

CAREGIVER PERCEPTIONS OF CHILDREN'S RISKS ASSOCIATED WITH
EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE

by

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ABSTRACT

The detrimental health effects of exposure to environmental tobacco smoke are well researched and documented. Environmental tobacco smoke exposure has especially toxic effects on the respiratory health of young children. Children exposed to larger doses and for longer periods of time may suffer more severe consequences. Despite this compelling scientific data, evidence suggests that adults do not accurately recognize the risks of environmental tobacco smoke exposure. Therefore, children continue to be exposed to environmental tobacco smoke in their home environments. Through clean air legislation in all 50 states, environmental tobacco smoke exposure is partially regulated in public places. This does not, however, protect children from threats of environmental tobacco smoke exposure in private residences.

The purpose of this study was to describe how caregivers of rural-dwelling children perceive the children's risks associated with environmental tobacco smoke. Two aspects of the Health Belief Model, perceived susceptibility and perceived severity, were utilized in evaluating caregiver risk perceptions related to environmental tobacco smoke exposure. Data were selected from survey results gathered through the Environmental Risk Reduction through Nursing Intervention and Evaluation (ERRNIE) project. Survey results for rural, low-income caregivers (n = 31) residing in Gallatin County, Montana were included in this analysis.

The scores reflected in the survey results indicate that knowledge regarding environmental tobacco smoke exposure risks is moderate in this population. Caregivers sense that environmental tobacco smoke may be harmful, but they do not report a high level of concern regarding the detrimental effects of environmental tobacco smoke exposure for their own children. Data from this study is consistent with other documented research suggesting that, despite available information, caregivers do not accurately perceive the true severity of environmental tobacco smoke exposure.

The results of this descriptive study, nested within the larger ERRNIE project, indicate the need for further studies encompassing a larger sample size and an expanded geographic range. This study directs the focus of interventions at modifying risk perceptions of environmental tobacco smoke exposure to promote behavior change. Empowering caregivers with knowledge that may lead to behavior change is the key to enabling children to thrive in healthy environments.

CHAPTER 1

INTRODUCTION TO THE STUDY

Introduction

Environmental tobacco smoke (ETS) exposure is a serious health threat for children in the United States. One national survey reports that up to 43% of children younger than 11 years are exposed to ETS in the home (Pirkle et al., 1996). Many studies confirm the negative effects of ETS exposure in children, but less is known about the overall public perception of the risks associated with ETS exposure. Particularly important to this study are the risk perceptions of caregivers of young children.

In 1993, the United States Environmental Protection Agency released a report outlining the detrimental effects of ETS ("EPA Designates Passive Smoking a "Class A" or Known Human Carcinogen [EPA press release - January 7, 1993] ", 1993). Specifically, the EPA designated ETS as a known human carcinogen. The report noted that ETS contains at least 43 carcinogenic chemicals that are harmful for adults as well as for children ("EPA Designates Passive Smoking a "Class A" or Known Human Carcinogen [EPA press release - January 7, 1993] ", 1993). A recent report by the Center for Disease Control (CDC) implicates ETS in many adverse health conditions including heart attacks and lung cancer. In addition to cancers from prolonged exposure, there are many health effects documented in children exposed to ETS including: new-onset asthma, asthma exacerbations, SIDS, pneumonia, bronchitis, allergies, dental caries, otitis media, and decreased lung growth and function (Al-Delaimy, Luo, Woodward, & Howden-Chapman, 1999; Billings, Berkowitz, & Watson, 2004; DiFranza & Lew, 1996;

Emmons, Wong et al., 2001; , "EPA Designates Passive Smoking a "Class A" or Known Human Carcinogen [EPA press release - January 7, 1993] ", 1993; , "Fact Sheet: Secondhand Smoke", 2006; Kligman & Narce-Valente, 1990; Rizzi et al., 2004; Winickoff et al., 2003).

Tobacco smoking restrictions are regulated at the individual state level and all 50 states have some regulation on smoking in indoor public places ("State Legislated Action on Tobacco Issues (SLATI) Overview ", 2008). Forty-seven states prohibit smoking indoors in public places, although the degree of restriction varies widely. Most western states including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Washington have recently enacted clean indoor air acts restricting smoking in public places including schools, health facilities, grocery stores, government buildings, and childcare centers.

