

Fire Safety for Children (FSFC):

A Simulation Toolkit

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ABSTRACT

Every year approximately 400-600 children under the age of 18 die in house fires across the United States. Currently, there is no safe simulation activity to educate children about fire safety in the home (without the danger). The goal of the Fire Safety for Children (FSFC): A Simulation Toolkit project is to provide fire safety education for the home in a mobile Simulation environment for children, and to be initially disseminated through Grand Terrace Elementary School. The objective of the Fire Safety for Children (FSFC) project is to provide and evaluate the effectiveness of the fire safety simulation education for the home within a mobile simulation to children through an evidence-based FEMA toolkit.

Keywords: Fire Safety, Simulation, knowledge, retention, Fire Safety Trailer Curriculum, children, school, education, community health, toolkit

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FIRE SAFETY FOR CHILDREN (FSFC): A Simulation Toolkit

Dedication

To my brave sister Crystal; who at a young age fought and survived along with myself, our family's home fire.

Fire Safety for Children (FSFC): A Simulation Toolkit

Executive Summary

Fires in the home kill children every year across the United States, and in the first quarter of 2017, more than 55 children died from fires. These types of deaths were preventable, as these homes had working smoke alarms ("Home fire fatalities in the news," 2017). These deaths can be attributed to a lack of fire safety education and awareness. Currently, most Fire Safety training has been facilitated by fire departments, and a Fire Safety Trailer is brought in to do the education and demonstrations.

Presently, there is no educational simulation activity that safely allows a child to experience the confusion and effects of a fire in the nighttime hours of sleep ("Basic fire escape planning," 2016). Children presently take part in school activities that teach them basic fire safety rules for the home. Most of this education is completed starting at an early age, and while this is a very appropriate action, it is still not enough to fill the gap between what children know about home fires, and what they need to know to avoid a fatality in the event of a home fire ("Basic fire escape planning," 2016). According to the National Fire Association (NFA), a person has less than two minutes to escape a home after the smoke alarm has been sounded. Once a fire happens in the home at night, even if the child has been through basic fire safety training, a child can react in panic. Terror can set in due to the dark of night, the black smoke, and a child's lack of ability to recall what to do if they have not had the opportunity to participate in a simulated exercise that involves applied practice of learned techniques (Bush, 2015).

During the project leader's adult life, she has been active in fire safety training using simulation in scouting clubs. The safety education activities were all simulation-based. Renaud and Suissa (1989), have shown that children learn better through simulation and are able to retain

those concepts through adulthood. Creating the fire safety mobile simulation laboratory grew out of the need for improved methodologies for fire safety education for children (Appendix A).

The purpose of this project is to design, implement, and disseminate an affordable teaching toolkit which will provide instruction and training for schools and service groups to execute fire safety events, and to educate children on how to exit a home during a fire without injury or death. Providing education pertaining to the devastation of home fires across the United States produced and developed a simulation-based product titled “The Fire Safety for Children (FSFC): A Simulation Toolkit” (Appendix A). Fire deaths are preventable, and the FSFC can play an important part in helping to impart knowledge to children in a simulation with minimal risk, potentially reducing the child mortality rate due to home fires.

The initial simulation project implemented the integration of simulation curriculum, using the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis (Appendix B). Using the SMART (Specific, Measurable, Achievable, Relevant, and Time-oriented) objectives and RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework methodologies formed the basis for the development of the FSFC: A Simulation Toolkit (Appendix C). Identifying the strengths and quickly recognizing the weaknesses with the SWOT analysis and integrating the reach and effectiveness of the RE-AIM methodology, allowed one to use the framework to create the best possible learning methods in a SMART measurable and time-oriented manner. This was done by implementing simulation versus demonstration to teach fire safety to children. Using these methods allowed one to use the knowledge and expertise necessary to recognize budget concerns, a FSFC product not well-known to create the best learning environment. The effectiveness of the program integrated with the methodologies was demonstrated in a local elementary school fifth-grade class.

Problem Statement

Every year across the United States, preventable home fires claim the lives of many children. Currently, the United States (U.S.) mortality for children under the age of 18 involving a house fire is about 400-600 per year, with a total of 3000 people in the U.S. killed by home fires annually ("Home fire fatalities in the news," 2017). This fire death statistic indicates that fire safety education is inadequate, which would indicate that children are not getting out of the home at the time the home catches on fire (U.S. Fire Administration/National Fire Data Center, 2016). Children's fire mortalities happen because they lack education and in a panic situation they fail to safely exit a burning home ("Important Fire Statistics | Blank Children's Hospital," 2017).

The 1970s brought in a new era of home fire safety skills with the push for fire alarms in the home. This new focus produced a dramatic drop in death rates due to home fires (U.S. Fire Administration/National Fire Data Center, 2016). Since that time, less than 10 studies have been completed on the topic of fire safety; and of those studies, none were geared toward children (Garcia, Dukes, Brady, Scott, & Wilson, 2016).

Statement of Purpose of Project

The purpose of this project was to design, implement, and disseminate an affordable teaching toolkit which will provide instructions and training for schools and service groups to execute fire safety events, and to educate children to exit a home during a fire without injury or death. Fire deaths are preventable, and the FSFC can play an important part in helping to impart knowledge to children in a simulation with minimal risk, potentially reducing the child mortality rate due to home fires. The FSFC was created to impact the way children acquire new knowledge, by recreating and simulating scenarios in which a home catches fire. The children

are then required to safely escape along with other family members through simulation games (Ambrosio Mawhirter & Ford Garofalo, 2016). Using simulation versus demonstration helps children improve their retention of fire safety knowledge.

Plan/Scope of the Project

The scope and purpose of the Fire Safety Games for Children is to change and improve the way fire safety education is presented, by adding simulation into the full educational curriculum ("PDSA cycle," 2016). The FSFC was implemented May 24, 2018, in Riverside, California at the Grand Terrace Elementary School for children ages 10-12, with a goal for future involvement with the National Fire Academy (NFA) and the Federal Emergency Management Agency (FEMA).

The idea for the FSFC project is to provide fire safety education for the home to children on a local and state level initially played out in elementary schools along with other venues, and eventually to move onto an international scale. The mission is to reduce the mortality of children during a catastrophic fire event. According to Ambrosio Mawhirter and Ford Garofalo (2016) all ages learn more effectively through simulation and because children are well-versed at playing dress-up and games, this helps to make simulation a familiar and non-threatening activity for them. In an effort to enhance a child's knowledge concerning home fire safety, this author and project leader created a mobile simulation laboratory. This author also developed an educational training curriculum to provide children with fire safety simulation participation, where they were trained in appropriate fire safety techniques. This simulation strategy training has proven to be very effective as quoted in the research of Ambrosio Mawhirter and Ford Garofalo. According to the Fire Marshal for the High Desert, she has observed that some counties with under-privileged and rural areas cannot afford a Fire Safety Trailer; therefore, many children miss the opportunity

to participate in the fire safety demonstrations and to learn through an affordable mechanism (Cooley, S., personal communication, March 2017).

The FSFC Simulation Toolkit will include the links necessary to guide individuals to the resources in which to find the tools needed to conduct a fire safety event. Some of the elements to include in the toolkit will be a list of items needed to construct a mobile simulation laboratory, instructions for building and installation of the door, the E-Z Up tents needed, the furniture, the agenda for the day of the event, the training manual that outlines the items needed to learn during the three scenarios, and the printed quizzes to assess learning. The cost of the Mobile Simulations laboratories is affordable at less than 1000 dollars per EZ Up tent unit and very easily portable to allow the smallest of groups to operate an event. Depending on the size of the event one unit could be used if the group is small, and more units for larger groups.

Problem and Significance

Fires in the home kill children every year across the United States, and in the first quarter of 2017, more than 55 children died from fires. These types of deaths were preventable, as these homes had working smoke alarms ("Home fire fatalities in the news," 2017). These deaths can be attributed to the lack of fire safety education and awareness (Bush, 2015) ("Important Fire Statistics | Blank Children's Hospital," 2017).

An innovative age of home fire safety was brought in by the easy accessibility of smoke alarms and this formed an effective drop in home fire death rates (U.S. Fire Administration/National Fire Data Center, 2016). Since that time, less than 10 studies have been completed on the topic of fire safety; and of those studies, none were geared toward children (Garcia, Dukes, Brady, Scott, & Wilson, 2016).

Fire safety education should begin early in a child's life. Most experts recommend that fire education should start as soon as the child can crawl, then walk, and continue progressively as teenagers, advancing into adulthood (Miltenberger, Egemo-Helm, Jostad, Flessner, & Gatheridge, 2005). At the beginning of 2017, the deaths of children related to home fires were all identified as occurring in homes that contained working smoke alarms (U.S. Fire Administration/National Fire Data Center, 2016).

