Module on:

Residential Fire Safety: An Overview of the Problem and Interventions.

Ky Injury Prevention and Research Center
Pediatric and Adolescent Injury Prevention Program

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Notes On Using This Module

This module provides an overview of the problem of residential fires and provides knowledge on useful intervention strategies. It is designed to be used by public health professionals (health educators, clinic, school and community nurses; family resource personnel, etc.) for training purposes. This module can: 1) be used as developed, 2) be modified and/or adapted by the trainer to meet the needs of a particular audience 3) serve as an educational tool to broaden the trainer's scope of knowledge.

The content provided within this module is a comprehensive overview of the most current fire safety information. The content of this entire module can be adapted for sessions from ½ - 1 hours in length depending on the level of interaction with the audience.

Residential Fire Safety:
An Overview of the Problem and the Interventions

Introduction:

Injuries are the leading cause of death for children between the ages of 1-18 in Kentucky. Fire and Burns are the second leading cause of unintentional injuries for this age group. The high frequency of these numbers coupled with a proven prevention strategy make fire safety a good priority for public health professionals to address. These professionals are in the prime position to help reduce fire injuries and death in their communities.

Objectives:

- Correctly describe the problem of residential fires.
- Describe safe behaviors and environmental adaptations to prevent fire.
- Identify what interventions can help in the event of a fire.

The problem of residential fires.

Residential fires are a serious and often preventable problem. Children under 5 are particularly vulnerable to residential fires because of their decreased perception of danger, less control of their environment and a limited ability to respond appropriately to situations that require immediate decision making. This combination leaves many children injured and killed every year. We know:

Nationally

- In 1995 more than 800 children ages 14 and under died in residential fires. More than 60 percent of these children were ages 4 and under.
- Each year, nearly 47,000 children ages 14 and under are injured in residential fires. Over one-half of these children are age 4 and under.
- Each year, children playing with fire cause more than 20,000 residential fires, resulting in nearly 300 deaths and more than 2,300 injuries.
- Three-fourths of all fire related deaths are from smoke inhalation. Flames and burns are responsible for one-fourth of fire-related deaths and injuries.
  (National SAFE KIDS Campaign, Residential Fire Fact Sheet, 1997)

In Kentucky

- From 1990 - 1996, Fire/Burns were the leading cause of death for 1-4 year olds. This outranked motor vehicle crashes, the leading cause of death for 1- 4 year olds in the nation.
  (Ky Injury Prevention and Research Center, 1996)

- Higher rates of residential fire deaths have been associated with the southeastern states, including Kentucky. This correlates with a larger fraction of residents living in poverty stricken and rural areas.
- Higher rates of fire deaths are also attributed to milder winters because of the wide spread practice of space heating that can be a serious fire hazard if not properly used.

(National Fire Protection Association, Fire Analysis and Research Division, 1996)

- Higher rates of fire deaths have also been associated with housing in mobile homes, especially those built before 1976**.**

Safe Behaviors and Environmental Adaptations to Prevent Fire

Smoking—Smoking is the leading cause of deadly home fires. This is particularly problematic for Kentucky because of the high number of smokers.

- Keep matches, lighters out of the reach of children. Teach older children that they are dangerous and should not be considered a toy.
- Cigarettes pose a serious fire hazard. Abstain from smoking in bed or when drowsy. When discarding cigarette butts, make sure they are fully extinguished to avoid igniting smoldering fires.

Wood or coal burning stove

- Have wood stove inspected and cleaned annually by a certified chimney inspector. Creosote, a highly combustible substance, can build up in stovepipes and chimneys. This looks like black paint and is a sign that the stove is not working properly.
- Burning wood that has been aged (seasoned) minimizes creosote build up. Wood stored in the spring will be seasoned and ready to burn in the fall.
- Be careful not to overload the stove with too much wood. Excessive wood can cause the wood to smolder. This may lead to excessive creosote build up.
- Install stovepipe thermometers to help monitor flue temperatures. Excessive temperatures impose a risk of fire.
- Keep a dry chemical fire extinguisher nearby. In the event of an out of control fire, close the damper and air inlet immediately and call the fire department.
- Wood or coal burning stoves can not be safely installed in most mobile homes. If such a unit does exist, family should have the stove inspected by the fire department.