On October 1, 2005 The Montana Clean Indoor Air Act was put into action after passing through Montana legislation ("Montana Clean Indoor Air Act", 2007). This act prohibits smoking indoors in public places such as restaurants, stores, offices, buses/trains, auditoriums, daycare facilities, and healthcare facilities. This act also prohibits smoking anywhere on public school property including parking lots and playgrounds. These recent changes in legislation in the state of Montana have made positive strides in reducing ETS exposure in public places frequented by children. However, this regulation does not affect exposures incurred in private residences and cars. Community based nurses, including nurse practitioners engaged in primary care, have an important opportunity to provide education about ETS in their practice. Improved prevention efforts and reduction of ETS exposure in children can occur through

parental and family education regarding the negative effects of ETS exposure. Education at this level promotes caregiver risk awareness leading to risk reduction for young children as well as the entire family.

Purpose and Research Question

The broad purpose of this analysis seeks to describe how caregivers of rural-dwelling children perceive the children's risks associated with ETS. Although the focus in this study is on children in rural areas, adult perceptions of the children's risk will influence their own behavior and in turn influence the health environment of their children. Multiple studies indicate that environmental exposure to ETS poses significant health risks for children (Bollinger, 2003; Davies, 2003; DiFranza & Lew, 1996; Jochelson, Hua, & Rissel, 2003; Kligman & Narce-Valente, 1990; Mannino, Homa, & Redd, 2002; Rizzi et al., 2004; Winickoff et al., 2003). It is essential for health professionals to realize the depth of caregiver knowledge, or lack thereof, related to ETS exposure risks to children in order to provide appropriate educational materials.

The primary research question guiding this study is as follows:

- How do rural, low-income caregivers in Gallatin County, Montana perceive risk related to their children's exposure to environmental tobacco smoke?

An additional question addressed in this research study is:

- How do caregivers perceive the severity of health risks for their children associated with ETS exposure?

Caregivers may not understand the risks that environmental smoke poses for children. As one study indicates that a significant number of parents are unaware of the

detrimental effects that their smoking has on their children's health (Rowland, Lyons, & Salganicoff, 1994, as cited in Winickoff, et al., 2003). Due to age related dependence, young children count on their caregivers for a healthy living environment. For young children who spend much of their time in the home, caregivers control much of their environmental surroundings and the extent of their hazardous exposures. If they do not understand the risks, caregivers may have little motivation to protect their children from ETS exposure.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The following literature review first examines the multitude of potential health risks to children exposed to ETS. Physiological and situational attributes of children that put them at increased risk for detrimental effects of ETS exposure are also central to the discussion. Current literature and Montana legislation related to rural aspects of ETS exposure is included in the review. Caregiver perceptions related to ETS exposure risks are outlined in the context of rurality, socioeconomic status, and educational levels.

Literature discussed in this review was selected based on certain eligibility requirements including relevancy, currency, credibility, and accessibility. Included are full text, peer reviewed publications from 1990 to present. The collection of literature was generated using multiple reference sources including the environmental health based library created by the Environmental Risk Reduction through Nursing Intervention and Evaluation (ERRNIE) project and two separate computer-based searches. The specific search engines utilized in the information gathering process include the MSU library database, Google, and Yahoo. The key words used in the computer-based searches include: children, environmental tobacco smoke, risks, health, attitudes, and perceptions. The literature reviewed for this study present comparable information regarding these health risks. There is little conflicting data noted in review of the literature.

Child Specific Risk

Children are more susceptible to environmental hazards than adults for several reasons. Children incur a larger burden of exposure risk related to their small size, increased metabolism, and dependence on caregivers for environment (Al-Delaimy, Luo, Woodward, & Howden-Chapman, 1999; Schneider & Freeman, 2000). Relating specifically to airborne contaminants, children breathe faster, taking in proportionately more air and therefore a higher dose of ETS contaminants than their caregivers (Dunn, Burns, & Sattler, 2003; Schneider & Freeman, 2000). Children, by virtue of their smaller size, are more heavily exposed than adults to environmental contaminants (Dunn, Burns, & Sattler, 2003; Schneider & Freeman, 2000). This disproportionate exposure sets children up for more immediate adverse health effects from environmental exposures such as ETS (Al-Delaimy, Luo, Woodward, & Howden-Chapman, 1999). Seasonal variations in ETS exposure in children suggest that in climates with long winter seasons, such as Gallatin County, ETS exposure may be increased during those months spent primarily indoors (Chilmonczyk et al., 1990). The focus on young children in this study is important considering that previous studies have shown that correlations between ETS exposure and respiratory symptoms are stronger in preschool than school-age children due to developing lungs and increased respiratory rate (Cook & Strachan, 1999; Schneider & Freeman, 2000).

