Leading Community Risk Reduction

Elementary school public safety education curriculum for Roanoke Fire-EMS.

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Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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Abstract

The problem was the Roanoke Fire-EMS Department experienced inconsistencies in the delivery of the public safety education curriculum to elementary school children. Personnel from the Operation’s Division were frequently assigned to visit schools and deliver a safety presentation to children. Personnel were not prepared or provided any type of standardized risk reduction curriculum to deliver. Personnel presented a wide variety of information to the children with no consistency from one presentation to another. Many personnel were unable to effectively communicate with the children due to age differences. The purpose of this research project was to develop a uniform risk reduction safety curriculum for delivery by Operation’s personnel. Action research was used to identify local problems and develop the risk reduction curriculum.

Research questions included: a) What safety messages are appropriate for elementary schools? b) How should the program be delivered to students? c) How to evaluate the risk reduction curriculum? d) How will field personnel be trained to deliver the safety message? e) Is it cost effective to have Operation’s personnel perform risk reduction in public schools?

Procedures included a literature review, review of department information, review of current department curriculum, and review of state SOL educational requirements and consultation of department Fire Marshal, Public Education Specialist, and personnel from related local agencies.

Results included the need for delivering a uniform message to address the most frequently occurring injuries and causes of fires involving local children and the development of a curriculum to educate children on prevention procedures. Recommendations included the development of a basic lesson plan, preparing Operation’s personnel to delivering risk reduction presentations and the evaluation of the curriculum.
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Introduction

Today’s fire departments must provide more than just typical fire and EMS response services in order to carry out the department’s mission. Many departments have adopted the mission of saving lives and protecting property. Some even address the potential for mitigating disasters and hazardous materials incidents. The mission must also include not only code enforcement and investigation services, but also a strong focus on prevention of fire incidents and injuries due to improper behavior. This means taking a more proactive attitude and educating the community on the issues affecting them such as the threat of fire, accident prevention, and simple health related topics.

The Roanoke Fire-EMS Department exists to protect and preserve the lives and property of residents and visitors of the City of Roanoke from damage or loss due to fire, medical emergencies, environmental hazards and traumatic accidents. Roanoke Fire-EMS provides state of the art fire, EMS, hazardous materials response, and technical rescue response capability. The department also provides fire investigation and code enforcement through personnel trained and dedicated to those tasks.

Public fire education is coordinated by the public information officer (PIO), in conjunction with Operation’s Division personnel. The PIO coordinates educational activities with local schools and schedules Operation’s personnel to make presentations to school children. This is done on a regular basis throughout the year. The problem is that inconsistencies are frequently being experienced. Inconsistencies occur when Operation’s personnel make presentations without any prior training or preparation. Currently, Operation’s personnel are not trained or prepared to deliver presentations to school children and there is no uniform curriculum being utilized. Operation’s personnel are not instructed on what safety messages to deliver.
Many personnel are not trained in instructional techniques or provided a lesson plan to go by. The individual presentations wind up being made off the cuff. Children are taught safety messages ranging from stop, drop, and roll, the functions of a self contained breathing apparatus, to the advantages of the two stage fire pump. The presentations are thus, inconsistent.

The purpose of this project was to develop a standard risk reduction curriculum that could be used by Operation’s personnel to deliver to children and eliminate the inconsistencies that are occurring. The author utilized action research to develop a standardized curriculum for delivery to children. The following research questions were developed to collect information that could be used in the development of the curriculum: a) which safety messages are appropriate for elementary schools? b) How should the program be delivered to students? c) How will Operation’s personnel be trained to deliver the safety messages? d) How to evaluate the risk reduction curriculum? e) Is it cost effective to teach risk reduction in public schools?

Background and Significance

The City of Roanoke, Fire-EMS Department provides ministerial and discretionary fire-rescue services to a diverse population of approximately 94,000 citizens within a 43 square mile area. There are approximately 270 full time employees. The department operates out of twelve strategically located fire-EMS stations. All Suppression Division personnel work rotating twenty-four hour shifts. Each day the fire-EMS department staffs 11 engine companies, four aerial truck companies, seven advanced life support (ALS) medic units, and an Emergency medical service (EMS) supervisor, all of which are supervised by two Battalion Fire Chiefs on three rotating work shifts. Each engine company and aerial truck company has four personnel assigned and operates with a minimum of three. Each medic unit has two personnel assigned with at least one being an ALS provider.
All new recruits are required to attend the Fire-EMS Academy before being placed in a fire-EMS company. The recruit academy lasts approximately 16 weeks. During the academy new recruits receive basic instruction on various fire and emergency medical service topics which includes an awareness of public education.

Currently, Operation’s personnel are scheduled by the public information officer (PIO) to visit schools in their response districts and provide presentations geared towards fire safety. Due to the lack of a standardized risk reduction curriculum and proper training, Operation’s personnel visit the various schools and talk to children about a wide variety of topics without any consistency from one school to another. Some children are taught to stop, drop, and roll if their clothes catch on fire, other children are instructed to dial 9-1-1 in case of a fire, and others receive a demonstration of the equipment and its firefighting capabilities.

While this is interesting to many of the children, there is a different message being taught from one school to another and from one class to another. The result is missed opportunities to provide consistent information that can be used by the children in reducing fires and injuries. The department has over twenty fire companies that could go out to schools and deliver a solid, consistent safety message. On a national level, nearly 600 children under the age of 15 were killed as a result of fires in 2001 (United States Fire Administration, 2008). If the current program continues, the rate of fires and injuries being incurred will continue to either remain the same or possibly increase.

