to be trained on CPR and AED. The district provides the training.

The district provides CPR and AED training. It was mandatory for 3 people from each building to attend. It is not mandatory for teachers per se or students.

Our teachers have the opportunity to take CPR and AED training through the district. It is required for our health room/office staff and playground staff. We have at least ten staff members that are trained in CPR and AED.

Our staff is required to take first aide every 3 years and with that training they take CPR. So CPR is only required every three years by the district even though

Our school has recently been provided with a AED. Our health aid and office staff have been trained to use this device, but not the teaching staff.

Our district has three buildings, in each building there is one AED per building. Our coaches are required to have first aid and cpr. Our district also works with the Pikes Peak Board of Cooperative Services for a School Nurse who does the training for the AEDs.

n/a

My school is an early childhood center with preschool teachers and staff required to hold current CPR and first aid certificates for childcare licensing purposes.

I wish I had enough time in the day/school year to devote equal time to the development of health ., wellness, social and emotional development of all my students. My primary goal is academic growth and for some students that means we have to pay attention to their social and emotional well being. IF every school had a full time counselor we could address more of these needs, but we don't have the time or human resources.

It takes a family to raise a child. It takes a village to support the family. The school exists to be part of that village. The biggest problem in education today is the breakdown of the family.

I requested an AED- was denied because of cost and that we are an elementary building. I looked into CPR training for the student council and the cost was prohibitive.

If principal's are having a higher rate of cardiac arrest, it is because the job is too stressful. With multiple initiatives from the state, administrators are spread too thin, work long hours, and give up healthy habits by staying late, going in early, etc. The stress we are under will kill us before anything else we choose or not choose to do. How can we obtain equipment and trainings? .

Good survey, but I could easily argue that cardiac arrest is not the leading cause of death in the US. Example, if you are gathering your data from death certificates signed by coroners w/o an autopsy performed you will find a high percentage indicating a cardiac event because ultimately the heart does stop, but it wasn't proven that was the cause. In your opening statement referencing the four student athletes one was stated to have a degenerative heart issue, was the death caused by the degenerative heart issue or cardiac arrest, and how was (if it was) proven to be the cause? I must note that I am a huge proponent of having AED's on site and I believe that they will save lives, but I also believe the national data is skewed and/or reported/interpreted incorrectly.

Good luck with your research Leigh!!

Each school secretary who is delegated to by the school nurse when she is not in the school is certified in CPR/First aid. It is a requirement of their job description, along with any coaches.   Students at the HS level take CPR/First aid as part of their health class, but I am not sure if they get certified. So in this respect, it is required for the class for those students, but not in policy.   This year, the basics of Hands Only CPR program through the American Heart Association was reviewed with the 4th and 6th graders during their annual health screening at the school. They were also able to practice on mannequins with instructor support. This was not a requirement, but a focus for the school nurse on heart health and what to do in an emergency.   AED's are in each building and supplied and checked by our local EMS agency.

Due to known health conditions of multiple students, we are finalizing the purchase an installation of an AED thanks to collaboration with Children's Hospital in Denver. We believe it is critical to have this device on site in the event of an emergency. Also, starting this fall, there will need to be a teacher certified in CPR/First Aid on all excursions. We do have an emergency response team where all members (8 to 10) are current in the CPR/First Aid certification. Good luck to you.

CPR training is required for some staff: all front office staff, nurse aides, principal, & coaches.

CPR is required for staff who work with students with significant needs. Our office

staff, health aid and preschool staff are also required to have CPR training.

CPR first aid training is required for staff who work in special needs programs. It is not required of all.

Cost prohibits safety...far too often.

Being a Catholic school, we form the whole child in academics, our faith, and how to use that faith to become a well educated and formed citizen

As the principal I am looking to add First Aid/CPR training to our curriculum next year. For now it will be a one day training. In the previous school I worked in we had 9 weeks of First Aid/CPR training that was required to all incoming freshman.

Although we do not require all staff to be CPR certified, in each of our buildings we have several individuals who are certified. Required by the state athletic association, all district coaches are CPR and AED certified. Each of our buildings have AED's and our coaches are equipped with portable AED devices. The staff are trained each year on AED use and application.

All of our athletic coaches are CPR and AED certified.

All athletic coaches in our school are required to complete CPR training.

AED training is done through our local volunteer Fire Department. CPR is also available to students through the VFD.