Exposure Risks

It is estimated that children spend up to 80% of their time indoors and between 38-43% of all children are exposed to ETS in their homes (Emmons, Wong et al., 2001;

Pirkle et al., 1996; Schneider & Freeman, 2000; Winickoff et al., 2003). Studies have shown that environmental exposures such as ETS are more pronounced in children from families in lower socioeconomic groups. Specifically, socially disadvantaged parents have been shown to smoke the most (Arborelius, Hallberg, & Hakansson, 2000).

Economic stress, manifested as an increase in the overall stress response, may promote poor coping skills and encourage habits in caregivers such as smoking (Gee & Grimpayne-Sturgesalt, 2004). Long-term exposure to ETS is more prevalent in low-income children with up to 68% of children from low-income families exposed to ETS (Emmons, Wong et al., 2001). The relevance of focusing on low income families in this study is confirmed by data showing that smoking behavior is most prevalent in poor families with low educational levels (Berman et al., 2003; Emmons, Wong et al., 2001; Helgason & Lund, 2001; Henschen et al., 1997; Jordaan, Ehrlich, & Potter, 1999). Families in lower socioeconomic brackets live in smaller homes, which correlates with evidence that the likelihood of exposure to ETS increase when living in a restricted space (Pirkle et al., 1996).

Several factors influence children's exposure to ETS including: number of cigarettes smoked in the presence of children, protective precautions by parents, mothers who smoke, age of the child, floor surface area of the home, and parental education level (Bakoula, Kafritsa, Kavadias, Haley, & Matsaniotis, 1997). Young children are dependent on adults for the well-being of their environment. Therefore they are vulnerable to hazards such as ETS exposure as they spend much of their time with their parents and have little choice in the quality of their environment (Al-Delaimy, Luo, Woodward, & Howden-Chapman, 1999; Crone, Reijneveld, Burgmeijer, & Hirasings,

2001). Literature also exists suggesting that smoking status of the mother, more so than the father, is the most important factor in children's exposure to ETS (Cook, Strachan, & Carey, 1998; Jordaan, Ehrlich, & Potter, 1999). It is noted that parental precautions to protect the child from ETS exposure may reduce their risk of exposure up to 40%, suggesting that caregiver education is essential in promoting clean air for children (Bakoula, Kafritsa, Kavadias, Haley, & Matsaniotis, 1997).

Tobacco smoking can cause individuals to be increasingly susceptible to other environmental toxins (Gee & Grimpayne-Sturgesalt, 2004). One study shows that inhaled radon particles may double in the presence of indoor ETS exposure (Glasgow et al., 1998). Low socioeconomic class may contribute to both ETS exposure in children and diminished ability for radon abatement, therefore increasing the overall lung risk in children. Studies also indicate that smoking tobacco indoors increases indoor carbon monoxide levels (Schneider & Freeman, 2000).

Health Risks

According to the American Academy of Pediatrics Committee on Environmental Health, exposure to ETS poses many health risks to children (Winickoff et al., 2003). The overwhelming trend in data indicates severe health effects from indoor ETS exposure (DiFranza & Lew, 1996). Several studies indicate that health problems related to environmental exposure to tobacco smoke include asthma, pneumonia, allergies, dental caries, otitis media, and decreased lung growth and function in children (Al-Delaimy, Luo, Woodward, & Howden-Chapman, 1999; Billings, Berkowitz, &

Watson, 2004; DiFranza & Lew, 1996; Emmons, Wong et al., 2001; Kligman & Narce-Valente, 1990; Rizzi et al., 2004; Winickoff et al., 2003).

Research shows that ETS exposure not only causes health problems, but also increases health risks for children with chronic respiratory diseases such as asthma (DiFranza & Lew, 1996; Winickoff et al., 2003). ETS exposure increases the severity of childhood asthma, increases the number of asthma exacerbations, and further decreases the already compromised lung function of children with asthma (Bollinger, 2003; DiFranza & Lew, 1996; Kligman & Narce-Valente, 1990). Evidence exists that all organ systems are affected to some degree by tobacco smoke exposure (Bek et al., 1999).