According to Foronda et al. (2016), both adults and children alike absorb education through simulation and retain the knowledge because they apply what they learn by simulation and practice instead of exclusively learning about fire safety in a classroom. If the Federal Emergency Management System (FEMA) and the NFA adopt simulation as an educational tool, then the effects of the simulation instruction can potentially have far-reaching positive outcomes across the United States (Lateef, 2010). The risk for children dying in a home due to fire can be greatly reduced, as children will know how to react in an emergency if this type of applied practice and simulation is re-enforced (Miltenberger et al., 2009).

Students can acquire, observe, and maintain long term skills needed for fire escape, and simulation has demonstrated to be a highly effective pedagogy in many different applications (Holdsworth, Skinner, & Delany, 2016). Children will absorb the information with improved outcomes if they are able to apply what they have learned in the classroom during simulation of an at-home fire (Lateef, 2010). There are numerous types of teaching and the use of simulation pedagogy has proven to exhibit some of the better outcomes of learning (Taylor, 2010).

This simulation practice could increase the learning for children identified as part of the at-risk, rural, and under-privileged population (Bush, 2015). Part of the significance of this

problem, is that many fire departments cannot afford to purchase a Fire Safety trailer which can cost thousands of dollars. Using the FSFC simulation toolkit would enable firefighters to take the FSFC mobile simulation laboratory, a completely mobile and collapsible unit, wherever they are holding training courses (Appendix A). Thus, they would not require a truck and trailer, the gas to power the unit, semi-truck and trailer maintenance, or the storage of the trailer. Implementing the FSFC would allow firefighters to make use of this cost-saving technique, which can disseminate the fire safety education toolkit to children in counties and zones where they cannot otherwise afford a fire safety trailer (Cooley, S., personal communication, March 2, 2017).

Environmental Context

The initial FSFC event was held on May 24, 2018 in California at the Grand Terrace Elementary School (GTES) in Riverside, California, Colton Joint Unified School District (CJUSD) for approximately 74 5th grade students. It took place on the school yard of the GTES and near the outdoor lunch area where there were tables to sit on while waiting for the next item to happen on the agenda. The area also has a grassy area which is an ideal area to place the E-Z Up tents and also a pole to attach the inflatable palm tree to signify the safe meeting place.

Major stakeholders who attended the event included, Elementary school Principal, Grand Terrace Elementary School; the Safety and Risk Manager for Colton /Unified Joint School District, and the teachers and staff of the elementary school. Getting buy-in from the individuals mentioned above were key to approval and success of the FSFC project. Getting buy-in from the Education Services Committee was the final objective to be on the School District's approval list before setting the date for the next fire safety education event.

Looking at the SWOT analysis some of the strengths of the project include exclusiveness of the training implementation, simulation vs demonstration techniques, real-life experience

gained, the ease of sustainability, cost effectiveness, and mobility. Weaknesses of the project include a lack of interest by firefighters, as they already use fire safety trailers, lack of funding on the school district level, and lack of buy-in from volunteers and other stakeholders in the education system. Opportunities include exposure to the mobile simulation laboratory project, which is inexpensive when compared to the firefighters Fire Safety Trailers. The recent loss of many structures and homes in the wildfires of California have highlighted the importance for additional fire safety training. Until recently, homes had appeared to be mostly immune to rapid wildfire. Thus, there are wide-ranging and increased opportunities for fire safety education due to wildfires. Threats include a lower rate of home fires since the 1970s, no financial funding from the elementary school system, and lack of mobile simulation laboratory project exposure.

Market/Risk Analysis

Simulation strategy training has proven to be very effective as quoted in the research of Ambrosio Mawhirter and Ford Garofalo. According to the Fire Marshal for the High Desert, she has observed that some counties with under-privileged and rural areas cannot afford a Fire Safety Trailer; therefore, many children miss the opportunity to participate in the fire safety demonstrations and learn through an affordable mechanism (Cooley, S., personal communication, March 2017).

The FSFC Simulation Toolkit includes the links necessary to guide individuals to the resources in which to find the tools needed to conduct a fire safety event. Some of the elements to include in the toolkit are a list of items needed to construct a mobile simulation laboratory, instructions for building and installation of the door, the E-Z Up tents needed, the furniture, the agenda for the day of the event, the training manual that outlines the items needed to learn during the 3 scenarios, and the printed quizzes to assess learning. The Mobile Simulations laboratories

is affordable at less than 1000 dollars per E-Z Up tent unit and very easily portable to allow the smallest of groups to operate an event. Depending on the size of the event; one unit could be used for a small group, and more units utilized for larger groups.

When teaching children a new skill, one must consider potential hazards while also focusing on minimizing risk and being aware of the emotional and physical well-being of children who have been in a previous house fire.

Faith Integration and Theoretical Framework

Psalms 46:1 says that, “God is our refuge and strength, and an ever-present help in trouble”, New International Version (NIV). Following the laws of God will offer protection and can keep us safe in times of trouble. The author believes that God requires a person to do one’s best to protect oneself and family. Having a good fire safety plan in the home is one way to accomplish that goal. As His followers, Christ taught us to go and teach the world; thus, teaching fire safety to children also follows that same model. Community health promotion integrates and encourages a relationship with family, along with teaching others the love of God. Implementing the FSFC is one way to encourage this health promotion process. Mark 16:15-16 reads, “And he said unto them, go ye into all the world, and preach the gospel to every creature”, King James Version (KJV). Teaching people to be healthy regarding their safety in the home is one way to spread the love of God. Lastly, to promote better health practices, Proverbs 22:3 instructs a prudent person to foresee danger and take precautions.

Framework Integrated

There were three measurement and analysis methodologies employed in this project: RE-AIM, SWOT and SMART. The first, the RE-AIM framework (Reach, Effectiveness, Adoption,

Implementation, and Maintenance) is easy to comprehend and effortlessly translated (Appendix C). Some of the key components of the RE-AIM framework allow the FSFC to inspire organizers, assessors and stakeholders to pay close attention to crucial project fundamentals to improve implementation and provide sustainable adoption of the Fire Safety for Children Simulation Toolkit to schools and groups all over the United States (White, Dudley-Brown, & Terhaar, 2016). Implementing simulation will allow the objectives of the project to obtain the applied use of the RE-AIM framework to re-evaluate changes when they become necessary to provide longevity for the project. Keeping the main objective in mind, the goal is to encourage learning along with absorption of fire safety while in a simulated safe environment, and to gain auto-recall in the moment of need if it should ever arise (White, Dudley-Brown, & Terhaar, 2016). Using the RE-AIM will reach the target audience, and measure efficacy and ensure adoption by schools and groups and continue the reliability of implementation of the FSFC and maintain it over the long term (White, Dudley-Brown, & Terhaar, 2016).

Due to the nature of the “Fire Safety for Children” (FSFC): A Simulation Toolkit project, individuals from diverse backgrounds can participate with the team members of the fire safety event volunteers (De Meij et al., 2008). The use of the RE-AIM framework allows for the easy movement of ideas between team members, who might not have knowledge of certain processes otherwise (White & Dudley-Brown, 2012). Utilization of the RE-AIM framework model will allow the FSFC program to make quick adjustments of any identified problems for a smoother running outreach education and health promotion program (White & Dudley-Brown, 2012). The Reach section of the framework was the dissemination of the FSFC simulation toolkit to the Grand Terrace Elementary School, Colton Unified School District, FEMA, NFA, WHO, UN, and National Fire Protection Association (NFPA) websites.

Literature Review and Evidence Synthesis

According to various print and online US news agencies, between January 1, 2017, and May 27, 2017, there were more than 1,000 civilian mortalities across the United States due to home fires ("Home fire fatalities in the news," 2017). Of that number, approximately 25% were children. The Federal Emergency Management Agency (FEMA) and the National Fire Academy, offer many guides for educating children about fire safety. FEMA has a Fire Safety Trailer curriculum that provides an abundance of useful information along with age appropriate quizzes for children of all ages. The Fire Safety Trailer Curriculum is helpful for individuals who might be interested in constructing their own safety trailer. Unfortunately, with the Fire Safety Trailer Curriculum, the focus is on demonstration and not simulation. Fire departments can also aid in teaching children about fire safety (FEMA, U.S. Department of Homeland Security, U.S. Fire Administration, National Fire Data Center, 2016).

Clearly, with the high mortality rates among children due to the lack of appropriate fire safety education in schools and at home, there is an educational need to increase children's fire safety knowledge. There appears to be an inverse relationship between childhood fire deaths and socio-economic status of children according to the reports published by FEMA. If children in impoverished and rural areas are taught improved fire safety, this could conceivably reduce the number of childhood deaths due to fire.

During a review of the literature related to home fire safety, it was noted that the NFA provides access to an informational site that contains a 300-page document, and many other documents helpful in teaching fire safety. This document provides systematic instructions to every age group of children regarding fire safety skills. The site also provides information on how to teach appropriate fire safety skills in the Fire Safety Trailer. In addition, the website also

includes information on various grants related to the Fire Safety Trailer. The grant process is time-consuming for many fire departments, and if the need for this type of training is not realized, it can be difficult to motivate the appropriate individuals to apply for these types of grants.

