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Evaluation of Seizure Recognition and First Aid Training Course and Improving Self-Efficacy Related to Medical Emergencies in Mississippi

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By

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Approved by

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DEDICATION

This thesis is dedicated to Logan, we love you and support your desire to shed light on epilepsy.

Also, to a better and healthier Mississippi, let this be a love letter to Mississippians everywhere

ACKNOWLEDGMENTS

Special thanks to Dr. Anne Cafer for overseeing the process of creating this project and implementing training as well as constructing this work of literature. Without her knowledge and expertise, this endeavor would not have been possible. Additionally, we would like to extend our gratitude to the Sally McDonnell Barksdale Honors College.

Furthermore, we would like to pay special tribute to the National Epilepsy Foundation for creating this program and allowing us to share it with populations in Northern Mississippi.

ABSTRACT

Within recent years, there has been increased attention to the growing physician shortage across the United States. This shortage has placed substantial strain upon regions of lower healthcare access, particularly those of rural regions such as much of the state of Mississippi. As rural healthcare providers are placed under more strenuous conditions, they encounter issues of increased patient volume, lack of a trauma team, or adequate transportation to higher-level care facilities. These issues may exacerbate the present inequities in cost of living, access to adequate healthcare, and the distress caused by these concerns. Individuals with epilepsy are one cohort with an established increased likelihood of injury and cost of living. To counter the effects of the changing healthcare environment, the National Epilepsy Foundation created the Seizure First Aid course to provide those outside of the healthcare field with the knowledge to assist in seizure-related emergency situations.

In the course of this project, we received certification through the National Epilepsy Foundation's Seizure first aid course and provided this training to several groups throughout the Northern Mississippi area. The training consisted of various exercises depicting seizures and epilepsy, explanations about what happens during a seizure and what to look for, and instructions on how to provide first-aid should one encounter an emergency scenario. Prior to training, a pre-course survey collected biographical information, current perceived self-efficacy in various metrics of the course, and subjective measurement of prior knowledge. Following the conclusion of the course, a similar survey was administered to assess the impact of the course on participants' willingness to intervene and proper understanding of the first-aid protocols.

Organization and descriptive analysis of the 38 completed data points collected across the three trainings indicated that the course was successful in adequately conveying the necessary information for assisting in seizure emergencies. Prior to completion of the course, the average participant did not meet the required level of understanding to achieve certification through the National Epilepsy Foundation; however, the post- survey found that the average participant met the required level of knowledge to gain certification. Participants also displayed improved subjective efficacy of ability and willingness to intervene for every measured metric. Lastly, participants rated the course as incredibly useful, and every participant selected that they would highly recommend this course to others.

The National Epilepsy Foundation's Seizure First Aid training was proven to be effective in its goals of increasing audience member's confidence in implementing first aid techniques as well as their knowledge of epilepsy and seizures. Hospitalizations and injuries as the result of seizures can be reduced using seizure first aid techniques. By reducing the total hospitalizations, medical costs related to epilepsy treatment would also be reduced. If this training is incorporated into programming related to rural and preventative healthcare, there would likely be a reduction in overall injuries and hospitalizations related to seizure events. In a medically underserved and largely rural state like Mississippi, reducing strain on the healthcare system is vital to increasing health outcomes for all, especially when considering the added strain from Mississippi's physician shortage.

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INTRODUCTION

Background

There are growing concerns across the United States regarding the rapidly increasing physician shortage and its impacts on healthcare access. As this trend continues to place more strain on the current healthcare system, pre-existing healthcare inequities, particularly in rural communities, are likely to be increasingly exacerbated. The state of Mississippi contains substantial amounts of rural communities with a level of medical care that is frequently rated last among all fifty states. In these rural communities, there is often a lack of emergency medical services resulting in many patients being unable to access the care that they need promptly (Williams et. al, 2001). Causing patients to experience unnecessary pain, hassle, and financial distress.

One of the many groups of individuals who are particularly affected by this disparity in the level of emergency healthcare access are patients who suffer from epilepsy. People who live with epilepsy frequently require more emergency medical services and are therefore more likely to be affected by living in a medically underserved community (Tellez-Zenteno and Nguyen, 2009). In an attempt to fill this void, the National Epilepsy Foundation created a program sponsored by the Center for Disease Control to assist in the training of epilepsy first aid for the American public.