This research project is linked to the Executive Fire Officer Program course Leading Community Risk Reduction in that the intention is to identify the most common occurring risks to children in the community and develop a standard curriculum that Operation’s personnel can deliver to public school children. This will ensure consistency in the lessons being delivered
toward the reduction of fires and injuries occurring to children. The project ties into multiple United States Fire Administration’s operational objectives by targeting school aged children, reducing fire incidents that lead to firefighter casualties, educating the public to the local hazards, and using current local data to detect trends. The program would assist in: a.) Reducing the loss of life from fire from ages 14 and under, b.) Reducing loss of life from fire of firefighters, c.) Promoting within communities a comprehensive risk reduction plan led by the fire service organization, and d.) Responding in a timely manner to emerging issues.

This can be accomplished because elementary school children aged 14 and under will be the target audience, with a reduction of fire incidences there will be less exposure to the hazards of fires meaning a reduction of firefighter injuries and fatalities, the department will be taking a proactive stance in educating the community about risk reduction, and the department can incorporate current local data into the curriculum to address emerging trends and maintain a curriculum that reflects current local data.

Literature Review

The purpose of this literature review was to explore the findings of other authors who have conducted research in similar topics that will assist in answering the research questions for this applied research project: a) Which safety messages are appropriate for elementary schools? b) How should the program be delivered to students? c) How will Operation’s personnel be trained to deliver the safety messages? d) How to evaluate the risk reduction curriculum? e) Is it cost effective to have Operation’s personnel perform risk reduction in public schools?

Fire prevention has long taken a back seat to fire suppression activities. According to America Burning (1973) at that time about 95 cents of every dollar spent on the fire services was used to extinguish fires, only about 5 cents was being spent on other efforts such as fire
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prevention, inspections, and public education. That philosophy has begun to change. Public education is now becoming more prevalent in today’s fire service. “Fire and life safety education is receiving more recognition than ever before by the fire services of North America” (Robertson, 2005, p. 38). Fire safety education has finally been made of priority of today’s fire service activity. “Fire safety education, which started in the 1970’s, has now become part of many of our nation’s schools and fire departments” (Smeby, 2006, p. 7).

Most fire departments provide some level of prevention activity in an effort to reduce the loss of life and property. This may be required as part of the city or county charter. Prevention activities are usually delegated to personnel specifically trained in the various areas of prevention. These efforts include various components such as inspections, investigations, code enforcement, and public education. “Effective fire-prevention programs are traditionally based on the following four elements: 1.) engineering, 2.) inspections, 3.) investigation, and 4.) education” (IFSTA, 2004, p. 353).

Public fire and life safety education should be seen as the cornerstone of an effective fire prevention program. More focus should be directed towards prevention activities in the form of budget funding and personnel dedicated to performing the work, especially public education. “Among the many measures that can be taken to reduce fire losses, perhaps none is more important than educating people about fire” (America Burning, 1973, p. 105).

If the public could be educated in the behaviors that cause fires and other accidents, many fire related incidences could be avoided. If the incidences of fire could be reduced, there would likely be a reduction in the rate of injuries and fatalities to children and to the firefighters that respond to them. The prevention of fires due to human carelessness is not all that fire safety can
hope to accomplish. Many fires caused by faulty equipment rather than careless behavior could be prevented if people were trained to recognize hazards (America Burning, 1973).

Efforts to reduce fires and other emergencies should include an analysis of local data so that efforts can be directed to the issues unique to that jurisdiction. This is a critical component of public education, educating people on the hazards they may be exposed to. The best way to fight a fire is to prevent it from happening in the first place (Cyr & Johnson, 2006).

In order to determine what safety messages to include in a fire and life safety curriculum that is appropriate for elementary schools, a planning process must be conducted. A risk reduction program should cover a variety of topics. “In addition to fire safety, many other safety concerns are included in these programs such as vehicle accidents, pool and water safety, and other common accidents that cause injuries and deaths” (Smeby, 2006, p. 8).

To determine the most common community hazards of the locality, there are various planning models that can be used to determine the risk and create a curriculum to address the identified risks. The International Fire Service Training Association (2004) outlines a five step planning process: 1) Identify the safety hazards in the service area, 2) Select the most effective and efficient solutions to the hazards, 3) Design the most effective means of delivering the programs elements to the service area, 4) Implement the program message to the audience, and 5) Evaluate the effectiveness of the program (Appendix A).

There are multiple hazards that can be included in a risk reduction curriculum. The main types of hazards to be covered should include a.) What to do in the event of a fire or other emergency, b.) How to prevent a fire or emergency from occurring, and c.) How to persuade others to use fire or life safety behaviors (IFSTA, 2007).
The International Association of Fire Chiefs (IAFC) and United States Fire Administration (USFA) jointly developed the Risk, Hazard, and Value Evaluation (RHAVE) program for use by local policy makers for the collection of useful information and data regarding the identification and assessment of fire and safety related risks within their communities or service areas (IFSTA, 2004). The information collected through RHAVE can be used to develop objectives and policies to address the identified risks.

Although national level information is helpful in determining the national risks, it is not as helpful in determining the local hazards. Information involving the local risk related problems should come from the local community in order to have the most effective result. “A community analysis is a process that identifies fire and life safety problems and the demographic characteristics of those in a community” (Robertson, 2005, p. 39).

A risk reduction curriculum should target child accident related injuries. Each year, unintentional injuries kill more than 6,000 kids and permanently disable more than 120,000 (NFPA, 1998). An injury awareness component within a risk reduction curriculum could assist in reducing these rates of deaths and injuries.

A thorough risk reduction curriculum should consist of more than just fire related safety messages. There are current curriculums that cover more than fire prevention. The Safe Kids Campaign, through state and local chapters, promotes bike safety, child vehicle occupant safety, and general injury prevention as well as burn prevention and safety (Robertson, 2005).

Local data can be utilized to answer a series of questions designed to identify the local problems: a) What are the major fire and burn hazards, b) Where are the high risk locations, c) What are the high risk times, d) Who are the high risk audiences, e) What is the high risk behavior (IFSTA, 2007).
The risk reduction program can be delivered in a variety of methods. Using on duty personnel to present the risk reduction program to a group of school children is one way to facilitate the program. Group presentations allow for a way to learn about the people in the community and are a win-win situation because fire personnel get a chance to understand the community members and take part in public relations as the same time. (IFSTA, 2007).