The widespread use of smoke alarms and appropriate fire safety education has helped to lower the mortality rate related to home fire deaths to approximately 600 children per year according to the NFA and FEMA. This number is still too high when you consider that each number represents the life of a beloved child. Because evidence has shown that children learn better by doing, simulation training improves the process by which they learn, thereby potentially decreasing mortality related to inadequate fire safety education (Renaud & Suissa, 1989).

Project Objectives/Outcomes

One short-term goal of the project was to teach a group of approximately 100 5th graders at the GTES in May 24, 2018 through simulation training laboratories. A second goal was to educate and disseminate this same knowledge via simulation training laboratories to thousands of children in elementary schools across the state of California, and ultimately throughout the entire United States educational system. On a national level, the project information will be circulated to FEMA and NFA through their public websites. The objective is to spare children's lives, educate them to react safely, and support their expeditious exit of a smoke filled or burning home without injury.

Objectives Stated in Feasible and Measurable Terms (SMART) and (SWOT)

In addition to the RE-AIM framework, the other two methodologies used were the SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), and the SMART objectives (Specific, Measurable, Achievable, Relevant, and Time-oriented). Using the SWOT analysis, a lay person can look at the positives, negatives, and other related issues that arise regarding fire safety education, whether they be good, bad, or spell the downfall of a project, and/or help with the planning phase (Appendix B).

Specific objectives include aligning with the Red Cross goal of reducing the house fire morbidity rate of children by 25 percent by 2020, and to distribute the FSFC toolkit to other school districts such as the San Bernardino, Fontana, and Rialto School districts by the end of the summer 2019. A future goal is to distribute the FSFC toolkit internationally to the UN, WHO, and worldwide organizations, and to disseminate the FSFC simulation toolkit to FEMA and NFA via their respective websites by September 2020. Long term goals measuring objectives include ongoing NFA and FEMA research of mortality rates and fire safety education integration, evaluating the adherence to Red Cross goals to reduce the home fire morbidity rates, and assessment of ongoing simulation training at schools. In order to achieve these objectives, continuous monitoring of the FEMA, Red Cross and other fire agency programs will be completed. The relevance of these objectives is evidenced locally in the need for repeated and improved fire safety simulation education in the school system, and accessible home fire safety training on the community level in light of the southern California wildfires. The relevance of these objectives is evidenced internationally by the higher rate of mortality due to the lack of fire education resources, training, and funding in many countries. Time-oriented objectives include the dissemination of the FSFC toolkit to other school districts by the end of the summer 2019,

reducing the house fire morbidity rate of children by 25 percent by 2020, an 80% positive change in knowledge, skills, and attitudes as evidenced by an 80% increase of the FSFC participants with increased fire knowledge and/or successful escape during the fire simulation, the dissemination of the FSFC simulation toolkit to FEMA and NFA via their respective websites by September 2019, and the international dissemination of the FSFC simulation toolkit via UN, WHO, and other websites that offer fire safety education by August 2019.

Methods/Implementation

Participants

Project participants were 74 children, ages 10-12, who were in the 5th grade at Grand Terrace Elementary School. The participating elementary school was identified by the principal as having never received this type of training before. This was the first Fire Safety for Children event of its kind designed specifically for fifth-graders. The participants were identified through the teachers and principal at the Grand Terrace Elementary School (GTES) and they were recruited from the GTES 5th grade class by the principal and teachers via a flyer, consent forms, and a letter sent to the parents (Appendix D) (Appendix E). To alleviate any potential harm or risk to the participants, there were no participants participating in this event who were identified as falling into the following two categories: having been through a fire previously or participants who suffer from asthma. After the parents had signed the consent, the participants were allowed to choose whether or not they wanted to participate (Appendix F). They could also leave at any time if they were uncomfortable, and all participants completed the event.

Due to the nature of the participants being part of a vulnerable group of human subjects, a full Institutional Review Board (IRB) at California Baptist University was required and thus took longer than most IRB submissions (Number 050-1718-FULL) (Appendix G) (Appendix H). All

data is stored and locked in a secure cabinet at researcher's home. The project manager will hold the key and at end of study project, per University guidelines, information will be stored for three years, then destroyed. No names will be used or be identifiable.

The School District did not have an Institutional Review Board (IRB) but they did have a similar process to minimize risk and ensure that the event participants and all other involved parties were safe throughout the simulation (Appendix I). In adherence to the school district's security compliance, a criminal background check of the project leader was performed. Upon satisfactory results, a date for the teacher/volunteer training event, the student fire safety event, and the post-quiz return to the school were approved and scheduled.

Instruments

The FSFC: A Simulation Toolkit was developed by the author and her team to produce the safest and most effective simulation. The mobile simulation laboratory taught the same scenarios they taught in the firefighter's Fire Safety Trailers. It was not just a demonstration, but required acting out, through simulation. The FSFC project taught three scenarios related to home fires: first simulation of a child-themed bedroom; second another child-themed bedroom with an escape window; third a living room/apartment scenario. The scenarios stemmed from key points taught by FEMA and the NFA in schools.

The mobile simulation laboratory (E-Z Up tent) had simulated walls that came pre-packaged with two windows to simulate a bedroom or living room. Decoration was used along with portable twin beds to simulate a bedroom. The bedroom included items typically found in a child's bedroom, such as stuffed animals and toys. There was a simulated door made of PVC pipe, and non-toxic smoke (fog machine) leaking under the doorway (Appendix J). Due to

weight, size, and safety concerns dresser drawers were not used. The living room simulated apartment living on a second story building.

The first scenario included educating the participants to crawl out of the house when there is smoke and/or an activated smoke alarm. The second scenario included educating the child to crawl out of the window if crawling out of the door was unsafe. The third scenario included educating the child to stuff a blanket under the door if smoke is coming in a bedroom, and it included waiting for rescue in the apartment living room.

Using the simulation toolkit will allow one to assemble the proper pieces to have a successful event (Appendix A). The complete simulation toolkit will give comprehensive instructions on how to hold a fire safety event at an elementary school using teachers, volunteers, and using safe teaching methods geared toward children to enhance the best possible learning (Appendix S).

Immediately after the introduction of the project leader was made, the participants answered a pre-quiz which consisted of 10 questions obtained from the Fire Safety Curriculum booklet published by FEMA and NFA (Appendix M). The same questions that were presented on the pre-quiz were the same as the post-quiz post-simulation event, administered by the teachers in their respective classrooms. Fifty-four participants completed the post-quiz one week later in the classroom. Scoring consisted of one point for each correct answer, and each wrong answer received zero points. There were no multiple correct answers, with a maximum score of 10 points for the quiz. The pre-briefing was done after the pre-quiz and explanation of the activity was made at that time.

Procedures

As requested by the elementary school principal, the Train the Trainer event for teachers/volunteers was offered during school hours for the teachers/volunteers at the elementary school a week prior to the subject learning group (Appendix K). Part of the purpose of the training was to sustain the project by educating “Train the Trainer” replacements. During the “Train the Trainer” event on May 16, 2018, each teacher/volunteer was given an agenda, three scenarios, and a very brief description explaining what was to happen during each of the scenarios. The parent information/Spanish speakers meeting held earlier in the day with a qualified interpreter present, yielded no parents attending. The principal stated that this was a normal occurrence for any type of parent meeting.

The FSFC event for the participants lasted approximately 90 minutes with a brief introduction followed by a pre-quiz of 10 questions (Appendix L) (Appendix M). The questions were read aloud and the 5th grade participants could ask questions if they didn’t understand the queries on the pre-quiz. A pre-briefing took place after the pre-quiz.

There were three mobile simulation laboratories to accommodate the number of participants partaking in the three FEMA-based scenarios, for a total of six stations (Appendix N). The participants participated by either watching or acting out one of the three scenarios. The mobile simulation laboratory had three stations inside and three stations outside of the E-Z Up tents by the windows (Appendix O). During the event it was easier for the participants to regard the laboratories as tents. The safety meeting tree was located in clear view away from all the tents to signify the safety meeting location in the event of a real home fire per FEMA and NFA guidelines. After running the simulation scenarios, there was a debriefing where the participants could ask questions or voice concerns. The participants did not have many questions.

Teachers/Volunteers were at each watching or scenario acting station, plus there was a volunteer at each of the smoke machines which allowed for a safer event. The project leader, who was outside the mobile simulation laboratories, would instruct the volunteers to start the smoke machines, then the leader would sound the smoke alarm.

The FSFC team returned to the classroom one week later to administer the post-quiz. The quiz questions were the same for the pre-quiz and post-quiz. The teachers had previously numbered the quizzes according to their individual class rosters. Each participant had the same corresponding number for the pre-quiz and the post-quiz, so they were able to match the quiz number of the one-week post-quiz with the pre-quiz without identifying the participants by name. Participants who were not present on the FSFC follow-up visit to the school did not take the post-quiz.