Epilepsy is a neurological condition where an individual has unprovoked recurrent seizures. Some patients can identify their seizure triggers with the help of a healthcare team, but others are unable to find the cause of their seizures. Additionally, a seizure can occur in any

environment, leading to injuries of varying severity. Generalized tonic-clonic seizures, atonic seizures, and complex partial seizures are the types of seizures that are associated with a higher risk of injury. During the event of a seizure, it is common for the individual to fall due to loss of muscle control. 45.2 % of seizures result in an individual falling, which can result in fractures, soft tissue injuries, concussions, burns, and other less common injuries (Nei and Bagla, 2007). Fractures are obtained through a loss of protective reflexes during a seizure, causing the individual to take the full force of a fall instead of catching themselves on their forearms or legs. Landing with full body weight on areas like the wrist or shoulder can cause fractures or dislocation that will require further medical attention. Soft tissue injuries happen during a seizure when an individual falls on a rough or uneven surface. Even softer impact areas such as carpet can cause deep abrasions in the soft tissue due to the high force of impact when falling, and the additional friction as the result of repeated convulsions. Furthermore, erratic and strong convulsions can cause an individual to hit things in their environment, causing more injuries. Seizures can occur at any time, including while an individual is cooking; if one were to occur in this scenario, the seizure may result in severe burns. Concussions may also occur as the result of a seizure if an individual falls and hits their head aggressively on the ground. Additionally, concussions may also occur when an individual is having a seizure if their head is not secured properly as they can collide repeatedly with objects in their environment as they convulse. However, the majority of these injuries are preventable if bystanders are well versed in proper seizure first aid.

Because of the increased risk of injury to those with a seizure, they are also much more likely to be hospitalized. Annually 93,000 hospitalizations can be linked directly to epileptic concerns (Tellez-Zenteno and Nguyen, 2009). Falls that would leave a healthy individual with

surface-level scrapes can become much more deadly during the event of a seizure. Individuals with epilepsy do not often die from a seizure itself, but rather due to injuries obtained across the duration of the seizure. Educating the public on how to react in the event of a seizure, will decrease the number of annual hospitalizations, helping decrease the overwhelming number of patients admitted to emergency rooms. The majority of injuries received as the result of a seizure were minor and preventable; however, epileptic individuals continue to have increased rates of hospitalizations. Often hospitalization is due to a lack of education on what to do following the events of a seizure or a failure to evaluate the injuries that were obtained. Contrary to popular belief, emergency medical services are not always necessary following the events of a seizure. Unless a seizure lasts three minutes or longer, further neurological evaluation is often not needed. However, if an individual falls and breaks a bone or obtains any other severe injury, emergency medical services will need to be utilized. Furthermore, individuals with epilepsy had the same risk of soft tissue injury as healthy people when injuries that occurred due to a seizure were removed from the data set (Wirrell, 2006). If the number of falls due to seizures were reduced, the potential to reduce hospitalizations for epileptic individuals is likely. By learning what to do in the event of a seizure, the injury and hospitalization rates of epileptic individuals will be greatly reduced due to decreased incidences of preventable injuries.

Epilepsy can cause someone to seize at varying times and in a wide array of environmental settings. Since the occurrence of secondary accidents due to seizures is considerable, the rate of hospitalization for a person with epilepsy is higher than for a person without it. Thus, people with epilepsy experience a significant financial burden due to continual trips to the emergency room. In Mississippi, about 47% of households fall below the Federal Income Poverty Level and have a necessity for government assistance insurance programs

(Crudden et. al, 2009). This puts more pressure on public hospitals to accommodate and care for these individuals, creating a cost containment issue that has led to increased expenses for emergency healthcare settings. Those who are constantly being admitted into these facilities face a continual financial challenge for paying for this care, but those in rural areas face an additional challenge. Many rural areas are heavily impacted by the growing physician shortage and are facing insecurities regarding healthcare. Obtaining access to care has been an increasingly severe struggle in rural areas, and the commonly prioritized manner of care in rural areas is not always emergency-based. Emphasis is frequently being placed on primary care rather than emergency care, causing those who seek emergency care to endure greater expenses to find and travel to these emergency facilities. Furthermore, rural physicians often have an increased patient volume, a lack of a trauma team, and rarely have stand-by EMS services for transferring patients to higher-level facilities (Williams et. al, 2001). With an influx of patients and a lack of appropriate care for emergency victims, rural physicians have to provide a quick assessment of the patient, patient stabilization, and patient transfer via EMS.

For individuals with epilepsy, the average annual cost for post-seizure emergency room visits is $9,617 but can range between $4,200 - $138,000 (Yoon et. al, 2009). This wide range also accounts for accessory fees that are not directly related to hospitalization. Because many of the economic studies that centered around people with epilepsy were performed in urban areas, there is no account for people with epilepsy residing in rural areas who do not have appropriate access to the same emergency care. Studies also have shown that on average, people with epilepsy rely more on public insurance programs and government assistance than people without epilepsy do. They are also less likely to be privately insured and have poor health statuses compared to people without epilepsy. Due to this and the cost containment issues of emergency

settings, people with epilepsy have higher medical expenditures and higher healthcare cost-related discrepancies compared to those without epilepsy.