Utilizing the local media outlets can aid in establishing a professional relationship between the media and the fire service organization. News and media programs help increase the public’s awareness while enhancing the organizations public image. As a condition of their operating licenses, broadcast media in the U.S. are required to set aside a certain amount of time for public service announcements (IFSTA, 2007).

Field personnel can directly influence the public about issues concerning fire and life safety. Firefighters are viewed as the professionals. Firefighters are viewed as experts in fire and life safety. The public relies on them for information with safety related issues (IFSTA, 2007).

At the company level, firefighters can play a duel role. Firefighters respond to emergency calls and also can be used to educate the public on how to react to emergencies and prevent them from happening. In fire and emergency services organizations that are not large enough to have a full time public education staff, on-duty company officers and their subordinates can be used to develop and deliver these programs (IFSTA, 2007).

Because of their close contact with the community, company level personnel can provide input that is very useful in developing program goals and objectives that target the most pressing needs within their community and focusing program delivery on the most appropriate group or groups. (IFSTA, 2007).
A risk reduction program may consist of various elements or messages. “The messages should show the context of the problem and desired behavior. This helps explain the problems to the public. The format, whether it be a wall chart, video, PowerPoint, or folder, should be matched to the message, audience, and resources” (Robertson, 2005, p. 40).

The program needs to be of an appropriate duration so as to sufficiently provide the information to the audience, but not overload them with too much information. “The planner should determine the appropriate delivery time by specifying the target groups and finding out when those audiences will be most receptive to fire and life safety messages” (Robertson, 2005, p. 40).

It is critical that personnel conducting public education program utilize a standard, uniform curriculum when making presentations. Otherwise, the intended message may not be understood by the target audience. “Fire prevention personnel have sometimes misdirected training efforts by not considering the learning and comprehension abilities of the students being taught” (Robertson, 2005, p. 4).

Personnel presenting the safety material need to understand how to connect with the target audience. Each audience will require a slightly different approach. The learning style of the group must be understood for the presentation to be effective. Teaching children requires a different approach than teaching adults. The learning process of children is referred to as pedagogy. “It is the principle of learning most often associated with children” (IFSTA, 2006, p. 137). Dealing with older adult students is somewhat different than dealing with children. Teaching adult students is known as andragogy. “Andragogy describes the characteristics of adult students and provides a set of assumptions for most effectively teaching adults” (IFSTA, 2006, p. 138).
Personnel must understand the principles of pedagogy and andragogy so that they can be more effective in transferring the information to the students. The “self concept” means that children have a greater dependency for their learning style. “Because children lack experience, they depend on others for knowledge and must be directed” (IFSTA, 2006, p. 138). Once the children reach adulthood, they become more self sufficient for their learning needs.

Adults have the advantage of utilizing their past experiences to relate new information. This concept is called “known to unknown”. Teaching children requires the instructor to make sure the material is completely understood before moving on in the lesson. “Children learn those skills that allow them to move from one developmental phase to the next” (IFSTA, 2006. p. 138).

According to retired Fire Chief Tom Fuqua, on-duty personnel can be trained and certified as Fire Instructor 1. This will enable them to deliver a prepared presentation using basic public speaking techniques (personal communication, April 1, 2008). The current Fire Instructor 1 is a 32 hour course which is taught over the span of three weekends. Instructor candidates are required to deliver multiple presentations that are critiqued and the candidate is provided tips for improvement. The Instructor curriculum includes information on psychomotor, affective, and cognitive learning domains. “Successful education programs raise the cognitive levels of understanding and motivate the audience to take action based on that information” (Crawford, 2002, p. 70).

According to Fuqua, the Virginia Department of Fire Programs offers a short training program that teaches firefighters how to effectively communicate with children (personal communication, April 1, 2008). The program lasts four hours and is offered throughout the Commonwealth (Appendix E). The program is called “Communicating with children”. The program instructs ways to teach children. Firefighters can be trained to make public education
presentations by attending the “Communicating with children” course. This will assist in making
sure an appropriate level of instruction takes place.

The “Communicating with children” course instructs personnel how to effectively select
appropriate safety information and materials for delivery to children ages 3-14 years of age. The
four hour course is designed for personnel with no prior training in public education (personal
communication, April 1, 2008).

Fire and life safety messages can be incorporated into other lesson plans. Fire and life
safety information could be blended into other lessons for targeted specific grade levels. Each
grade in the Virginia Public School System has a series of Standards of Learning (SOL’s) that all
students must successfully achieve at each grade level. The SOL’s for Virginia Public Schools
describe the Commonwealth's expectations for student learning and achievement in grades K-12
in English, mathematics, science, history, and social science, technology, the fine arts, foreign
language, health and physical education, and driver education (Appendix C).

The Commonwealth of Virginia SOL’s contains a block of instruction targeting fourth
grade children involving personal safety and community health. Section 4.6 covers the student’s
role in solving community health problems. This would be an ideal point to incorporate fire
safety messages. Section 4.7 covers communicating with family members concerning the
importance of personal and community health issues. Fuqua stated children could be taught
safety messages and then they could in turn take those messages home to their families (personal
communication, April 1, 2008).

The National Fire Protection Association Risk Watch program covers 8 core
topics: 1) Motor vehicle safety, 2) Fire and burn prevention, 3) Choking, suffocation, and

Firefighters can be trained to deliver the risk reduction program in a variety of methods. There are courses available to train personnel how to deliver a risk reduction curriculum. “The National Fire Academy has developed a number of courses that provide training for potential public fire and life safety educators” (Crawford, 2002, p. 70).

These courses outline the differences between public information and educational strategies. The elements that comprise the foundation of education include the cognitive, affective, and psychomotor learning domains. When related to educational efforts, these learning domains can be viewed as a progression of the depth in understanding an audience must achieve if they are to act on the information (Crawford, 2002).