Analysis

The FSFC pre-quiz was compared with the FSFC post-quiz data using a paired t-test, to ascertain whether they had an increase in knowledge of home fire safety due to the simulation experience(Appendix R) (Appendix P). The FSFC pre-quiz data was linked with the one-week post-quiz data, to determine if the FSFC baseline knowledge had increased and had been preserved after one week. The objective was to determine if there had been an advance in knowledge and retention after the simulation exercises and the data suggests a maximum 80% improvement.

All other questions showed a minimum of at least 30 % improvement with most questions showing more than a 40% improvement. Two questions showed little improvement. Two questions showed no improvement and, question one of the quizzes, showed a sharp decrease in knowledge related to “Stop, Drop, and Roll”. Overall most questions showed some

improvement (Appendix R). Ideally, the post-quiz would have been offered later in the school year but due to IRB and school approvals, time constraints, and school getting out for the summer, the one-week post quiz was administered.

Results

The participants did appear to learn and retain the fire safety knowledge taught to them using simulation methodologies and the results of the post-quiz showed that they learned better for some of the questions that directly related to the simulation methods used at the fire safety event. In the question directly related to the simulation exercises, the question that showed the most improvement was question five in which showed an 80% advance in knowledge noted. The pre-quiz data compared to the post-quiz data suggested an improvement in learning. The participants took longer to take the quiz at the FSFC event on May 24, 2018, but most participants did not have any trouble answering the questions. All 54 students who took the post-quiz showed improvement on the quizzes.

Both quizzes utilized the same format from the Fire Safety Trailer Curriculum booklet published by FEMA and NFA and had 10 questions each for the 5th grade level. Three questions, numbers four, five and ten, showed significant improvement (Appendix Q). The remaining seven questions did not show improvement. After the pre-quiz, the project leader reviewed the correct answers as they relate to the three scenarios. On question eight of the pre-quiz, regarding proper candle burning practices in the home, the project leader told her own story about a fire in her house when she was younger due to candles being left unattended by her mother. This may have skewed the results of the post-quiz, as approximately 90 percent of the participants marked the answer incorrectly.

The single question that showed the greatest improvement was question number five, pertaining to checking the back of the door for heat with their hand. The participants used the back of their hands to check the door in two of the E-Z Up tents. This would suggest that participants did indeed learn through performing the scenarios. Results of this project would suggest that participants learned and retained skills from the FSFC event.

The participants were also asked if they felt as though they had learned anything, and 100% specified that they had learned during the simulation exercises, particularly to crawling to the door to check and see if it was safe before exiting a room. Additionally, they were given time to describe what they liked best or least. One of the most frequent responses was that they did not feel like they needed to be given further instructions on what they were expected to do in the tents. They felt like the project leader had explained the scenario satisfactorily and they preferred to act out the scenarios without further explanations. For example, inside the mobile simulation laboratories a teacher would instruct the students to get on the floor and then check the door. The participants did not feel that instruction was necessary. This could have potentially been a breakdown in the communication at the teacher/volunteer training event.

Plan Aligns with Objectives/Outcomes

Using the elementary school as an avenue to promote the FSFC in a fun and creative way reinforces fire safety knowledge. Children of all ages like to have fun while learning. Employing fun simulation training scenarios strengthens the fire safety-learning project and helps increase the length of time children retain the knowledge to safely exit a house during such a distressing event.

Lack of fire safety education becomes evident when looking at the morbidity and mortality rates in the United States ("Home fire fatalities in the news," 2017). Providing fire

safety instruction to children in a manner meant to increase the successful absorption and retention of knowledge is an efficient way of teaching fire safety to children. Using simulation scenarios is an effective form of providing opportunity for applied practice, in addition to the use of games to provide valuable opportunities to reinforce the education of fire safety skills (Chen, Ho, & Lin, 2015). When remembering the most successful techniques for learning in school, one will recall that play-acting or applicable practice during games and other learning activities was among the most successful, regarding creating confidence in knowledge absorption (Foronda et al., 2016).

Despite the fact that since the early 1970s, fire mortality has drastically been reduced, many children still die every year from something that is preventable ("Home fire fatalities in the news," 2017). If the patterns observed from year to year concerning inadequate fire safety education and mortality have not changed, different methods of education need to occur to decrease fire deaths of children. The improvement of knowledge acquisition, attitude, and fire safety skills due to the FSFC project was suggested and evidenced by improvement of the post-quizzes and observation of the children participating in the project. Presenting education in a fun way for children, such as running scenarios in a life-sized simulated bedroom/house and to provide simulation exercises can enhanced learning (Lateef, 2010).

Effectiveness of Marketing and/or Business Plan

Currently there is a logo that has been made which will undergo revision before the end of the summer 2019. It includes an artwork design for FSFC. Most advertising will be completed through e-mail and social media, i.e.(Facebook pages). This will minimize costs for advertising and will help the distribution of the project if monies for promotion are truncated. Long-term plans include having FEMA, NFA, the UN, and the WHO post the simulation toolkit on their

websites, in addition to their other posted fire safety projects. The websites for dissemination of the FSFC will be on other agency and school district websites located under the Fire Safety Education heading.

The Risk Manager for Colton Joint Unified School District, the Safety Risk Manager and the Principal of GTES are the primary stake-holders and are both pro-education and pro-FSFC and did a lot of promotion in the school including informing the teachers, parents, and children about the fire safety program. They also promoted the FSFC to other school districts and received optimistic responses from other districts. Safety for children is essential so great care was taken to minimize and alleviate any emotional, psychological, or physical risk. They also promoted the FSFC to other school districts and received optimistic responses from other districts as well as fire department educators.

Finances and Resources

The purpose of the FSFC is to educate children on how to react and stay safe in the event of a home fire; therefore, efforts have been initiated to assign the FSFC with the designation of a non-profit organization, thus allowing the FSFC to provide services on a donation or grant basis to cover expenses. Donations were offered by interested community members to help fund the FSFC; however, at this point, the donations were not significant enough to sustain the initial project, so the project leader will seek grant funding to ensure long term financial success. Because the initial FSFC project was funded by in-kind donations, a grant funding structure was deemed more appropriate as outlined in the Fire Safety Trailer Curriculum booklet published by the National Fire Association. These grants are available under the Homeland Security through FEMA and the NFA.

The project was designed to create an affordable way to teach children in the most effective way using the least amount of financial outlay. Conducting a FSFC event can be done under one thousand dollars and perhaps even less if one were to have possession of some of the needed supplies (Appendix R). This project helps to create sustainability for Fire Safety for Children and using the simulation creates retention of fire safety knowledge.

Project Success

The importance of this Doctor of Nursing Practice (DNP) project can be evidenced by the fact that every year many children die in home fires across the US. Most of these home fire deaths remain preventable with appropriate fire safety training. It is the hope of the DNP student and project leader that with the data gathered at the FSFC event on May 24th, 2018, will shed light on the need for improved fire safety simulation (Garcia, Dukes, Brady, Scott, & Wilson, 2016).

The stakeholders at the end of the project receive a plaque and certificate of appreciation to commemorate the completion of the FSFC. After the initial FSFC event and final approval by the College of Nursing at California Baptist University, the FSFC instructions and simulation toolkit is intended to be disseminated via FEMA, NFA, UN, and WHO websites.

Implications for Practice

Much of fire safety education in schools is presented by school and Fire Safety Officers that work for the Fire Departments across America. This is not the case on an international scale. Fire Safety Education does not necessarily need to be carried out by fire personnel, as nurses are also taught early in their training how to educate patients. This skill extends out into the community health field. School nurses can help implement fire safety simulation education into schools and offer improved community health for their young constituents and families.

Other uses for the mobile simulation laboratory could include practices such as safety training for earthquakes, safety practices in the home, remote education of children in far rural areas such as Alaska, and areas where having a simulation training unit would otherwise be prohibitive in cost (Appendix S). The educational implications for nurses could be far reaching in terms of their patients and families utilizing the mobility of the unit. A mobile simulation unit could also be used to conduct fire drills for clinics with smaller numbers of nursing staff to simulate a fire and subsequent evacuation of a building, as currently it is cost prohibitive to conduct a fire drill where all staff and patients are evacuated at the same time. Instituting fire drills in a simulated work environment with a mobile simulation laboratory unit could provide necessary training to nursing staff in small groups and prepare them for an actual emergency, thus reducing the risk of injuries and potential for loss of life to staff and patients.

Recommendations

Ideally, there would have been more time allotted between the student fire safety event and the post-quiz return dates to evaluate the effectiveness and further retention by the students of the simulation training. But due to the school year ending in a matter of days, no future dates were available. The event was still deemed successful in what it accomplished for learning and retaining on fire safety by the project leader, the children, and the stakeholders.

It is evident that training children through simulation exercises will teach proper response in a catastrophic fire event. The results suggest that children do learn and retain via simulation. Integrating simulation standardization into fire safety training at schools would enhance education for children across America by utilizing evidence-based simulation pedagogy, for

further research into how children learn by play-acting and what it is that inspires and enhances learning.