Project Context

This program was vitally important to each of us as we have very close ties to someone who is afflicted with epilepsy. In June of 2021, he suffered a grand mal seizure in the Jackson International Airport. During the seizure, no one in the airport including bystanders and staff knew what to do in the face of the emergency. As a result, he ended up gaining substantial facial injuries that required paramedics and emergency treatment. While he ended up making a full recovery, the paramedics made it clear that if he had landed any differently, he may have suffered grave injuries or even death. If any of the bystanders had known what to do in the event of the seizure, his injuries and the risk to his life could have been avoided entirely. Events like this with our close friend inspired us to take the National Epilepsy Foundation's Seizure First Aid course so that we could personally recognize an impending seizure and assist him by completing their online Seizure First Aid (SFA) training. This training directly aligns with the National Epilepsy Foundation's mission to "improve the lives of people affected by epilepsy through education, advocacy, research, and connection" since its establishment in 1968 (Sirven et al.). The National Epilepsy Foundation has educational information about epilepsy and seizures readily available on their website as well as training programs that discuss in greater detail how to respond in the event of a seizure, such as the SFA training. They have several other projects including educational materials about SUDEP (Sudden Unexpected Death in Epilepsy), advocacy programs for individuals with epilepsy, and camps for children with epilepsy. Additionally, the National Epilepsy Foundation robustly supports research efforts regarding clinical treatments in

epilepsy. Specifically, over the past 11 years, the National Epilepsy Foundation has funded nearly half of the clinical epilepsy therapies currently in the clinical research pipeline. On their website, many initiatives are listed, including a Research Roundtable for Epilepsy (RRE) and the Epilepsy Pipeline Conference as a way to get scientists researching epilepsy and its treatments in touch with each other. Additionally, they have created a Shark Tank-inspired competition where researchers pitch their research project, and the winner is awarded a monetary prize to support the development and commercialization of new technology or treatments in the field of epilepsy. The National Epilepsy Foundation strives to achieve the best outcome and highest quality of life for all individuals with epilepsy, which requires a system with four components; "high-quality medical care, accessible community services, supportive environments in which to live, learn, work, and play, and an activated individual and family" (Sirven et al.). After realizing the direct implications of the physician shortage in Mississippi and the lack of emergency medical services available in rural areas, we realized we could support the National Epilepsy Foundation in their mission to equip community members with education related to epilepsy therefore reducing the stress on a strained healthcare system and improving seizure outcomes for individuals with epilepsy. After taking additional training through the National Epilepsy Foundation, group members were adequately educated on how to administer the SFA training information. With the assistance of Dr. Anne Cafer, we have implemented this course throughout Northeast Mississippi to raise awareness of epilepsy among three cohorts of participants. These cohorts include the Tupelo Public School District, the American Medical Student Association, and the American Medical Women's Association. Additionally, the course emphasized the importance of prompt care for those who have recently suffered from a seizure. As many rural regions lack the infrastructure for the delivery of this care, we sought to provide this epilepsy first aid training to

several groups across northern Mississippi to assess the efficacy and value of this training and others like it.

Purpose

The purpose of our project is to provide areas that may encounter a higher likelihood of epileptic encounters with a tool to assist in times of emergencies. The National Epilepsy Foundation's Seizure First Aid course provides these targets with key interventions of what to do when someone is seizing. In order to earn a certificate in proficient knowledge of seizure first aid, individuals must learn how to recognize seizures, understand their origins, and learn how to intervene in the event of a seizure. The key elements of the seizure first aid protocol are to stay with the seizing individual until the completion of the seizure, assist them to a safe environment where there are no hazards present that can harm them during their seizure, and timing the seizure to know when or if emergency medical services are needed. Because most secondary complications arise while seizing, securing a safe environment is such an important step in providing successful seizure first aid. Many secondary injuries that arise in epileptic people are preventable, and if these steps are followed correctly, the risk of injury is drastically reduced. Proper implementation of seizure first aid can lead to fewer visits to emergency healthcare settings, which will in turn reduce the financial burden present to those with epilepsy. These safety sessions can also be targeted to rural areas to provide access to these preventative procedures so that those with epilepsy will not have to travel large distances to get the emergency care they need, as well as to provide more of the rural population with tools to aid in seizure crises before the need for emergency care is raised.