The EPA and CDC are in strong agreement that ETS exposure causes serious adverse health effects for children ("EPA Designates Passive Smoking a "Class A" or Known Human Carcinogen [EPA press release - January 7, 1993] ", 1993; , "Fact Sheet: Secondhand Smoke", 2006). As early as 1986, a Surgeon General's report documents that passive smoke exposure has various adverse effects on children (DiFranza & Lew, 1996). Kligman & Narce-Valente (2004) cite information indicating that the incidence of pneumonia and bronchitis increases in children exposed to ETS in their first year of life. Hospital admissions for pneumonia and bronchitis are increased for the children exposed to ETS during early childhood creating increased family and societal costs (Kligman & Narce-Valente, 1990).

Risk Perceptions

Several reports indicate that although attitudes about ETS may be changing, action is not correlating with this knowledge and further education for caregivers of

children is necessary (Emmons, Hammond et al., 2001; Jochelson, Hua, & Rissel, 2003; Johansson, Hermansson, & Ludvigsson, 2004; McMillen, Winickoff, Klein, & Weitzman, 2003). One report suggests that despite increases in smoking bans in public places, a considerable number of adults do not report accurate perceptions of the risks of ETS exposure (McMillen, Winickoff, Klein, & Weitzman, 2003). One study of two specific ethnic groups and their knowledge of the risks of ETS exposure to children revealed that most of the study population had a poor understanding of the harmful effects of ETS exposure (Jochelson, Hua, & Rissel, 2003). In fact, several of the participants in that study needed explanation on the concept of passive smoking (Jochelson, Hua, & Rissel, 2003). Jordan et al. (2005), reports that a significant percentage, 29%, of adolescents do not realize that passive smoking has a negative effect on their own health. Although this literature review is not specifically focused on perceptions of adolescents, this may suggest that the next generation of caregivers does not have proper understanding of the risks of ETS exposure.

Ashley et al. (1998), reports that over a four year period from 1992-1996, the number of smoking parents acknowledging that they should not smoke inside the home increased by 26%. This number indicates an increase in accurate perceptions of health risks related to children's exposure to ETS. The study also suggests that efforts to provide education have improved ETS exposure risks and that future research and education may continue to increase accurate public knowledge of ETS exposure (Ashley et al., 1998). This small amount of data noting accurate perceptions of ETS exposure risks creates optimism that a healthy, ETS-free environment for children is possible.

Theoretical Framework

Several aspects of the Health Belief Model (HBM) guide this research project. Three concepts outlined by the HBM are essential in understanding the importance of risk perception related to children's exposure to ETS. These concepts include perceived susceptibility, perceived severity, and perceived benefit (Figure 1). These concepts are particularly important when considering that behavior change at the individual level is frequently necessary to reduce exposures to environmental toxins such as ETS (Parker, Baldwin, Israel, & Salinas, 2004).