The FSFC project hopes to align with the American Red Cross, with the additional help of their partners and sponsors in their current goal to reduce morbidity that transpires in the home by 25 percent in the year 2020. By teaching children with the FSFC to respond in a positive and constructive way during a fire event, it is the further hope of the DNP student/project leader and the FSFC project to reduce the mortality rate of children, due to inadequate fire safety education, on an international scale.

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Appendix A**Fire Safety Simulation Toolkit****PART 1: Course Syllabi or Lesson Plan**

The Fire Safety for Children should last about 90 minutes, if following the Fire Safety Event agenda. The purpose is to have children learn by acting out scenarios. The elements should contain the welcome, purpose, pre-quiz, pre-briefing, simulation activity, and debriefing. The post-quiz does not need to happen at this time, but questions from the quiz could be talked about in the debriefing.

PART 2: Teaching and Learning Activities

Learning through simulation:

The project is meant to simulate versus demonstrate and there for providing better opportunities for longer retention, so student participation is crucial. The goal is to have children retain the knowledge long after the event and react automatically in the event of an actual home fire.

PART 3: Learning Resources

In order to assess retention and knowledge, administer a pre-quiz and a post-quiz. The post quiz can be administered as soon as one-week post fire safety event and up to three months post event. For age appropriate quizzes, refer to the Fire Safety Trailer Curriculum.

https://www.usfa.fema.gov/downloads/pdf/publications/fire_safety_trailer_curriculum.pdf

PART 4: Materials and Supplies Needed for Fire Safety Event

Agenda, check list, door construction instructions, assent form, consent form (may be different for your school or organization), training module for teachers/volunteers, scenarios, quizzes, letter to parents (or similar letter), recruiting script, and mobile simulation laboratory configuration and skill process.

PART 5: Train the Trainer: Teachers/Volunteers

The training module to train the trainers uses all the elements of the fire safety simulation event. One should have at least one mobile simulation laboratory erected for the training as it is difficult visualize the elements needed for the fire safety event. Evaluate learners-new trainers by debriefing after training and return demonstration.

Appendix B

SWOT Analysis

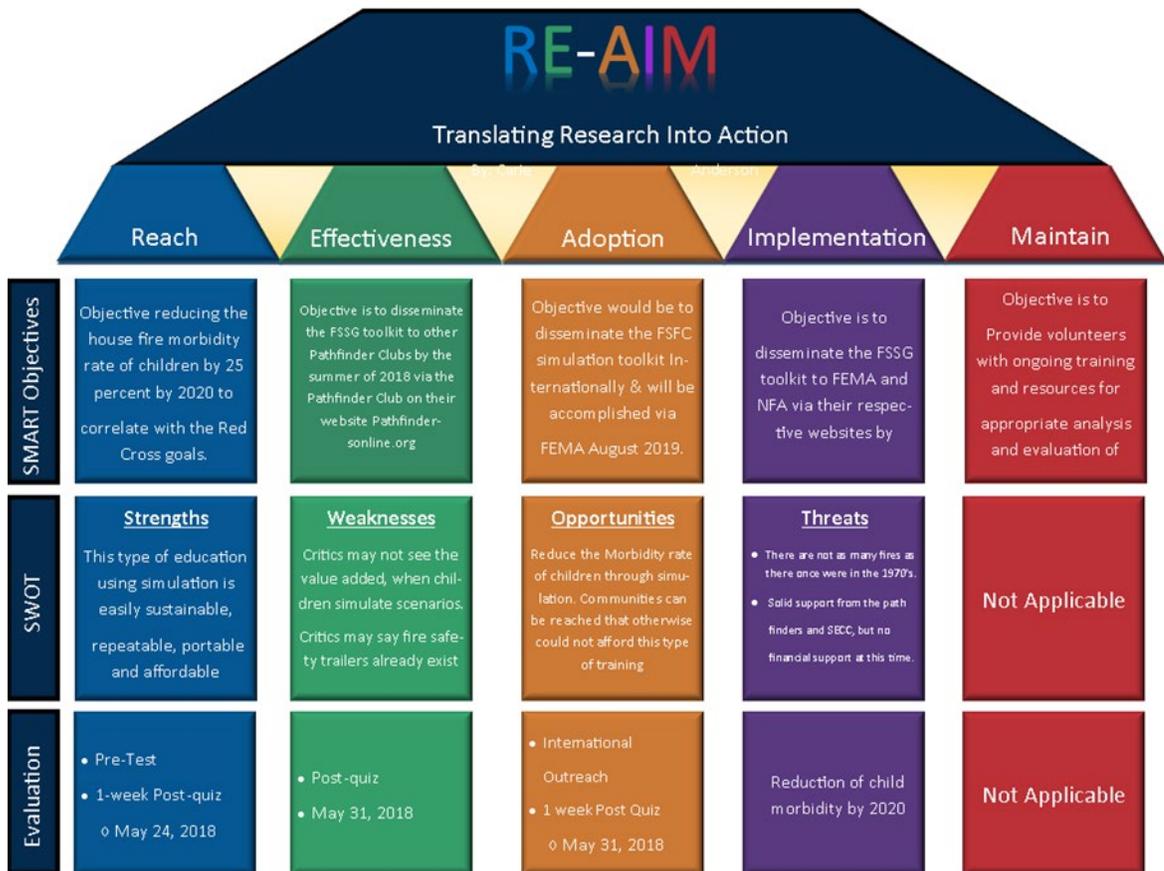
- No one else is utilizing this type of fire safety education
- Simulation vs demonstration
- Simulates real life
- Easily sustainable, affordable, & collapsible

- Teachers/principals may not see value added
- Fire safety trailers already exist
- No financial support

- Reduce the morbidity rate of children through simulation education
- Reach communities that otherwise could not afford a Fire Safety Trailer
- Simulation is an effective children's teaching modality

- There are not as many fires as there once were in the 70s
- Infinitesimal budget
- Product is not well-known

Appendix C



Appendix D

Informed Consent for Fire Safety for Children (FSFC)



Introduction of project

I am **Carie Anderson**, a doctoral nursing student at California Baptist University, in Riverside, California. I am doing a project, which might help your School, or other Groups to help 5th grade children become more aware about fire safety through education and activities. In the project, we will talk to many children and ask them several fire-related questions. Whenever project leaders study children, we talk to the parents and ask them for their permission. After you have heard more about the project, and if you agree, then the next thing I will do is ask your child for their agreement as well. Both of you must agree independently before I can begin.

Participation is Voluntary

If you choose not to have your child participate in the fire safety activities, any services/activities that your child receives at the elementary school will not change. We know that the decision can be sensitive when it involves your children and a project that includes the topic of fire safety. You can ask as many questions as you like, and we will take the time to answer them. You can think about it and tell me what you decide later. Your child can quit at any time for any reason.

What can I expect if my child takes part in this project? Your child will be asked to complete a brief quiz regarding fire safety. This takes place in the classroom and takes about 10 minutes. Afterwards, they will participate in a supervised co-ed fire safety simulation activity that lasts about 40 minutes. The activity will include: how to safely exit a house during a fire event, check the door for heat, crawl out the window if the door is hot, and stuff blanket in door if there is smoke. Two weeks later, your child will be asked to complete the same quiz regarding fire safety. This will also take place in their classroom and will take about 10 minutes. The responses from these two quizzes will be compared by the project leaders. The quizzes will be read aloud, and the child can give the answer that they want or have the project leader or teacher assist if needed to help circle answers or leave blank.

What are the risks and possible discomforts?

We do not anticipate any risks greater than what the child will experience in daily life, we will talk about fire safety and that may sensitive for some children. The simulation activity will be supervised and are FEMA-based scenarios on fire safety principles. If your child experiences uneasiness, you may contact Carie Anderson, or the elementary school counselor, Kristen Smith at (909)580-5032, or the San Bernardino behavioral health at (909)386-8256. A child can choose to withdraw at any time.

Duration of the project.

We are asking your child to participate in an anonymous pre-quiz, education, and safety simulation activity, 1-week anonymous post-quiz at the Grand Terrace Elementary School, which will take about 1 hour of her/his time. We will do this at the school in May 24, 2018. There is a pre-quiz and post-quiz we will provide to your child which we can do with her/him if

they so desire. Altogether, we are asking for about **1 hour** of your child's time, *and about 5 minutes of your time to fill out consent.*

If my child takes part in this project, how will my child’s privacy be protected? What happens to the information you collect?

This consent form will be kept separate from your child’s anonymous quiz, which will not have any identifying information. The pre and post-quiz will be completed in the classroom.

Will I be compensated for Participating in this project?

There is no payment for participating in this activity.

Who to contact for questions, concerns or complaints.