PROJECT ACTIVITIES

Overview:

Table 1: Overview of Project Activities

Task	Progress
Goal 1: Become Certified as Seizure First Aid Course Instructors	
Task 1: Complete the National Epilepsy Foundation's Seizure First Aid and Safety Training Course	This task was completed with minimal difficulty by all group members
Task 2: Become certified as a Course Instructor for the Seizure First Aid Training Course	This task was completed by Anna Katherine so that as a group the training course could be presented.
Task 3: Meet with Cheryl Houston from the National Epilepsy Foundation to finalize Instructor Status	This task was completed with minimal difficulty and was vital to ensuring the validity of the provided training sessions.
Goal 2: Create an Ethical and Informative Survey	
Task 1: Create Survey using Qualtrics	This task was completed using several components which consisted of a demographic section, a confidence assessment, and a knowledge assessment that was to be completed both before and after the training.
Task 2: File for IRB Exemption	This task was completed in order to assure the survey was ethical for all participants. After one round of edits, the survey was given IRB exemption.
Goal 3: Seizure First Aid Training at Parkway Elementary School in Tupelo, MS	
Task 1: Establish a Date for Training	Collin Crawson initiated contact with Parkway Elementary School and set up a

	training on 10/13/23
Task 2: Practice Training	This task was completed by all group members in order to assure equal effort amongst group members. Additionally it helped assure that the information communicated in the training was accurate.
Task 3: Deliver Training	This task was completed by all group members. Pre and post surveys were collected as a part of this training.
Task 4: Post-Training Follow-up	Collin Crawson communicated with Parkway Elementary School administration to ensure that the audience members had the necessary materials to earn a certificate from the National Epilepsy Foundation.
Goal 4: Seizure First Aid Training with the American Medical Student Association (AMSA)	
Task 1: Establish a Date for Training	Daniel Zuckerman initiated contact with the American Medical Student Association at the University of Mississippi and set up a training on 2/8/24.
Task 2: Practice Training	This task was completed by all group members in order to assure equal effort amongst group members. Additionally it helped assure that the information communicated in the training was accurate.
Task 3: Deliver Training	This task was completed by all group members. Pre and post surveys were collected as a part of this training.
Task 4: Post-training Follow-up	Daniel Zuckerman communicated with AMSA executive board members to ensure that the audience members had the necessary materials to earn a certificate from the National Epilepsy Foundation.
Goal 5: Seizure First Aid Training with the American Medical Women's Association (AMWA)	

Task 1: Establish a Date for Training	Anna Katherine Herrington initiated contact with the American Medical Women's Association at the University of Mississippi and set up a training on 2/21/24.
Task 2: Practice Training	This task was completed by all group members in order to assure equal effort amongst group members. Additionally it helped assure that the information communicated in the training was accurate.
Task 3: Deliver Training	This task was completed by all group members. Pre and post surveys were collected as a part of this training.
Task 4: Post-Training Follow-up	Anna Katherine Herrington communicated with AMWA executive board members to ensure that the audience members had the necessary materials to earn a certificate from the National Epilepsy Foundation.
Goal 6: Data Analysis	
Task 1: Group Pre and Post Surveys by user	This task was completed by all group members. Grouping pre and post surveys was made more difficult by a lack of matching samples. Samples were matched via IP address, however all audience members did not complete a pre or post test, leaving several unusable data points. Additionally, not all of the pre and post tests were fully completed, resulting in more unusable data points and a reduced sample size.
Task 2: Analyze Demographic Section	This task was completed by all group members with minimal difficulty.
Task 3: Analyze Confidence Assessment	This task was completed by all group members with minimal difficulty. Pre and Post confidence levels were scored and averaged in order to gauge an overall level of confidence across all training sessions.

Task 4: Analyze Knowledge Assessment	This task was completed by all group members. While time consuming, this task was necessary to gauge the ability of the Seizure First Aid Training in effectively communicating information. Each question was manually scored and the average of pre and post correctness was taken.
Task 5: Organize Data	This task was completed by all group members with minimal difficulty. The findings from the data analysis were cleaned and put into tables for the reader's convenience.

Training

The Seizure First Aid Training that was administered consisted of four sections detailed below. A powerpoint presentation was presented along with a spoken dialogue to emphasize important details related to the information on the slides. Some of the powerpoint slides included video components that were also played to increase the audience's understanding of the information. Engagement with the different audience sections was determined based on several factors including the convenience of obtaining permission to complete the training, the willingness of audience members to participate, and applicable future research areas that each group could assist with. For the first training session, it was designed to be given to a cohort of elementary school teachers and administrators. This group training was convenient to establish because one of the group members has connections with Parkway Elementary School and its principal, Ms. Carmen Gary. This group was also chosen based on the evidence that epilepsy is extremely prevalent in children, so that the participants who received this training could have firsthand experience if they encounter emergency situations with a student. The second training session was conducted with the American Medical Students Association at the University of Mississippi. This group was selected for training for several reasons. Firstly, organizing a time and location was incredibly convenient due to their regularly scheduled meetings. Furthermore, the group provided a very attentive audience with all participants already having an established interest in healthcare. Lastly, one of our project members participates on the executive board of AMSA as Sergeant-At-Arms, allowing easy allocation of time for the project in the student organization's schedule. The third training session was conducted with the American Medical Women's Association at the University of Mississippi. This group was very receptive to conducting training, but it is worth noting that one of our project members is on the executive

board of AMWA as the programming director. Consequently, they were suggesting meeting topics to be approved by the president, providing a convenient avenue to suggest the SFA training as a part of the organization's programming. Additionally, since the members are interested in pursuing professions in the healthcare field, they were invested in the educational benefits offered by SFA training.