It would be beneficial to have personnel undergo instructor training and become certified as Instructors. This will assist in them having a greater understanding of learning levels. Upon receiving Instructor, personnel will be better prepared to deliver a prepared lesson plan to children and not have to worry about what topics to cover. They will simply deliver a message that has been developed specifically for the age group being targeted. This will help ensure consistency in the messages being delivered. “There is no question that a consistent, positive program of active learning experiences, reinforced over time, is much more beneficial than a once a year tell them everything you know presentation” (Robertson, 2004, p. 44).

Once a risk reduction program is implemented, an evaluation must take pace to determine if the goals are being achieved by the program. Each component of the program must be evaluated to make sure that the local problems are being correctly identified and addressed, the
target audience has been identified and are personnel being properly prepared to deliver appropriate safety messages to children.

A successful program will show a reduction in the rate of fires and injuries. The program must demonstrate a benefit to the community for it to be allowed to continue. Local decision makers are facing more pressure to justify expenses for every type of government service. Concerned taxpayers want to know the outcome produced by their tax dollars and whether programs are managed efficiently (Crawford, 2002).

An evaluation will highlight areas of the program that are meeting the established goals and will also show areas that are not being met. This is also a good time to incorporate new material related to emerging trends detected within the locality. “Prevention programs are the most difficult to evaluate, though most accept the concept that preventing an incident is cheaper than dealing with it after the fact” (Crawford, 2002, p. 12). It is difficult to determine whether or not a fire or injury was prevented by something learned in a risk reduction program. A comparison of statistics may show an increase or decrease in the occurrence of fires or injuries from one year to another, but it is difficult to quantify how many actual structure fires did not occur because of the behavioral lessons learned from a program. “In most cases it is very difficult to measure benefits or direct outcomes from fire and emergency services programs” (Smeby, 2006, p. 57).

There are various ways of evaluating fire and life safety prevention efforts that work very well within a specified jurisdiction. The following are a list of areas that can be measured: a) Work load: amount of work conducted, per inspections or presentations delivered, b) Efficiency: if something is done quickly and at the lowest possible cost, c) Effectiveness: produce the most solid results to policy makers, are results in line with stated goals, d)
Benchmarks: comparative analysis, one jurisdiction against another or to itself, and e) Setting goals and then seeing if you are meeting them. This is a popular method because it allows decision makers to compare against other departments. (Crawford, 2002).

To identify the local risks, personnel can utilize data from the departments run reports. Each report for fire and emergency medical services gathers various types of pertinent information that can be analyzed. “The purpose of these incident reports is to help define the “who, what, when, where, and how” of fires and other injuries so that they can be prevented” (Crawford, 2002, p. 113). This type of analysis helps determine the local problems.

Rhett Fleitz, Fire Investigator for Roanoke Fire-EMS Department, stated the most common causes of local fires involving children are cigarette lighters and matches. Fleitz further stated 20% of child fire victims died in fires they started themselves and lighters and matches were used in 80% of the fires started by children (personal communication, April 22, 2008).

Local hospitals are another important source of information that can be used to determine the local problems being faced by the community. Hospitals track data concerning injury frequency rates and types involving children. “Hospital, census, and school records may help more closely define the specific demographics of potential audiences for prevention efforts” (Crawford, 2002, p. 113).

According to Jill Lucas, Carilion Community Health Educator Coordinator, the most common causes of injuries to children locally are: 1) Falls, 2) Motor vehicle crashes, 3) Sports related injuries, 4) Overexertion, 5) Poisons, and 6) Cutting instrument injuries. (personal communication, April 20, 2008).

“Programs should be constantly monitored and modified on the basis of the monitoring review” (Robertson, 2005, p. 40). The program should be evaluated to ensure that goals are
being met and to detect possible trends that are occurring. This allows for program designers to meet one of the United States Fire Administration’s operational objectives: to appropriately respond in a timely manner to emergent issues.

The cost effectiveness of having suppression personnel perform risk reduction in public schools can be viewed in many ways. One obvious benefit is the positive public relations that are generated by fire-EMS departments being proactive instead of only being reactive in regard to the community’s problems. “While there are other ways to enhance the department’s image, the means most often used by fire and emergency services organizations is public education: one of the most cost effective safety activities of any fire and emergency organization” (IFSTA, 2004, p. 233).

It is difficult to demonstrate that a certain number of injuries or fires were prevented by a risk reduction program. How can it be quantified that prevention efforts are worth the funds directed towards a prevention program. “Can a dollar value be assigned to a person’s life or quality of life” (Smeby, 2006, p. 57). Can it be shown that an injury is prevented for every dollar spent? In many cases, citizens do not realize that their behavior has saved them from losses from fires. “The beneficiaries of a comprehensive prevention program in many cases do not even know that they have been saved or property loss has been averted” (Smeby, 2006, p. 100).

Money allocated to prevention efforts could lead to a reduction in losses caused by fires and accidents. The goal should be to educate the Operation’s personnel to gain an understanding that it is better to prevent the incident rather than respond to one. “The best way to fight a fire is to prevent it from happening in the first place” (Cyr & Johnson, 2006). Risk reduction measures are the ultimate performance (outcome) measures that justify the expenses of conducting prevention programs (Crawford, 2002).
Dr. Hall (2003) describes a series of questions that need to be answered to determine of the program is cost effective. “As a fire and life safety education program is developed and applied, questions needing data arise and may be grouped into the following six sections: 1) What is the problem to be addressed, 2) What is the strategy to address the problem, 3) Who is the target audience, 4) Was the target audience reached by the strategy, 5) Did the strategy change the target audiences as intended, and 6) Did the fire problem decline? Answering these questions will assist in determining if the money spent on the program was a wise investment (p. 455).