If you have any questions, you may ask them now or later. If you wish to ask questions later, you may contact any of the following:

Dayna Herrera, DNP *California Baptist University College of Nursing, faculty advisor*

Phone: 951-343-4955 Email: dherrera@calbaptist.edu

Carie A. Anderson, MSN, NP, RN, DNPc-Student, On-site project leader, PH:530-321-7971

Certificate of Consent

I have been asked to give consent for my child to participate in this project, which will involve completing 2 quizzes based on fire safety, education, and simulation activity at the Grand Terrace Elementary school. I understand that the child will also be asked to give permission and that her/his wishes will be respected. I have been informed that the risks are minimal and may include scraping knees, tripping on the carpet, or bumping into another child. I am aware that there may be no benefit to either my child or me personally and that we will not be compensated. I have been provided with the name of a project leader who can be easily contacted using the number, I was given for that person. I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked to have been answered to my satisfaction. I consent voluntarily for my child to participate in this project and understand that I have the right to withdraw her/him from the project at any time. Consent must be turned into teacher to participate one day before event.

- Yes, I consent to participate. I understand I can change my mind
- No, I do not wish to have my child participate in the project.

Print Name of Parent or Guardian

Date: (00/00/2018)

Carie Anderson/ Project leader

Signature of Parent or Guardian

Date:

I, the parent/guardian have accurately read the consent form for the child participant, and the child has had the opportunity to ask questions. I confirm that the child has given consent freely. This project has been reviewed and approved by the Institutional Review Board at California Baptist University (IRB # 050-1718). They can be reached at by emailing irb@calbaptist.edu, If your questions, concerns, or complaints are not being answered by the project leader, if you cannot reach the project leader, if you want to talk to someone besides the project leader, or if you have questions about your rights as a

Appendix E

Dear Parent,

Hi! My name is Carie Anderson, the project leader, and I am a doctoral nursing student at California Baptist University. I'm hoping to understand more about Fire Safety for children. The Fire Safety Education will be done via simulation and should be a lot of fun and done at the elementary school on **Thursday, May 24, 2018**. We will learn about fire safety if your house catches fire at night (Darkness will not be simulated) and what to do in case of fire. This learning event will take place at the school along with the school teachers helping with the fire safety event.

I would like to ask your child a few questions about fire safety and include them in several activities related to fire safety, but before I do, I wanted to make sure that is okay with you.

I invite you to read, sign, and date the attached a consent form allowing your 5th grade child to participate in the event. If you have questions about this activity to be conducted on **May 24th, 2018**. Prior to signing the consent, if you still have questions you can attend the question & answer meeting scheduled at the school for May 16, 2018, 8:30 am – 9:00 am. I will be available at the school to answer your questions if you have any.

Once your questions have been answered, and you choose to have your child participate, please sign, date, and return the attached consent form. Prior to the event, I will also ask your child if he or she wants to participate in the activity. Participation is voluntary; if you decline to consent **or** your child chooses not to participate despite your signed consent, he or she will participate in an alternate activity, which includes an activity planned by the principal and teachers.

The activities will take about 60 minutes of your child's time and will include an anonymous pre-quiz on Fire Safety. The quiz is not graded, and there are no right or wrong answers. (It will take about five minutes of your time to fill out the consent form). Your 5th grade child can skip any question they do not want to answer during the activity or stop answering questions and or leave at any time if they are uncomfortable at the fire safety event. They can leave questions blank if need be. If they don't know the answer, they can give it their best guess. I will not ask them to put their name on the paper!

I will return to the classroom in 1 week after the event to have the children retake the same quiz to compare how much they remember what was taught. The goal of the Fire Safety (FS)for children project is to provide and evaluate the learning of the fire safety simulation education for the home within a safe mobile simulation environment.

Sincerely,

Carie Anderson, MSN, RN, NP, DNPc

An in-person question-and-answer meeting at the school for the Fire Safety event will be held on May 16th,2018 at 8:30 am- 9:00am at the school, or you can contact me at CarieAlise.Anderson@calbaptist.edu. A Spanish-speaking translator will be available to respond to questions at the in-person meeting before the event on Thursday 24th ,2018

Appendix F

Verbal Assent from Minors for Fire Safety for 5th grade children

If research participants are minors (less than 18 years old in California), their parents or guardians *must* give written consent; then verbal assent must be secured from the minor. (letter will be sent home with consent form in a packet.)

Assent script with 5th grade child being interviewed:

Teacher will say only to 5th graders whose parents have signed the consent to participate:

Carie Anderson, the project leader, is a doctoral nursing student at California Baptist University. She is hoping to educate you with more understanding about Fire Safety for children. The Fire Safety Education will be done via simulation and should be a lot of fun.

We will learn about fire safety if your house catches fire at night and what to do in case of fire. The event will take place here at the Grand Terrace Elementary school. There will be an alternative activity for those who choose not to participate.

Your parent/guardian signed a consent form saying it was OK for you to participate in the Fire Safety event, but I wanted to make sure that was okay with you.

First you will answer a few questions about Fire Safety, which will take about 5 to 10 minutes, if you don't understand the questions, we will read them aloud, and then give it your best guess. You can skip any question you don't want to answer or stop answering questions at any time. I won't even ask you to put your name on the paper! If you feel uncomfortable with any questions, you do not have to answer.

The next part of the Fire Safety Event is where we will go through scenarios in which will be done the mobile simulation lab which consists of an E-Z-Up tent with furniture inside. We will practice escaping if there were smoke in the house, next we will practice escaping out of a window and shoving blankets under the door if smoke were getting in your bedroom, and we will also practice checking the door to see if it is hot and waiting for firemen to rescue if we were in an apartment on the second or third floor. After the scenarios, there will be a time for questions

It will take about 60 minutes for the fire safety event. You get to say if you don't want to participate at any time.

Project leader will return in 1 week to repeat the same quiz to see what you remember. That should take about 10 minutes.

Appendix G

Human Subjects Training Certificate



Appendix H

IRB 050-1718-FULL Approval

CA

Carie Alise Anderson

Thu 3/15, 7:11 PM

From: Institutional Review Board
Sent: Tuesday, March 13, 2018 2:44 PM
To: Carie Alise Anderson
Cc: Dayna Herrera; Institutional Review Board
Subject: IRB 050-1718-FULL Approval

RE: IRB Review

IRB No.: 050-1718-FULL

Project: Fire Safety Simulation Games for Children: A Toolkit

Date Complete Application Received: Revision first discussed at 2/7 Meeting

Principle Investigator: Carie Anderson

Faculty Advisor: Dayna Herrera

College/Department: College of Nursing (CoN)

IRB Determination: Full Board Application Approved – Student research using anonymous survey questionnaires and simulated fire activity; minor participants; risk appropriately mitigated; no deception utilized; acceptable consent and assent procedures and documentation; acceptable data protection procedures. Data collection may begin, in accordance with the final submitted documents and approved protocol.

Future Correspondence: All future correspondence about this project must include all PIs, Co-PIs, and Faculty Advisors (as relevant) and reference the assigned IRB number.

Approval Information: Approval is granted for one year from date below. If you would like to continue research activities beyond that date, you are responsible for submitting a Research Renewal Request with enough time for that request to be reviewed and approved *prior* to the expiration of the project. In the case of an unforeseen risk/adverse experience, please report this to the IRB immediately using the appropriate forms. Requests for a change to protocol must be submitted for IRB review and approved prior to implementation. At the completion of the project, you are to submit a Research Closure Form.

Researcher Responsibilities: The researcher is responsible for ensuring that the research is conducted in the manner outlined in the IRB application and that all reporting requirements are met. Please refer to this approval and to the IRB handbook for more information.

Date: March 13, 2018

IB

Institutional Review Board

Reply all

Tue 3/13, 2:44 PM

Carie Alise Anderson;

Dayna Herrera;

Institutional Review Board

Inbox

You forwarded this message on 3/15/2018 7:11 PM

RE: IRB Review

IRB No.: 050-1718-FULL

Project: Fire Safety Simulation Games for Children: A Toolkit

Date Complete Application Received: Revision

first discussed at 2/7 Meeting

Principle Investigator: Carie Anderson

Faculty Advisor: Dayna Herrera

College/Department: CoN

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Date: March 13, 2018

Appendix I

DM

DOUBLET MARY <mary_doublet@cjud.net>



Reply

Mon 11/13, 1:16 PM

You

Inbox

This message was sent with high importance.

Hello Carie,

Great News!

We got the response from our Liability Insurance Provider and they your project is good.

There is a stipulation- adult supervision is recommended - the ratio is 1 to 8 (1 adult to every 8 children).

Once CBU has given you the final green light we can work out the logistics with the school site to move forward.

If you have any questions, please don't hesitate to call me.

Best regards,

Mary Doublet

Risk Manager

Colton Joint Unified School District

Risk Management and Health Benefits

Phone 909.580.6618 • Fax 909.433.9469

-Coming together is a beginning- Keeping together is progress – Working together is SUCCESS -

`Statement of Confidentiality: The contents of this e-mail message and any attachments are intended solely for the addressee. The information may also be confidential and/or legally privileged. This transmission is sent for the sole purpose of delivery to the intended recipient. If you have received this transmission in error, any use, reproduction, or dissemination of this transmission is strictly prohibited. If you are not the intended recipient, please immediately notify the sender by reply e-mail and delete this message and its attachment, if any. E-mail is covered by the Electronic Communications Privacy Act, 18 USC SS 2510-25821 and is legally privileged.