Table 2: Summary of Seizure First Aid Training Modules

Section 1: Why Seizure First Aid
In this section, participants learned about how common seizures are, common myths related to seizures, and risks pertaining to seizures.
Section 2: Seizures and Epilepsy
In this section, participants learned about the many factors that can trigger a seizure as well as treatments for seizures. Additionally challenges related to seizures and epilepsy are discussed.
Section 3: Seizure Recognition
In this section, participants learn about the different types of seizures as well as how to recognize them.
Section 4: First Aid
In this section, participants learn correct and incorrect steps to helping someone who is having a seizure. Additionally participants are advised on when it is necessary to dial 911 for further medical assistance.

OUTCOMES

Progress and Achievements

In order to assess the efficacy of the National Epilepsy Foundation's Seizure First Aid and Safety training, a survey was given before and after the training to gauge improvements in self-efficacy related to seizure first aid and general knowledge surrounding seizures. Demographic information was also collected to provide a framework for the data that was collected. In addition to standard demographic information, participants were asked if they had epilepsy or if they knew an individual with epilepsy. The self-efficacy portion of the questionnaire consisted of a series of questions scored on a scale of 1-5 (5 being high and 1 being low). Topics included confidence in the ability to recognize, assist, and implement first aid strategies in the event of a seizure as well as their likelihood of recommending the training to others. The last portion of the questionnaire consisted of a series of five multiple-choice questions drawn randomly from a pool of ten questions. The purpose of this section was to gauge the ability of the training to build upon the knowledge of participants and the participant's retention of new information related to seizure first aid. A total of 38 completed sets of questionnaires were collected throughout three training sessions. Our first training session was conducted at a public elementary school in Tupelo, MS as a professional development exercise for educators at that school. The second training was presented at the University of Mississippi to a group of students interested in pursuing a career in the medical field with the permission of the American Medical Student Association (AMSA). Our last training was conducted at the

University of Mississippi with a group of students interested in health-centered careers with the permission of the American Medical Women's Association (AMWA).

Table 3: Objective Analysis of Surveyed Data

	Before Training	After Training
Total Number of Questions	190	190
Number of Correct Responses	118	152
Correct Responses %	62.11%	80%
Median Correct Responses (Out of 5)	3	4
Standard Deviation	1.173	0.716

Table 1 shows an analysis of the multiple choice segment of the questionnaire in which we see a 17.89% increase in correct responses in the questionnaires completed following the training compared to the questionnaire completed prior to the training. Overall, the average number of questions correct resonances after the training was 4 out of 5 questions. In order to receive a certificate in seizure first aid through the National Epilepsy Foundation, you have to complete a five question multiple choice question assessment and receive a score of 4 or higher. Before the training, on average, our participants would not have been able to score into the proficient knowledge group, however after the administration of the seizure first aid training course, the participants would have a proficient level of knowledge to earn a certificate in seizure first aid. By increasing the average score into a proficient range, the training proves to accomplish its main goal: the certification of individuals in seizure first aid.

Table 4: Data Relationships from Table 1 Results

% of an Increased Response	55.26%
% of an Increased Response of 2 or More	23.68%
% of Participants Who Know Someone With Epilepsy	50%

Not only were individuals scoring into a proficient level overall, but over half (55.26) increased the number of correct responses after the training was administered. Not only this, but 23.68% of participants increased the number of correct responses by two or more (Table 2). In addition to the increased knowledge of individuals in the topics related to the recognition of seizures, the origins of seizures, and the proper routes of intervention in the event of a seizure, the program also improved discernment of information related to seizures. By proving that over half of participants are able to build upon their prior knowledge of seizure first aid, we can see that this training created by the National Epilepsy Foundation is capable of helping the majority of participants retain and apply information related to seizure first aid in a more effective manner. Half of these participants may have had an increased reason to learn and apply effective seizure first aid strategies as 50% of the participants knew someone with epilepsy or recurring seizures (Table 2).