To truly focus on the local issues, the author consulted at least one local hospital to determine the most common type and cause of injuries to children. According to Marci Stone, Emergency Preparedness Coordinator for the Lewis-Gale Medical Center, one of the most common causes of injuries to children locally is injuries caused by motor vehicle crashes. This is in conjunction with the use of seat belts and car seats (personal communication, April 13, 2008).

According to Tiffany Bradbury, Public Education Specialist for the Roanoke Fire-EMS Department, car seat installation has become a priority issue in educating the public. Bradbury stated that local hospitals require new parents to undergo a brief training session before being allowed to leave the hospital after the birth of a child (personal communication, April 1, 2008). It was not uncommon to observe car seats that were not installed properly.

Bradbury also stated, that another common injury being experienced by children were head injuries related to bicycle crashes. She stated that children riding bicycles without safety helmets was a growing trend in the community. Both of these issues are covered within the NFPA Risk Watch curriculum.

According to Bradbury, the reason that the NFPA Risk Watch program is not used in its entirety is the amount of time allotted for presentations in each school (personal
communication, April 1, 2008). Each school has a limited amount of time for which risk reduction presentations can be made. The Virginia Standards of Learning (SOL’s), are the main focus of school teachers (Appendix B). Students must achieve SOL’s before advancing to the next grade level. The SOL’s for the fourth grade level include a section of instruction on health and safety which could be used for risk reduction presentations. Sections 4.6 and 4.7 focus on community health issues.

The literature review conducted for this research project provided an overview of current issues regarding public education and elements of a curriculum. Appropriate safety messages for an elementary school curriculum should focus on the individual community’s problems. The problems can be identified by conducting a community risk analysis. “A community analysis is a process that identifies fire and life safety problems and the demographic characteristics of those in a community” (Robertson, 2005, p. 39).

On duty personnel can be trained to deliver risk reduction messages to school children. Group presentations allow for a way to learn about the people in the community and are a win-win situation because fire personnel get a chance to understand the community members and take part in public relations as the same time. (IFSTA, 2007). Operation’s personnel can be trained to deliver the safety messages with minimal preparation.

A summative evaluation will determine if the curriculum is achieving the desired results. The results of the evaluation can lead to changes to the program to ensure the local problems are being properly addressed. Many of the authors of the literature that was reviewed stated that on-duty personnel are a good choice to deliver a risk reduction message to school children because they are already on-duty and also already have a basic understanding of the demographics of the local areas they serve.
Procedures

The purpose of this research was to identify the most common occurring fire and injury causes and then develop an appropriate risk reduction safety program to address those issues for delivery to the local public school system. The author utilized action research in completing the research project. The procedures utilized for this research project included the following: 1) answering research questions, 2) conducting a comprehensive literature review, 3) consulting the departments Fire Marshal for fire data, 4) consulting the departments Public Education Specialist, reviewing current Virginia Standard of Learning, and 5) consulting local agencies to collect local data involving injuries related to local children age 14 and under to get an understanding of the scope of the community problem.

Action research began with a review of pertinent fire service literature that covered public education and risk reduction programs and curriculums. The International Fire Service Training Association (IFSTA) five step planning process was utilized as a guide in developing a plan to establish a community risk reduction curriculum which the department could implement if approved by the chief. Data collected for the first step was obtained from the Fire Marshal, Public Education Specialist and also information obtained from local hospital emergency department records.

A data analysis was conducted to determine the most common occurring causes of fires and injuries to children. The second step was to determine the most common hazards being encountered and develop an awareness component within the new risk reduction curriculum to address them. The third step required the use of Operation’s personnel to deliver the risk reduction program in elementary schools. The fourth step required implementing the program.
The fifth step required an evaluation of the program that included the elements of the curriculum to ensure that the program meets the needs by addressing the hazards identified in the first step.

The review did have limitations relevant to the project. One limitation was that obtaining data from internal and external sources was difficult. Some of the internal divisions within the fire-EMS department that control access to data had a difficult time separating components of the data in order to obtain a clear picture of the specific problems. Personnel from the Prevention Division had a difficult time specifying the actual number of fires caused by children each year within the locality. The causes of fires are normally documented but the ages of those involved are not easily obtained. The author contacted the Emergency Preparedness Coordinator at a local hospital to obtain data concerning injuries related to children. After being referred to various departments within the hospital, the data was obtained.

Results

To answer the question about what safety messages are appropriate for elementary schools, the author researched various sources to determine what problems are common to children, especially at the local level in order to determine the local community’s problems. The National Fire Protection Association (NFPA) has developed the Risk Watch program. This program focuses on eight core topics related to children: 1) Motor vehicle safety, 2) Fire and burn prevention, 3) Choking, suffocation, and strangulation prevention, 4) Poisoning prevention, 5) Fall prevention, 6) Firearms injury prevention, 7) Bike and pedestrian safety, and 8) Water Safety. These are very common issues faced by most communities. Local injury causes include: 1) Falls, 2) Motor vehicle crashes, 3) Sports, 4) Overexertion, 5) Poisoning, 6) Cutting instrument injuries. The most common cause of ignition in fires involving children was a
cigarette lighter or pack of matches. Children were injured or killed by fires that they themselves started.

To answer the question about how should the program be delivered to school children the author conducted a literature review of current fire service material. Current fire and emergency services literature consistently indicated that on-duty fire personnel would be a logical choice for conducting public education presentation in lieu of full-time fire prevention personnel dedicated to the task. Operation’s personnel are already on-duty and are very familiar with their respective response districts. This gives them the advantage of an awareness of the demographics of that district. By assigning Operation’s personnel to make risk reduction presentations, they can further develop a relationship with the citizens within their districts (Crawford, 2002).

To answer the question of how will Operation’s personnel be trained to deliver the safety messages, the author conducted a review of current fire service material regarding instructional techniques and conducted an interview with a retired chief officer of a neighboring department. According to retired Fire Chief Tom Fuqua, on-duty personnel can be trained and certified as Fire Instructor 1. This will enable them to deliver a prepared presentation using basic public speaking techniques. Personnel can receive further training in techniques for communicating with children. The course “Communicating with children” instructs personnel on how to effectively teach children (personal communication, April 1, 2008).