Appendix J

Mobile Simulation Laboratory Door Assembly Instructions

<u>Shopping list</u>
<input type="checkbox"/> 1" PVC- 5' lengths, 6-7 pieces
<input type="checkbox"/> 3/4" PVC- 5' lengths, 6-7 pieces
<input type="checkbox"/> 1" elbow joints-
<input type="checkbox"/> 1" T-joints
<input type="checkbox"/> 1" coupler joints
<input type="checkbox"/> 3/4" elbow joints
<input type="checkbox"/> 3/4" T-joints
<input type="checkbox"/> 3/4" coupler joints
<input type="checkbox"/> PVC glue and/or white or clear duct tape
<input type="checkbox"/> PVC cutter pliers (Cuts 1" PVC)
<input type="checkbox"/> Cabinet knob to attach to door to simulate a doorknob
<input type="checkbox"/> Parachute fabric (or some light-weight fabric) to cover door front
<input type="checkbox"/> A pocket for the heat/cold packs
<input type="checkbox"/> Glue gun
<input type="checkbox"/> Glue sticks

It would be advisable to utilize a skilled construction individual to assist with the door assembly. The finished door will measure approximately 6.5 feet tall and be positioned on the inside of the E-Z up tent, secured with clamps, zip ties, or even duct tape. The door should open

inward, the same as a bedroom door. The optimum size door is approximately 30-32” wide. Spray paint the PVC, if desired. Special care should be used when constructing the door joint, which slides into the larger PVC pipe, as this provides the door hinge. Space should be created along the door bottom to allow for the simulated smoke to escape.

1.	<ul style="list-style-type: none"> ▪ If you do not have access to a truck or van, it is best to make the door collapsible, so it easily fits in the back seat of a Honda Civic or similar sized vehicle. ▪ You will need coupler joints to reattach the door once you reach your destination.
2.	<ul style="list-style-type: none"> ▪ In order to easily visualize the layout, construct door on the floor. ▪ You will need a door and door frame. The door pieces will be the same lengths on both sides. ▪ After the frame is construction is completed, glue the fabric to the door frame, pulling it snug. You can put fabric on one or both sides.
3.	<ul style="list-style-type: none"> ▪ Tape, glue, or sew the pocket to the door to hold the hot/cold packs or make a slit at the bottom of the door. (See the photo of the miniature display door next to the collapsible door).

Appendix K

FSFC Training Module for Teachers/Volunteers	
Per the Colton Joint Unified School District, there must be one adult supervisor for every eight children. Check with your school district for current ratio regulation.	
After the initial introduction of event, the pre-quiz is given. It should be read aloud for those who may have reading difficulties.	
A pre-briefing of the FEMA-based scenarios should be presented after the pre-quiz. Each scenario lasts about 30 seconds. After reviewing the FEMA-based scenarios, line the children up in groups of 6-8 and perform a walk-through of all three mobile simulation laboratories. For further instruction refer to the Simulation Toolkit.	
<p>There should be:</p> <ul style="list-style-type: none"> • one adult in each tent • one-two adults lining the students up • one adult manning the smoke machine (fog machine) • one adult by the exit window to prevent tripping or injury when the children exit the low-threshold window, which is approximately 12 inches off the ground. • There should be three smoke machines, one for each tent. • Any child with asthma should cycle through the stations first and if they experience any breathing difficulties, they can cycle through the scenarios without the smoke machines. It was tested on an adult with asthma and they experienced no breathing problems. 	
This entire skills process should take about 90 minutes 100 students through six stations. If time permits, the students may cycle through the scenarios a second time.	
The simulation activity debriefing should take place after all the children have completed the cycle. The children should be instructed to perform a home fire safety drill with their parents. Questions, concerns, suggestions and feedback should be encouraged and welcomed from all participants. Appropriate modifications should be made or future events.	
One week later a post-quiz should be given, and additional feedback and debriefing received, if needed.	

Appendix L

FSFC Event

Session Agenda

Welcome	School District Officials, Fire Safety Educators, Teachers/Volunteers		
Event Agenda	90 minutes		
Purpose for the DNP project	To save children’s lives and help them safely exit a home during a smoke or fire event	Introduce firefighter educator and stakeholders	Check the smoke alarm to make sure it is working; remind parents to check the alarm
Pre-quiz – 10 questions	Remind them to use their own answers	Review answers	
Simulation Activity	Instruct students what to expect in the mobile simulation laboratories	Cycle through the three mobile simulation laboratories to complete the three scenarios	Remind students that if they are scared or uncomfortable, they can stop or leave at any time, or if they feel the need for help
	a. Crawl out of the house after alarms go off, check door with back of hand for heat	b. Smoke, too much smoke, door hot, crawl out window, (window will be a low height so step out instead of crawling out)	c. Apartment (Or second story home) no way out, door is hot, shove blanket under door to stop smoke, hang white towel in window, wait for fireman to rescue
Debriefing	Post-quiz, questions, why we need them to do the survey in 3 months	Conduct fire drill (to be completed with parents)	

Appendix M

Pre-Quiz / Post-quiz for Fire Safety in the Home	
1. If fire gets on your clothes, what should you do?	
	<ul style="list-style-type: none"> a. Stop, Drop, and Roll b. Run for help c. Jump up and down d. Stand still and wait for rain
2. If the smoke alarm in your home begins to sound, what should you do?	
	<ul style="list-style-type: none"> a. Put on ear muffs b. Pull out the batteries c. Turn up the volume of the TV d. Go to the nearest exit, leave the house and go to your meeting place
3. Do you have a written home fire escape plan?	
	<ul style="list-style-type: none"> a. Yes b. No
4. When should you and your family practice “Fire Escape Drills” at your house?	
	<ul style="list-style-type: none"> a. Only in October b. Only if you are planning to have a fire c. At least twice a year d. Never
5. During a fire, what should you do before opening any closed door?	
	<ul style="list-style-type: none"> a. Knock to see if anybody’s home b. Check the door for heat with the back of your hand c. Kick the door down d. Huff and puff and blow the door in

6. What should you do if you see any smoke, while you are exiting your house?
a. Run through the smoke b. Look for a huge fan c. Drop to your knees and crawl out below the smoke, (where the good air is) get out, and stay out
7. When your family is planning your primary and secondary exits for your home fire escape route plan, you have to make sure that:
a. You identify at least two ways out of each room in your house b. You leave a trail of breadcrumbs to find your way out c. You paint a stripe on the floor to follow d. Set up traffic cones, barrels and flashing lights
8. When burning candles, which rules should you always follow?
a. Burn candles inside a circle of safety, a one-foot area around the candle free of anything that can burn b. Keep out of reach of children and pets c. When you're out, blow out; never leave candles burning in a room unattended d. All of the above
9. Do you think about the possibility of fire in your home?
a. Yes b. No
10. If you forgot the dog or the cat, should you go back in and get the dog or cat?
a. yes b. no
If you feel uncomfortable with any question, you may leave it blank

Appendix N

SCENARIOS (FEMA EVIDENCED-BASED)

There are three simulation scenarios;

- A. Crawling out of a house to a safe meeting place, after checking the door to see if it is hot.
- B. No safe exit at door due to heat felt and exiting by a window if unable to exit through a door.
- C. A second story apartment, unable to exit, stuff blankets under door, hang white towel in window, and wait for rescue.

Appendix O

Simulation Laboratory Room Configuration and Skill Process	
1.	The mobile simulation laboratory (E-Z Up tent) door is made of PVC pipe and parachute material, is collapsible and compact enough to be transported in a Honda Civic or similar-sized vehicle. The door has moveable parts that allow the door to open and closed when attached to the E-Z Up tent. The door has a pocket in which to place a hot pack to simulate a hot door indicating fire danger. There are two windows in the tent. Each of the tent stations is decorated in a children’s theme to simulate a child’s bedroom.
2.	There are three mobile simulation laboratories that offer a different scenario in each tent. Divide the children into groups of 6-8 for each station. They will watch three scenarios then act out three scenarios at each of the stations.
3.	The safety tree is an inflatable palm tree approximately 20 feet away from the tents to simulate running to a safe meeting spot in the event of a real home fire. Each time a scenario is run, the smoke alarm is sounded for all three tents simultaneously, and the children act out the task assigned per tent. The smoke alarm is triggered right after the smoke machines are activated. After the task is performed, they are instructed to run to the safety tree.
4.	The first station, a dark blue tent, is decorated with a “Star Wars” theme. When the smoke alarm is sounded, the students are instructed to roll out of bed, crawl to the door and check the door with the back of their hand. If the door was not hot, they could crawl out the door. This door was not hot where the pocket was located so they could proceed out the door.
5.	The second station, a light blue tent, is a bedroom decorated with a “Frozen” theme. One low-threshold window (approximately one foot off the ground), has a special Velcro attachment to allow the children to escape after they crawl, check the door, and find it to be hot when they touch it with the back of their hand. They then escape out of the window, where padding and a volunteer are located to prevent tripping or injury.
6.	The third station, a white tent, is decorated like a living room, with inflatable sofas and chairs and two windows that do not open. The scenario simulates being in an apartment building where escape out of the front door is blocked due to smoke or fire. This scenario requires the children to stuff blankets under the door because smoke is coming