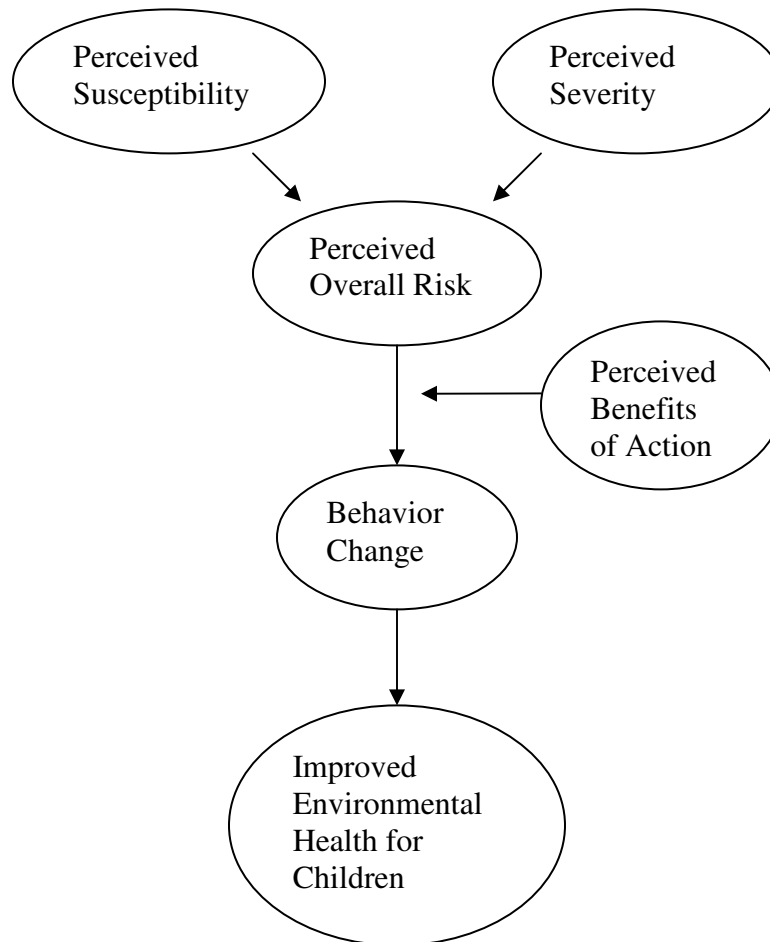
Perceived susceptibility relates to the caregivers awareness of their children's risk for exposure to ETS and subsequent adverse health effects (Janz, Champion, & Strecher, 2002; Parker, Baldwin, Israel, & Salinas, 2004). Caregivers must believe that their children are at risk for exposure to ETS as well as understand the mechanism by which ETS affects children. This necessitates the understanding of the definition of ETS, the components of ETS, as well as concepts relating to body surface area, length of exposure, and normal child growth and development. Caregiver education must focus not only on specific strategies to prevent ETS exposure, but also on adequate knowledge of the risk.

Perceived severity relates to the caregivers awareness of the seriousness of the adverse effects of ETS exposure to children (Janz, Champion, & Strecher, 2002; Parker, Baldwin, Israel, & Salinas, 2004). Caregivers must realize that ETS exposure in childhood can lead to life-long health problems. By associating specific known health effects of ETS to the health of their children, caregivers become empowered to make changes in their households. By fully understanding the risks associated with ETS exposure, caregivers can base their behaviors on informed decisions.

Perceived benefits relate to the caregivers belief that changes in their behavior related to ETS exposure influence the overall health of their children (Parker, Baldwin, Israel, & Salinas, 2004). While caregivers may feel helpless in controlling the larger environment, they can be empowered through education in reducing risks such as ETS in the smaller environment of their home.

The concepts of perceived susceptibility and perceived severity of ETS exposure risk will help health care providers to better understand how to encourage caregiver behavior change to result in risk reduction (Janz, Champion, & Strecher, 2002). While children are considerably more vulnerable than adults are to their environment, they also have less control over the quality of their environment. Caregiver's perceptions of children's risks associated with ETS may be influenced by their awareness of the severity of the risks of ETS exposure as well as their awareness of children's susceptibility to ETS exposure. The HBM suggests that, in order for caregivers to change their behaviors to reduce ETS exposure to their children, they must feel a sense of threat. Understanding the true nature of health threats of ETS to their children, acts as a catalyst for change in caregivers. Interventions that focus on increasing caregivers perceived susceptibility and perceived severity will promote individual behavior change through increased perceived benefits (Parker, Baldwin, Israel, & Salinas, 2004).

Figure 1
Relationship Between Perceived Susceptibility, Perceived Severity, and Perceived Benefits to Behavior Change.



Gaps in the Literature

Much research is available on the topic of ETS exposure and the health risks to children. Less research has focused on promoting specific interventions to reduce these known health effects and improve the quality of life for children (Israel et al., 2005). The volume of research information available on ETS exposure risks and the percentage of children still being exposed to ETS in the home indicates a severe lack of public health education on ETS exposure risk (Winickoff et al., 2003). ETS exposure should be considered a preventable health risk for children, with prevention efforts aimed at caregivers.

CHAPTER 3

METHODS

Introduction

This study is descriptive in nature, summarizing data collected about ETS exposure risks in children and caregiver perceptions of these risks. A cause and effect relationship is not being investigated, therefore independent and dependent variables do not specifically exist. The focused research question seeks to understand how the caregivers of rural dwelling children perceive the children's risk associated with ETS exposure. The data utilized in this descriptive analysis is nested within the larger ERRNIE project. The results of this study will become a subset of data incorporated into the results of the ERRNIE project.