Table 5: Subjective Analysis of Surveyed Data

Average Rating of Course's Conveyance of Info (1-5)	4.842
Average Rating of Course's Usefulness (1-5)	4.816
Average Pre-Course Confidence in Administering First Aid (1-5)	3.237
Average Post-Course Confidence in Administering First Aid (1-5)	4.921
Average Pre-Course Confidence in Assisting In Event of Seizure (1-5)	3.211
Average Post-Course Confidence in Assisting In Event of Seizure (1-5)	4.763
Average Pre-Course Confidence in Recognizing a Seizure (1-5)	3.553
Average Post-Course Confidence in Recognizing a Seizure (1-5)	4.658
Recommendation of Course (1-5)	5

The self-efficacy portion of the questionnaire showed an overall increase in each category. The course was given an average score of 4.8 by the 38 participants on its ability to convey information related to seizures in a way that is easily retained and engaging. While the training's media portions are slightly dated, they are very informative and help keep participants' attention between sections of dialogue. Without the breaks provided by the videos embedded into the powerpoint, the speaker's dialogue would appear monotonous and the participants' attention would drop. The course was given an overall usefulness rating of 4.8, and could allude to the inclusion of information that is unnecessary to some groups of participants. While every slide might not apply directly to the participants' current situation, the majority of information presented in the seizure first aid training was deemed applicable to everyday life. Overall confidence in the ability to administer seizure first aid jumped from 3.2 before the training was administered to 4.9 after the training was administered. Additionally, overall confidence in the ability of individuals to take action and intervene in the event of a seizure increased from 3.2

before the training was administered to 4.7 after the training was administered. The positive trend for this marker of self efficacy might be diminished by the acknowledgement that some individuals might be uncomfortable intervening in the event of a seizure regardless of their level of practical knowledge, and feel safer calling medical professionals. As the overall goal of the training is to certify individuals in seizure first aid and improve knowledge of how to intervene in the event of a seizure, the strong positive trend in confidence to administer seizure first aid provides evidence that this goal is being achieved. Individual's ability to recognize a seizure increased from 3.5 before the training was administered to 4.6 after the training was administered. The first step to intervening in the event of a seizure is by properly gauging if a seizure is occuring. The final goal of the seizure first aid training was fulfilled in its ability to increase an individual's ability to recognize potential seizures. Not only did the National Epilepsy Foundation achieve its three three goals as gauged by the self efficacy of participants, but all 38 participants said they were extremely likely to recommend this training to others with an overall score of 5. While no interactive training medium is perfect, the National Epilepsy Foundation's Seizure First Aid and Safety course achieves its three goals of increasing the recognition of seizures, the ability to assist in the event of a seizure, and the ability to administer seizure first aid and is simultaneously engaging and entertaining to participants, making it more likely that they would recommend that others receive the training as well.

REFLECTIONS

Collin:

I chose this project to provide my community with a better understanding of a disorder that affects one of my dear friends. Before I knew him, epilepsy was an unfamiliar topic to me but once I was exposed I noticed it more than ever in my surrounding environment. Epilepsy is a disorder that affects an immense number of people around the world and yet it is not commonly mentioned in basic first aid training. Taking on this project allowed me to take action and bring others to understand and value the medical diagnoses that would become very close to me. Another one of my passions is assisting underserved rural communities, and this project provided me with the opportunity to take my certification in recognizing types of seizures and implementing first aid procedures in areas that could potentially be further away from medical care. One aspect of seizure first aid is to act quickly and not waste time during the onset of a seizure emergency, and implementing this course in rural areas could potentially save the lives of seizing individuals in these areas who do not have the same access to care as in urban areas. This project proved to be rewarding in both my personal and professional endeavors and has made me proud to take on this experience.

I chose to do my project training at Parkway Elementary School, located in Tupelo, MS. Another key feature of epilepsy is that it is diagnosed primarily in young children and adults over the age of 65. Since children are at a higher risk of developing epilepsy, I thought it would be a worthwhile endeavor to present our project to a group of elementary school teachers who could implement seizure first aid training in the case of a seizure emergency happening in their

classroom. If teachers can implement these techniques quicker than medical professionals can arrive at the scene, it saves precious time that is available for a seizure to wreak havoc on the developing nervous system of the child. Results taken at this training session proved that our project training was beneficial and increased the self-efficacy of the teachers in implementing these first aid procedures.

If this project could be completed by others in the future, my recommendation would be to take the time to walk through the certification process of the course with the participants. We provided the option for participants to take the online certification course but were unaware of how many participants would go on to receive the certification. The Epilepsy Foundation provides great tools for participants to test their knowledge and be awarded with their certificate as proof of competence in the material. Having the knowledge of what to do during a seizure emergency and implementing the strategies are different endeavors. I believe that if participants had a national certification in this area, their levels of efficacy would increase as well to provide first aid services to seizing individuals and potentially save their lives. I have gained valuable experience throughout this project that I will continue to grow and use to expand epilepsy awareness in communities around me.