Information taught by Operation’s personnel can then be relayed to the student’s family members. Once the children learn the new material, they can share that new information with their family members. The student will understand the importance of informing family members about community health problems (Crawford, 2002). This is similar to Standard of Learning
section 4.7, which states the student will understand the importance of communicating with family about personal and community health issues (Appendix B).

To answer the question of how to evaluate the risk reduction curriculum, the author reviewed various standard evaluation models. Once the local problems are identified, then solutions can be implemented to address the issues of the community. If the appropriate problems have been correctly identified, there should be a related reduction in fires and injuries.

The evaluation shall contain an element to determine if the Operation’s personnel have been adequately prepared to make the presentations. Post tests can be administered to determine if cognitive knowledge has been retained by students. Measuring educational gain shows that public fire and life safety education activities are producing a desired learning result (Crawford, 2002). Future data analysis will determine if there is a variance in the rate of fires and injuries to children. The resulting data shall be indicative of the problems being identified at the beginning of the process and that the instructional methodology used was appropriate for the audience.

A reduction in the rate of occurrence of fires and injuries will be seen as a success. “The effectiveness measures most commonly used include educational gain, risk reduction, and loss reduction (Crawford, 2002, p. 13). If the data analysis does not demonstrate a reduction in the identified problems, then the curriculum will have to be altered to better reflect the identified problems in the community.

To answer the question of whether or not using Operation’s personnel is cost effective in performing risk reduction, the author reviewed current fire service literature and interviewed fire service personnel with experience in public education. Many argue that available funds are better spent on response activity rather than prevention activity. “Advocates in the organization for funding and supporting emergency operations are always stronger than those supporting
Public safety education curriculum

prevention programs” (Smeby, 2006, p. 100). This is an issue that must be overcome if the program is expected to succeed. The benefits of being proactive must be exploited. “The best way to fight a fire is to prevent it from happening in the first place” (Cyr & Johnson, 2006).

The cost effectiveness of having Operations personnel perform risk reduction in public schools can be viewed in many ways. One obvious benefit is the positive public relations that are generated by fire-EMS departments being proactive instead of only being reactive in regard to the community’s problems. “While there are other ways to enhance the department’s image, the means most often used by fire and emergency services organizations is public education: one of the most cost effective safety activities of any fire and emergency organization” (IFSTA, 2004, p. 233).

It is difficult to demonstrate that a certain number of injuries or fires were prevented by a risk reduction program. How can it be quantified that prevention efforts are worth the funds directed towards a prevention program. “Can a dollar value be assigned to a person’s life or quality of life” (Smeby, 2006, p. 57). Can it be shown that an injury is prevented for every dollar spent? In many cases, citizens do not realize that their behavior has saved them from losses from fires. “The beneficiaries of a comprehensive prevention program in many cases do not even know that they have been saved or property loss has been averted” (Smeby, 2006, p. 100).

Discussion

On a national level, nearly 600 children under the age of 15 were killed as a result of fires in 2001 (United States Fire Administration, 2008). In Roanoke, Virginia, one of the most common causes of injury to local children under 14 years old is due to motor vehicle crashes (personal communication with Marci Stone, April 13, 2008). These are known problems that are
occurring and having a devastating impact on those families involved. These are preventable causes that could be addressed through a uniform risk reduction curriculum.

Appropriate safety messages are for elementary schools will vary from community to another. Using a standard planning process, the local community’s risk can be identified. “A community analysis is a process that identifies fire and life safety problems and the demographic characteristics of those in a community” (Robertson, 2005, p. 39). Once local risks are identified, a risk reduction curriculum can be developed to address those specific issues.

“In addition to fire safety, many other safety concerns are included in these programs such as vehicle accidents, pool and water safety, as well as other common accidents that cause injuries and deaths” (Smeby, 2006, p. 8). There are multiple hazards that can be included in a risk reduction curriculum. The Company Officer manual details three types of hazards to be covered that include a.) What to do in the event of a fire or other emergency, b.) How to prevent a fire or emergency from occurring, and c.) How to persuade others to use fire or life safety behaviors (IFSTA, 2007).

The National Fire Protection Association Risk Watch program covers 8 core topics: 1) Motor vehicle safety, 2) Fire and burn prevention, 3) Choking, suffocation, and strangulation prevention, 4) Poisoning prevention, 5) Fall prevention, 6) Firearms injury prevention, 7) Bike and pedestrian safety, and 8) Water Safety (Appendix B). These topics could be integrated into a curriculum that highlights the local problems facing the community.

Topics that are covered in the NFPA Risk Watch are typical of those problems found in most communities. A risk reduction curriculum could use those core topics as the foundation to build a program that incorporates data that reflects the local problems. One common topic covered in the NFPA Risk Watch program is motor vehicle safety. According to Marci Stone, the most common cause of injured children in the local community is car crashes
According to the NFPA Risk Watch web site, child safety seats, when correctly installed and used, reduce the risk of death by up to 71 percent.

The Roanoke Fire-EMS Department currently has a car seat installation program currently in place that could be incorporated into a risk reduction program. By incorporating this service into a curriculum, one element of the local problem would be addressed. Each element of the NFPA Risk Watch could be modified to meet the need of the local community in conjunction with local data. This way, those local problems occurring most can have more emphasis placed on them.

The program can be delivered to students by personnel already on duty in the Operation’s Division. Personnel already on-duty can be utilized to deliver the curriculum to school children within their response districts. Operation’s personnel should already have a good understanding of the community demographics. “While there are other ways to enhance the department’s image, the means most often used by fire and emergency services organizations is public education: one of the most cost effective safety activities of any fire and emergency organization” (IFSTA, 2004, p. 233).