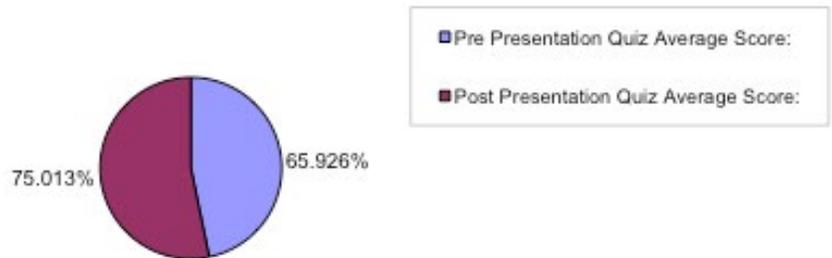
in and they cannot escape the apartment building. They need to hang a white towel in the window to signify they are waiting for rescue from firemen per FEMA and NFA guidelines. When the children have completed the scenario exercise properly, the teachers/volunteers allow the children to exit and run to the safety tree.

7. When the children finish watching all the scenarios, they then act out all the scenarios and run to the safety tree each time until they have completed the cycle of six stations.

Appendix P

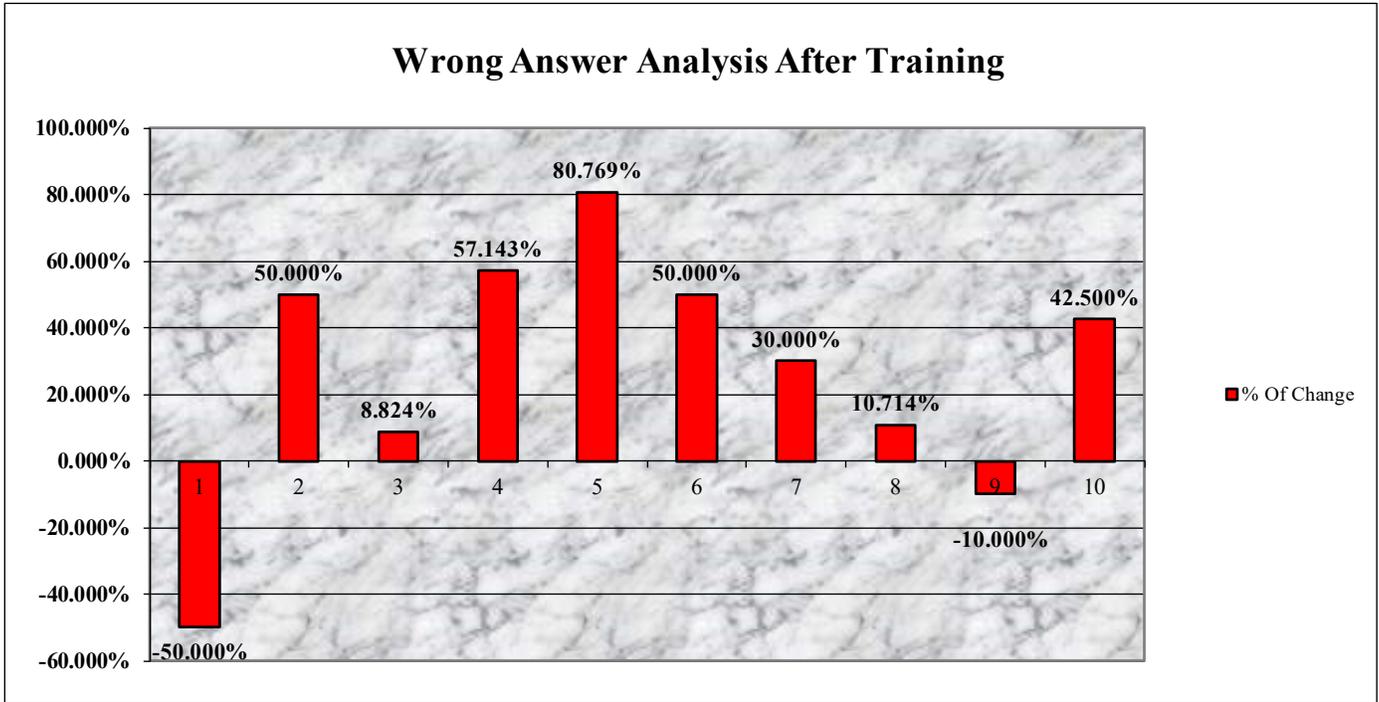
Pre Presentation Quiz Average Score: 65.926%		Wrong Answer Analysis							
Post Presentation Quiz Average Score: 75.013%		Most Missed Pre Presentation Quiz Questions:	Most Missed Post Presentation Quiz Questions:	Pre quiz	Post quiz	Difference	% Of Change		
Total Improvement/Regression: 9.087%		10	3	1	2	3	-1	-60.000%	
		3	8	2	2	1	1	50.000%	
		8	9	3	34	31	3	8.824%	
		5	10	4	14	6	8	57.143%	
		9	7	5	26	5	21	80.769%	
		4	4	6	4	2	2	50.000%	
		6	5	7	10	7	3	30.000%	
		1 & 2	1	8	28	25	3	10.714%	
			6	9	20	22	-2	-10.000%	
			2	10	40	23	17	42.500%	

Fire Knowledge Improvement Breakdown



Sample Size Requested:	105
Persons consenting to be in Project Sample:	74
Sample Size actually available:	54
T Test Variance: #VALUE!	
No# of Fire Safety Presentations:	1

Appendix Q



Appendix R

Resource Budget

FSFC-5 Year Budget

REVENUE	2017	2018	2019	2020	2021
Cash (in-kind donation)	\$ 750	\$ -	\$ -	\$ -	\$ -
Petty Cash	\$ -	\$ 100	\$ 300	\$ 200	\$ 200
Donations/Fundraisers (etc.)	\$ 481	\$ 407	\$ 521	\$ 609	\$ 1,956
TOTAL REVENUE	\$ 1,231	\$ 507	\$ 821	\$ 508	\$ 2,156
EXPENSES	2017	2018	2019	2020	2021
VARIABLE					
Advertising (free: flyers sent home from school)	\$ -	\$ 25	\$ 35	\$ 35	\$ 45
Meetings Refreshments	\$ 40	\$ 40	\$ 80	\$ 60	\$ 60
Use of Venue (No cost)	\$ -	\$ -	\$ -	\$ -	\$ -
Miscellaneous Expenses	\$ 25	\$ 25	\$ 25	\$ 25	\$ 25
TOTAL VARIABLE EXPENSES	\$ 65	\$ 65	\$ 65	\$ 65	\$ 65
FIXED					
PVC Pipe and door supplies	\$ 90	\$ -	\$ -	\$ -	\$ -
Supplies for Mobile Sim Lab	\$ 475	\$ 120	\$ -	\$ -	\$ 475
E-Z Up (can vary between \$100-300)	\$ 138	\$ -	\$ -	\$ -	\$ 150
Supplies (fasteners, duct tape, clamps)	\$ 20	\$ 20	\$ 30	\$ 30	\$ 30
Paper products/golf pencils for survey	\$ 50	\$ 50	\$ 60	\$ 60	\$ 71
TOTAL FIXED EXPENSES	\$ 170	\$ 190	\$ 90	\$ 90	\$ 726
TOTAL EXPENSES	\$ 235	\$ 255	\$ 155	\$ 155	\$ 791
Operating Margin	\$ 996	\$ 252	\$ 666	\$ 353	\$ 1,365
*Other Assets on Hand					
	<u>Value</u>				
1) Bullhorn (optional)	\$ 40				
2) 20 Metal Folding Chairs (optional)	\$ 240				
3) 3 Folding Tables (optional)	\$ 120				
4) Computer	\$ 550				

consider grant funding in year 2

Appendix S

FSFC Event Checklist

- 10 x 10 E-Z Up tent with side panels and at least one window panel
- Window panel (with window that opens for E-Z Up tent)
- Door- constructed of PVC pipe and parachute cloth for each tent
- 2 beds- per room (camping cots work best)
- 1 carpet-10 x 10 per room
- 2 bedspreads-per room
- Weight lifting interlocking pads to place outside window (to avoid injury)
- Duct tape
- Clips (for securing items that might blow in the breeze)
- Possible themed laundry hamper (comes in handy for hiding things during event)
- White towel to hang in window during apartment scenario
- Smoke machine juice
- Smoke machine (fog machine)
- Fire signs such as, “Crawl out, get out, stay out”, “Two ways out”, and “Is the door hot?”
- Smoke alarm
- Bull horn
- Pre-quiz and post-quiz
- Clipboards
- Pencils

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