Daniel:

Throughout my time at the University of Mississippi, I participated heavily in organizations such as the American Cancer Society that emphasized the importance of providing members of the community with medical knowledge. Thus, when I was granted the opportunity to work on a project that fulfilled this passion of mine, I knew that it was a natural progression from the work that I had previously completed. Additionally, during my sophomore year, I

became good friends with Anna-Katherine and her husband who has had epilepsy for his entire life. I had seen the personal impacts that various forms of epilepsy can have on the individual and their concerns for their own safety in the event that one were to occur, but I also saw the fear that an unprepared loved one can face when their friend or family has a seizure. Each of these factors propelled me into this project and provided me with a personal connection to the work that we were actively engaged in on the University of Mississippi campus and surrounding areas.

Prior to administering the program to various groups of individuals, I was first required to take the course myself. This experience of taking the course showed me firsthand how valuable a first aid course such as this could be as I walked away from it feeling capable and confident in my ability to help my own friend if something ever were to happen. Throughout the course, one of the frequently reiterated concerns for those undergoing an active seizure is time. If the seizure lasts for too long, it is possible that permanent damage can occur. Therefore, it is crucial that a seizing individual receive prompt first aid. When setting out to provide this same program to others, I understood the importance of instilling this same level of confidence to ensure that more people are capable of providing rapid care. Throughout our time working on this project, I participated in the training for teachers at Parkway Elementary School and for members of the American Medical Women's Association in addition to organizing the training for members of the American Medical Student's Association. This training session proved to be very successful due to the active engagement of those participating and their previous knowledge of the brain. In organizing and helping to administer this and other sessions, I was able to put into practice my years presenting with the American Cancer Society in a new light. Rather than just providing education about what various diseases and disorders are, I feel that I was able to make a difference on a practical level where those in attendance can take what we are taught and use it to

make an impact in emergency situations. I learned that teaching first aid via this and similar programs can rapidly increase a community's confidence in these situations which may help take pressure off of emergency responders, particularly in regions that are medically underserved.

In the case that someone wishes to complete a similar project in the future, I would recommend that they experiment with easier ways of connecting the data from the pre and post-surveys and assist in the national certification process rather than sending the link out and asking every participant to complete it on their own time. During the data cleaning process, it was incredibly difficult to match up each pre and post-survey due to non-matching IP addresses, utilization of non-matching devices, or incomplete survey responses. These issues all factored into the loss of several points of data that would have helped increase our sample size. Additionally, we did not have enough time for each presentation for the completion of the national certification through the National Epilepsy Foundation. If we had been able to allot more time to the training sessions, each participant would have been able to take away a tangible certificate of their experience in addition to their newfound knowledge. This may have increased engagement in some sessions. Nevertheless, I feel that this project was a rousing success due to its measured impacts on those who participated and the lessons that I personally learned from it.

Anna Katherine:

During my sophomore year at the University of Mississippi, my boyfriend of four years proposed to me, but he almost died just days before the proposal. At the Jackson International Airport, my husband, Logan, had a seizure that caused him to fall resulting in a concussion and a serious facial wound. No one in the airport, including myself, knew what to do to help him. My

husband is epileptic, but he hadn't had a seizure in the last seven years. I quickly went from dreaming about what color my bridesmaids would be wearing to wondering if Logan would be alive the next day. Shortly after I learned what to do if he ever had a seizure again by taking the National Epilepsy Foundation's Seizure First Aid course. Later that year, he had another seizure when we were alone, and without the training he would have been seriously injured. When I told my friends the story of Logan's seizures and how I worried about him when I wasn't with him, they took it upon themselves to take the Seizure First Aid Training course. I quickly realized how a training of this manner could make an impact in the safety of individuals who have recurrent seizures. I became certified to lead others in this training and dove into research concerning the number of preventable injuries that occurred during seizures. Education is a strong component in establishing self efficacy surrounding healthcare. Especially in a state that struggles with a physician shortage and contains a high proportion of rural areas, I wanted to see how leading trainings and educating members of the community to intervene in the event of a seizure could help reduce injuries, hospitalizations, and as a result medical bill costs related to seizures.

After each member of our group had the proper certifications, we began reaching out to see who would be interested in receiving training in seizure first aid. We lead trainings in Parkway Elementary School, the American Medical Student's Association at the University of Mississippi, and the American Medical Women's Association at the University of Mississippi. While I have held leadership positions in several different organizations on campus, leading these sessions presented a different perspective to communication. I wasn't just communicating upcoming announcements and events, I was relaying information that if presented well could help impact a vulnerable population in the surrounding community. The majority of the participants were engaged throughout the session, and the materials provided by the National

Epilepsy Foundation made it easy to communicate the necessary information to the audience. Being able to educate others on a topic that is so important to me reinforced the impact that practical health applications can have on a community regardless of prior healthcare experience. All three of our audiences were composed of individuals that are not healthcare professionals, even if their goal is to one day be. However, after receiving the training, our audience's confidence in administering seizure first aid techniques and likelihood of assisting in the event of a seizure rose to 4.9 and 4.7 respectively (on a 5 point scale). Programming and education are vital to making an impact in the safety of individuals with recurrent seizures and helping reduce the effects of the physician shortage in Mississippi.