In a conversation with retired Fire Chief Tom Fuqua, he stated that personnel are already on duty and public education can be made part of their duty for a certain number of hours during fire prevention month or any other time when they are not busy responding to alarms (personal communication, April 1, 2008). Fuqua stated “It is more cost effective to conduct public education versus having to respond to a structure fire or accident involving a child or any other person if that accident could have been prevented”. Aside from the obvious dollar loss, there is the human suffering to consider” (personal communication April 1, 2008).
Operation’s personnel can make scheduled visit to schools within their response districts and present material prepared by the Public Education Specialist. The presentation could consist of a brief interactive lecture which includes awareness information on fire and injury causes. “The education portion of the program provides public fire prevention and life safety information to the population through brochures, presentations, and activities” (IFSTA, 2004, p. 358).

Making presentations to the individual school classes will assist in maintaining the control of the group. Group presentations allow for a way to learn about the people in the community and are a win-win situation because fire personnel get a chance to understand the community members and take part in public relations as the same time. (IFSTA, 2007).

Operation’s personnel can easily be trained to deliver a risk reduction curriculum. The first step in preparing Operation’s personnel would be to train and certify them as Fire Instructor 1 and also “Communicating with children”. At this level, an instructor is trained to deliver a prepared lesson plan and how to effectively teach children. The Public Education Specialist can prepare a lesson plan using the NFPA Risk Watch as a general guide and incorporate local data on the community problems into a short lesson plan. Operation’s personnel can use that lesson plan as a guide when making presentations to school children. To make sure that all Operation’s personnel receive the same lesson plan, the material can be placed on the department’s shared drive or Moodle Rooms web site where online training is facilitated.

Moodle Rooms is very similar to Blackboard which is used by many colleges as a way to facilitate distance learning. Lesson plans could be maintained on the Moodle web site for quick access. The Public Education Specialist can utilize current data from the Fire Marshal and update the lesson plan on Moodle Rooms as needed to address emerging trends being experienced at the local level. This can be done to address evolving problems within a specific
Public safety education curriculum

response district if the need arises. By using Moodle Rooms to store lesson plans, updates can be made as new data becomes available. Each time an Operation’s company is assigned to make a presentation, an updated lesson plan can be downloaded with the latest information.

An evaluation should be conducted on the various components of a risk reduction program. Program components to evaluate include identifying the local problems, appropriate preparation of personnel making the presentations, and overall effectiveness of the program. An evaluation will show if the appropriate problems have been correctly identified. If the problems are correctly identified, then solutions can be developed to address them. The implemented solutions should lead to a reduction of fires and injuries involving children. “The effectiveness measures most commonly used include educational gain, risk reduction, and loss reduction” (Crawford, 2002, p. 13).

Department statistics can be used to determine if there is an increase or decrease in the rate of fires or injuries being experienced by children. Public education records are helpful in determining the number of children contacted and the hours actually spent on public education activity. Performance measures will provide an indication as to whether prevention programs are producing the desired results and doing so in an efficient manner (Crawford, 2002).

The cost effectiveness of having Operation’s personnel perform risk reduction presentations in public schools can be viewed as maximizing current resources. There are multiple benefits of using field personnel to visit schools to provide public education programs. According to retired chief Tom Fuqua, public education provides the fire department the chance to be proactive in their service delivery. When the public sees firefighters on a non-emergency setting in this type activity, this helps develop a strong relationship with the community (personal communication, April 1, 2008).
The community will see that the firefighters go beyond extinguishing fires; they also attempt to educate children to prevent fires and accidents. “While there are other ways to enhance the department’s image, the means most often used by fire and emergency services organizations is public education: one of the most cost effective safety activities of any fire and emergency organization” (IFSTA, 2004, p. 233).

Implications for the organization exist. Currently the risk reduction material being delivered to children is inconsistent from one presentation to another. If this continues, the opportunity to reduce the frequency of fires and injuries will be lost. The following is a sample lesson plan of a risk reduction curriculum:

Sample Lesson Plan

1. Motor vehicle safety
   - Seat belts usage
   - Car seats installation by fire personnel at various stations free of charge.

2. Fire and burn prevention
   - Matches & Lighters

3. Choking, suffocation, and strangulation prevention
   - Plastic bags
   - Clothing draw strings
   - Small toys

4. Poisoning prevention
   - Cleaning supplies in kitchen, basement, garage
   - Yard chemicals – weed killer
5. Fall prevention
   - Stairs
   - Clutter
   - Trip hazards

6. Firearms injury prevention
   - Leave them alone.
   - Tell a grown up.

7. Bike and pedestrian safety
   - Bike helmets
   - Crossing the street, cross walks

(Appendix F-Sample Lesson Plan)

Recommendations

The author’s findings indicate that the development of a short risk reduction program which could be delivered to children by Operation’s personnel who are on duty. This would be a cost effective use of current resources. The program could incorporate local data which highlights the issues being experienced by the community. Operation’s personnel should be trained and certified to the Fire Instructor 1 level to learn basic instructional techniques. Personnel can also receive training in “Communicating with Children”.

For this program, Operation’s personnel can then obtain training to specialize in teaching children. The program “Communicating with children”, instructs personnel in ways to effectively teach children. This will assist in making sure an appropriate level of instruction takes place.
The “Communicating with children” course instructs personnel how to effectively select appropriate safety information and materials for delivery to children ages 3-14 years of age. The four hour course is designed for personnel with no prior training in public education. The three Operation’s shifts could receive the four hour class while on duty as in-service training. This will provide uniformity in the preparation of Operation’s personnel since they will all receive the same training from the same source.