Kitchen

- Never leave food, especially foods with grease, unattended on the stove.
- If a fire starts in a stovetop, pan turn the heat source off. Cover pan with a lid or use baking soda to extinguish the flames. Never use water on a grease fire.
- If a fire is burning in your oven, turn off and keep the door closed. If fire continues to blaze, call your fire department.
- Turn pan handles inward to avoid spills and keep combustibles away from flames and hot surfaces.
- Make sure burners and burner pans are clean to avoid igniting food residues.

Electricity

- Have a licensed electrician inspect the home to ensure that wiring meets basic electrical codes for community. This is especially important if living or moving into an older home that may have been built before current codes.
- Never overload wall sockets or extension cords with excessive appliances. Too many appliance cords using electricity from one electrical outlet can increase the risk of fire.
- Routinely check your electrical appliances and wiring. Frayed wires can cause fires. Replace all worn, old and damaged appliance cords immediately.
- If an appliance has a three prong plug, never force fit into a two-slot outlet or extension cord.
- Unplug unused appliances. When still plugged in an outlet, appliances carry a dangerous electrical charge.
- Appliances and their cords need to be kept away from water. If an appliance falls into the water, do not retrieve it until the appliance has been unplugged.
- Stock up on flashlights and extra batteries. In the event of a power outage, refrain from using candles for emergency lighting.

Fire places

- Clean your fireplace regularly and have the chimney cleaned and inspected every year.
- Clear the area around the hearth of debris, decorations and flammable materials.
- Never use flammable liquids to start a fire.
- Burn only seasoned hardwood. Soft moist wood accelerates creosote build up.
- Never burn cardboard boxes, trash or debris in your fireplace or wood stove. This can create toxic fumes and creosote build up.
- Place metal mesh screen in front of a fireplace to protect against popping embers that could ignite fires.
- Make sure that the fire in the fireplace has been fully extinguished before going to sleep or leaving the house.
- Remove branches hanging above the chimney, flues or vents.

Furnace maintenance

- Keep furnace clear of combustible materials.
- Install fire-resistive materials such as fire drywall or fire-resistant acoustic in area where furnace is located.
- Regularly check heating equipment for rusted parts, insecure mountings and cracks.

Space heaters/Kerosene heaters—These are common sources of heat during the cold winter months. They need to be used with extreme caution because they are often causes of fire.

- Never add fuel to a portable heater that is turned on or still hot. It is possible that this fuel could explode into flames. Also do not smoke cigarettes around or while filling heater.

- Never run the heater's cord under a carpet, rug or furniture. The cord could over heat and ignite near by material.
- Keep things that could easily ignite at least 3 feet from heater. This includes draperies, rugs, furniture, bedding, and clothing. (Do this even if heater is equipped with safety features such as heating element guards).
- Make sure children are always well attended around space heaters. Children may become curious and poke fingers and other objects through the protective guards.
- Never leave heaters on while sleeping.
- Store kerosene out of reach of children—outdoors, in a tight container labeled kerosene.
- Keep kerosene heaters in a well ventilated room.

Halogen lamps-- most torchiere-style halogen lamps can reach very high temperatures and can pose a fire safety hazard.

- Never place fabric materials on top of halogen lamps or place lamps near curtains where there is a chance the fabric may be blown on top of the lamp.
- Do not leave halogen lamps burning when you leave the room or when you are not at home.
- For lamps equipped with a dimmer switch, operate at the setting lower than the maximum whenever possible.
- Consider replacing halogen lamps with safer lighting sources.

Interventions that can help in the event of a fire.

- **Environmental interventions that can help in the event of a fire**
- **Behaviors that can help in the event of a fire**.

Environmental interventions that can help in the event of a fire.

Smoke Alarms—Many types of alarms exist on the market. The different alarms have various advantages**.**

There are 2 main types of alarm sensors: ionization and photoelectric

Ionization-- superior detectors of fast flaming fires (e.g. cooking fires)
Photoelectric-- Superior detectors of slow smoldering fires (e.g. upholstered furniture)
Combination types – Ionization/photoelectric and Carbon monoxide/ionization

Power Sources –

Hard wired—(runs through electrical system of house)
9-volt alkaline or zinc carbon battery

9-volt lithium battery (Will last 10 years)
(Combination- hard wire and 9-volt alkaline or zinc carbon battery

Smoke alarms are an affordable and easy fire prevention strategy. Average retail price for a smoke detector with a 9-volt carbon battery is about $8 dollars and a lithium battery powered smoke detector cost about $20 dollars.