The ERRNIE study is an ongoing collaborative project designed to assess environmental health risks in rural dwelling children and evaluate educational interventions to minimize health risks to children (Hill & Butterfield, 2006; Hill, Butterfield, & Larsson, 2006). The ERRNIE project evaluates five different environmental exposure risks in rural dwelling children including ETS, radon, carbon monoxide, lead, and well water impurities. The ERRNIE project goals are focused primarily on improving environmental health for rural dwelling children by reducing and eliminating common environmental toxins from the home. The necessary interventions are based on data collected from parental surveys and in-home biomarker testing. The ERRNIE data presented in this descriptive analysis focuses on low-income families living in rural areas of Gallatin County, Montana. The data relating to ETS exposure risk

perceptions presented in this report apply specifically to children living in this community.

Definitions

Several definitions are essential in understanding the purpose and implications of this data analysis. The central question guiding this study focuses on rural-dwelling children. Based on 2000 US census data, Gallatin County is designated as rural with more than 6 and fewer than 50 persons per square mile ("Montana Department of Health and Human Services", 2007). Rural classification for the overall ERRNIE study is based on the rural designation of Gallatin County. This study focuses specifically on families with young children, defined as children under the age of six years.

Considering Webster's New World Dictionary's definition of second-hand, second-hand smoke is smoke previously inhaled and exhaled by another person (Neufeldt & Sparks, 1990). Therefore, this study considers smoke from an indirect source, such as the ambient air, to be second-hand smoke. Similarly, inhaling smoke from the ambient air is considered passive inhalation. For this study, environment refers to factors physically external to the person (Parker, Baldwin, Israel, & Salinas, 2004). The definition of ETS and second-hand smoke is: smoke passively inhaled from the environment.

For the purpose of this study, health problems are illnesses and diseases, as well as variations from normal functioning that affect daily life. Health risks are defined, for this study, as potential health problems that may be incurred from exposure to a given hazard. Health risks are only potential problems as their occurrence is not certain, despite

research indicating a strong cause and effect relationship between ETS exposure and specific health problems (Cook, Strachan, & Carey, 1998).

Assumptions

Public knowledge about the health risks of environmental tobacco smoke to children varies (Ashley et al., 1998; Emmons, Hammond et al., 2001; Jochelson, Hua, & Rissel, 2003; Johansson, Hermansson, & Ludvigsson, 2004; Jordan, Price, Dake, & Shah, 2005; McMillen, Winickoff, Klein, & Weitzman, 2003; Winickoff et al., 2003). Children have little or no direct control over their exposure to environmental tobacco smoke. Based on their behaviors, adults have a direct effect on the environment and health of the children in their care. A final assumption for this study is based on the generally altruistic nature of the parent-child relationship. The study assumes that caregivers have the children's best interests in mind.

Target Population

The target population for this ongoing study of environmental risks is rural dwelling children in Gallatin County, Montana. Based on USDA population criteria, Gallatin County holds the designation of rural despite the presence of urban centers within its boundaries ("Montana Department of Health and Human Services", 2007). Additional eligibility criteria include: residence in Gallatin County, minimum of one child under six years of age, use of a private or community well as primary water source, utilization of public health services at Gallatin City/County Health Department (GCCHD), and ability to speak/read English (Hill, Butterfield, & Larsson, 2006). These

requirements, specifically well water usage, restrict the participation to families without city water access, eliminating those living in more urbanized areas of Gallatin County. Restricting participants to those utilizing public health services ensures the inclusion of families with lower socioeconomic status.

Procedures

The ERRNIE project used a referral system as the primary sampling method. The study population is a convenience sample since random selection was not utilized in acquiring participants. A pre-determined number of participants was not set for the study prior to sampling. Referrals from the Gallatin City County Health Department (GCCHD) were the source for initial contact with participants. Only families interested in participation were referred by the GCCHD to the ERRNIE study. Official informed consent was verified with a signed consent form. All eligible families referred from the GCCHD participated in the study. The study utilized the largest possible number of participants that fit the criteria.