The Public Education Specialist can prepare the lesson plan using the NFPA Risk Watch as a general guide and incorporate local data on the community problems into a short lesson plan that Operation’s personnel can use as a lesson plan when making presentations to school children. This will assist in addressing local problems. To make sure that all Operation’s personnel receive the lesson plan, the material can be placed on the departments shared computer drive or Moodle Rooms web site where online training is facilitated. Moodle Rooms is very similar to Blackboard which is used by many colleges as a way to facilitate distance learning. Operation’s personnel have already received initial training on utilizing Moodle Rooms as a distance learning system for receiving instruction while remaining in-service. This allows Operation’s companies to remain available to respond to alarms.

The Public Education Specialist can obtain current data from the Fire Marshal and update the lesson plan on Moodle Rooms as needed to address emerging trends being experienced at the local level. This can be done to address evolving problems within a specific response district if the need arises. By implementing a standard risk reduction curriculum, Operation’s personnel can assist in delivering a uniform safety message to school children to address the most common occurring causes of fires and injuries.
The program should target students at the fourth grade level initially. The Virginia Standards of learning contains elements that are linked to community related health issues. This way, children can receive the new information and then they can be evaluated in the next school year as fifth graders. The evaluation will determine if the information is appropriate and what modifications need to be made. If the evaluation demonstrates success, the program could be expanded to include additional target audiences.

Research gathered during this project presented another opportunity for future study. Elderly Virginians 65 and older are at greatest risk of dying from a fire or burn related injury than any other age group. The elderly five year crude death rate was 4.31 per 100,000. Elderly males had a higher death rate than elderly females. Over half (67%) of these deaths were from exposure to an uncontrolled (Virginia Department of Health, 2007). A similar curriculum could be developed to address safety issues involving the elderly as was created for children.
References


Appendix A

The five step IFSTA planning process provides a systematic planning and action process and is composed of the following steps:

1.) Identify the life safety hazards in the locality.

2.) Select the most effective and efficient solutions to the hazards.

3.) Design the most effective means of delivering the program’s elements to the service area.

4.) Implement the program message to the audience.

5.) Evaluate the effectiveness of the program.
Appendix B

Virginia Standards of Learning
Grade Four

Students in grade four learn and apply health skills to the following health areas: disease prevention, nutrition, healthy relationships, use of tobacco, and use/abuse of alcohol. Students begin to recognize the existence of myths related to health information, distinguish fact from fiction, and set simple goals for promoting personal health and preventing disease. Students assume personal responsibility for helping promote health at school and in the community.

Knowledge and Skills

4.1 The student will explain how nutrition affects personal health and academic achievement. Key concepts/skills include
   a) the nutrients needed for proper brain functioning;
   b) the components of a balanced meal;
   c) the effects of malnutrition;
   d) the impact of growth and development;
   e) the impact of fats, carbohydrates, and proteins on physical performance.

4.2 The student will develop the skills necessary for coping with difficult relationships. Key concepts/skills include
   a) development of refusal skills;
   b) identification of bullying and aggressive behaviors;
   c) development of coping skills;
   d) recognition of harmful or abusive relationships;
   e) practicing self-control.

4.3 The student will describe and evaluate the effects of alcohol, inhalants, tobacco, and drug use on the family and community. Key concepts/skills include
   a) the impact on self, family, and community;
   b) the long-term consequences of drug use;
   c) acts of violence and the use of weapons;
   d) laws related to illegal alcohol and tobacco use.

4.4 The student will demonstrate an understanding of health concepts and behaviors that prevent illness of self and others. Key concepts/skills include
   a) the body’s defenses;
   b) the spread of germs (viruses, bacteria, and fungi);
   c) the difference between communicable and noncommunicable diseases;
   d) the importance of early detection of health problems;
   e) the role of regular physical activity.

Information Access and Use

4.5 The student will access and use health resources to improve personal and family health. Key concepts/skills include
a) the use of health care agencies, printed materials, broadcast media, Internet, and audiovisual materials;
b) identification of accurate and inaccurate health information.

Community Health and Wellness
4.6 The student will evaluate his/her role in solving community health problems. Key concepts/skills include
a) personal responsibility for exhibiting healthy practices within the school and community setting;
b) the benefits of volunteerism.

4.7 The student will understand the importance of communicating with family about personal and community health issues. Key concepts/skills include
a) identification of obstacles and solutions to communication;
b) assistance from a trusted adult when in unsafe or uncomfortable situations.
# Appendix C

**Risk Watch, Grades 3–4**

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**Evaluation Instruments**

| Risk Watch Knowledge Test | 4.5f |

**Accessing Resources**

| Community Resources | 4.1c |
Appendix C continued

**Risk Watch, Grades 3–4**

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Appendix D

NFPA Risk Watch Topics

1. Motor vehicle safety
2. Fire and burn prevention
3. Choking, suffocation, and strangulation prevention
4. Poisoning prevention
5. Fall prevention
6. Firearms injury prevention
7. Bike and pedestrian safety
8. Water Safety
Appendix E

Virginia Department of Fire Programs

Communicating with children (4 hour course)

Communicating With Children Description: This course is designed to cover developmental characteristics and learning capabilities of children, ages 3 -14. Included will be how to select the appropriate fire safety messages and materials. This course is designed for fire service personnel who have little or no experience in public fire education. Prerequisites: None Equip. Req: None Hours: 4 Standard/Reg: None Special Note: This is not a certification course. Students will receive VDFP training hours and a Certificate of Attendance.
Appendix F
Sample Lesson Plan

1. Motor vehicle safety
   - Seat belts usage
   - Car seats installation by fire personnel at various stations free of charge.

2. Fire and burn prevention
   - Matches & Lighters

3. Choking, suffocation, and strangulation prevention
   - Small toys
   - Plastic bags
   - Clothing draw strings

4. Poisoning prevention
   - Cleaning supplies in kitchen, basement, garage
   - Yard chemicals – weed killer, fertilizer

5. Fall prevention
   - Stairs
   - Clutter, Trip hazards

6. Firearms injury prevention
   - Leave them alone, Tell a grown up.

7. Bike and pedestrian safety
   - Bike helmets
   - Crossing the street, cross walks