In the future, others who attempt a project of this type should expect some difficulty in collecting survey data. Since this type of data analysis relies on audience members completing a pre and post assessment, we found ourselves with several unusable data points that were missing a pair or were incomplete. Additionally, since data is collected anonymously, it was difficult to match data points if the IP addresses of the answers were not equal. Some audience members would fill out one survey on their smartphone, and another on their computer, which presented additional obstacles to matching data points. The National Epilepsy Foundation has created a helpful and practical program to help educate individuals on what to do in the event of a seizure, but the materials needed to present the training can be difficult to find. After I gained the ability to lead Seizure First Aid sessions, I struggled to find the presentations and scripts I needed in order to present the proper information. If the information is presented improperly, it could have serious consequences, so it might be worth investigating a more user-friendly format in which instructor materials are stored. Additionally, it was difficult to direct the audience in how to actually receive their certificate in seizure first aid from the National Epilepsy Foundation.

Receiving this certificate was a huge incentive for many people to complete this training, and was a source of frustration both for us as instructors and the audience members. However, the overall training experience is helpful, educational, and serves the purpose that it intends. By using this training and similar training I believe that areas that are experiencing a physician shortage can help reduce the strain on emergency medical services by increasing self efficacy related to healthcare emergencies as well as creating a safer and more inclusive community for those who live with recurrent seizures.

CONCLUSIONS

The National Epilepsy Foundation's Seizure First Aid and Safety educational training is effective in increasing audience members' confidence in administering seizure first aid as well as their knowledge of epilepsy and seizures. Based on the aforementioned research, the majority of injuries related to seizure events are preventable. This is especially of consequence in medically underserved areas, like the state of Mississippi. By utilizing educational courses such as the one provided by the National Epilepsy Foundation, self-efficacy regarding seizure-related events increases. Education is crucial to increasing the safety of individuals who have epilepsy or recurring seizures. By intervening, injuries and emergency medical visits can be reduced or prevented entirely.

Locally, this helps provide a more inclusive and safe environment for a vulnerable community. If training is administered on a state-wide scale, we could see a measurable decrease both in the use of emergency medical services for seizure-related events and in the medical bill costs for those who live with recurring seizures. In medically underserved areas, any strain that can be taken off of existing healthcare workers helps increase the efficiency of the healthcare system as a whole. Emergency medical services struggle to keep up with the demanding needs of a growing patient base, especially in rural areas. By providing educational healthcare training, the strain on healthcare workers in medically underserved areas would be reduced. In addition, the amount of emergency medical services needed for seizure events will decrease, as well as the direct amount of medical bills individuals who have recurrent seizures are responsible for.

Throughout this project, we strove to gauge if the National Epilepsy Foundation's Seizure First Aid Training was a viable resource for increased self-efficacy of individuals in the event of a seizure. Not only did we determine that this training is effective in increasing the confidence of audience members regarding their ability to intervene in the event of a seizure, but also that it is effective in teaching knowledge related to epilepsy and other seizure disorders.

Figure 1: (Left) Picture from the Parkway Elementary School Seizure First Aid Training

Figure 2: (Right) Picture from the American Medical Student's Association Seizure First Aid Traini

REFERENCES

Crudden, A., Cossman, J., Sansing, W., & Burson, H. I. Emergency Room Demographics-Diagnoses, and Frequency of Use among Mississippi Medicaid Beneficiaries.

Nei, M., & Bagla, R. (2007). Seizure-related injury and death. Current neurology and neuroscience reports, 7(4), 335-341.

Sirven, J. I., Shafer, P. O., & Schachter, S. (2013, August 6). *Types of injuries from seizures*. Epilepsy Foundation. https://www.epilepsy.com/preparedness-safety/staying-safe/types-injuries

Tellez-Zenteno, J., & Nguyen, R. (2009). Injuries in epilepsy: A review of its prevalence, risk factors, type of injuries and prevention. Neurology International, 1(1), 20. https://doi.org/10.4081/ni.2009.e20

Wirrell, E. C. (2006). Epilepsy‐related injuries. Epilepsia, 47, 79-86.

Williams, J. M., Ehrlich, P. F., & Prescott, J. E. (2001). Emergency medical care in rural America. Annals of Emergency Medicine, 38(3), 323–327. https://doi.org/10.1067/mem.2001.115217

Yoon, D., Frick, K. D., Carr, D. A., & Austin, J. K. (2009). Economic impact of epilepsy in the United States. Epilepsia, 50(10), 2186-2191.