Smoke alarm maintenance

- Test smoke alarms every month to make sure they properly work.
- Change batteries (on the alarms that contain the 9-volt carbon battery) every 6 months. (An easy way to do this is to replace the battery every time you have to change your clock for daylight savings time.)
- Keep alarms clean. Dust and debris can interfere with their operation, so vacuum over and around your smoke alarm regularly.
- If smoke alarm goes off while cooking do not disable your smoke detector. Clear the air by waving a towel and/or opening window.
- Make sure everyone is familiar with the sound. Install smoke detectors on every floor of your home or apartment (including the basement). Install outside each sleeping area and outside kitchen.
- Smoke alarms have a life span of about 10 years. Make note of how old detectors are by writing the date installed with a permanent marker on the inside of the alarm and replace when necessary.
- There are specially made detectors available for those with hearing impairment. For more information contact the library at the National Emergency Training Center at 1-800-638-1821.

Carbon monoxide detectors

Carbon monoxide is an odorless colorless gas that interferes with the delivery of oxygen to the rest of the body. It is produced by the incomplete combustion of carbon containing fuels such as coal, wood, charcoal, natural gas and fuel oil. This gas results in the yearly death of about 2100 people. Many of the sources of CO2, such as unvented kerosene and gas space heaters, furnaces, wood and gas stoves, and fire places are the same heat producing mechanisms associated with increased risk of fire. CO2 detectors should be installed in the home and placed close to sleeping areas. For more information call the Consumer Product Safety Commission at 1-800-638-CPSC.
(Ball, 1997).

Tot Finders

These reflective stickers identify the sleeping location of a child. They used to be placed outdoors on the windows. The current recommendation is to place these stickers inside the house low on the door of children's room so firefighters can easily locate children in sleeping areas while crawling through the house in the event of a fire.

Fire Extinguishers

- Multi-purpose dry chemical extinguishers work well on wood, grease, and other flammable liquid and electrical fires.
- Make sure there is at least one extinguisher on each floor of your house. Especially near high-risk areas like the kitchen, garage, laundry room or workshop.
- Have every adult in the home know how to use fire extinguishers properly. This includes knowing when not to use them.
- Periodically check extinguishers to determine if they are still functional.

Behaviors that can help in the event of a fire.

Have a fire escape plan and practice monthly.

- Practice finding 2 ways out of every room.
- Since most fires occur at night, include practicing at night when most fires strike.
- Purchase chain ladders for second or third story buildings.
- In the event of a fire, have a designated outside meeting place away from the home.

Special considerations:

- Make sure that windows in the house are not stuck and can open sufficiently for an adult to exit through.
- If security bars are on the window to protect from intruders, make sure that they have a quick release device to allow them to be opened immediately. Make sure that everyone in home knows how to release them.
- Make sure everyone understands and practices how to properly operate and open locked or barred doors and windows.

Know how to safely get out and stay out.

- Make sure doors are safe to go through by testing the temperature with the back of the hand. If the door is warm, fire and smoke are likely to be on the other side. Use an alternative exit.
- Crawl on your hands and knees to get out of the house. The air low to the ground has fewer toxins in it and may be more visible then higher above air that can contain very thick black smoke.
- Once safely out, stay out! Go to the designated meeting place. **Never** enter a burning building.
- Inform firefighters if someone is still located in the home.
- If clothes become ignited, ***stop*** where you are, ***drop*** to the ground and ***roll*** until flames are extinguished.

Teach and reinforce age appropriate safety behaviors to children that can help them in the event of a fire. Additional fire safety issues to educate children about include:

- Educating children about the role of firemen and how they look. Children are sometimes frightened by the appearance of firemen wearing all the equipment/gear and may run and hide from them.

- Make sure children never hide in the event of a fire. Children become frightened and feel safer in hiding places. Make sure they understand that the best practice is to leave the house immediately.
- When teaching children about “stop, drop, and roll”, emphasize this is only done in the event of having clothes catch on fire and does not replace getting out of the house immediately.
- If older children are capable of calling 911 make sure they understand to call from a neighbor’s house.

Conclusion

Residential fires are a serious threat to children, families and can adversely affect an entire community. Public health providers are in the prime position to help educate community members on behaviors that can prevent fires from occurring as well as how to respond safely in the event of a fire. Through individual education, community projects, and public awareness campaigns; needed information that could save the life of a family member can be shared to prevent unnecessary deaths from occurring and meet a core public health function.

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