Families were first approached by health care workers at the community based GCCHD for participation in the ERRNIE project. Families willing to participate were then contacted by telephone by ERRNIE staff members to confirm eligibility, explain the project, and schedule a home visit (Hill, Butterfield, & Larsson, 2006). Data on environmental exposure risk and risk perception was gathered using questionnaire format. Data relating to children's ETS exposure risk and caregiver perceptions was collected directly from caregivers through the survey. Data on actual exposure to

environmental hazards was collected through various scientific sampling techniques specific to each toxin evaluated.

Measurement

Subjective data regarding caregiver's perceptions of their children's risk for exposure to ETS was collected through a booklet questionnaire. The survey was mailed to each participant household prior to the home visit. A designated adult respondent in each household completed the survey (Hill, Butterfield, & Larsson, 2006). The surveys were collected during the home visit by ERRNIE staff resulting in a 100% return rate. The 24 page questionnaire includes basic demographic questions as well as a comprehensive survey of environmental risks and risk perceptions related to all five environmental exposures included in the ERRNIE study.

Two questions determine whether cigarette smoking is present in the home, and if so how many individuals smoke in the household. Eight questions relate specifically to risk perceptions related to ETS exposure. These eight questions are scored on a 7-point scale with a range from strongly disagree to strongly agree. Four questions elicited information regarding general risk for children's exposure to ETS (Table 1). This data reflects directly on the caregiver's perceived susceptibility of their children to ETS exposure. Determining the perceived susceptibility is the first step in analyzing this data based on the HBM.

Table 1
Statements Evaluating Perceived Susceptibility to ETS Exposure (Butterfield, 2003)

1.	Children in Gallatin County are at risk for being exposed to indoor tobacco smoke.
2.	Our children are at risk for being exposed to indoor tobacco smoke.
3.	Indoor tobacco smoke is a serious problem for our children.
4.	Our children are at risk for having health effects due to tobacco smoke.

Using the same 7-point scale, respondents were asked to rank their response to four questions related to their perception of the severity of ETS exposure for children (Table 2). These questions were designed to assess the respondent's awareness of the effects of ETS exposure. Perceived severity can be evaluated in conjunction with perceived susceptibility to determine caregiver's perceived threat of ETS exposure to their children (Janz, Champion, & Strecher, 2002).

Table 2
Statements Evaluating Perceived Severity of ETS Exposure

1.	Health effects due to tobacco smoke are likely to be serious.
2.	Being around less tobacco smoke would improve the long-term health of my children.
3.	Being around less tobacco smoke would mean fewer colds and infections for my children.
4.	Being around less tobacco smoke would mean lower medical expenses for our family.

CHAPTER 4

RESULTS

Introduction

This descriptive analysis uses SPSS version 16 to address research questions relating to caregiver perceptions of risk associated with ETS exposure in children.

The focused research questions include:

- How do caregivers perceive their children's susceptibility to ETS exposure?
- How do caregivers perceive the severity of health risks for their children associated with ETS exposure?

Two factors pertinent in the HBM guide the analysis of these questions: perceived susceptibility and perceived severity. The analysis is divided into two sections according to these aspects of the HBM.

Sample Description

A summary of participant demographics is provided in Table 3. The data was gathered from 31 caregivers (n=31) living in Gallatin County (Hill, Butterfield, & Larsson, 2006). The majority of adult respondents were married, Caucasian females between the ages of 21-40 (Hill, Butterfield, & Larsson, 2006). Additionally, 58% of respondent households were either uninsured or receiving Medicaid, and 68% of families reported total household income per year less than \$35,000 (Hill, Butterfield, & Larsson, 2006).

Table 3
Sociodemographic Description of Family Participants

	Participants (n=31)	Sample (%)
Age (years)		
21-30	20	64.5
31-40	9	29.0
41-50	0	0
50+	2	6.5
Ethnicity		
Caucasian	30	96.8
Hispanic or Latino	0	0
Black/African American	0	0
American Indian or Alaskan Native	1	3.2
Other	0	0
Marital status		
Married	21	67.7
Divorced/separated	2	6.5
Widowed	0	0
Never married	3	9.7
Living with partner	5	16.1
Education (no. of years of school completed)		
12 or less	12	38.7
13-15	11	35.5
16-18	8	25.8
19 or greater	0	0
Income		
<\$10,000	5	16.1
\$10,000-19,999	4	12.9
\$20, 000-24,999	3	9.7
\$25,000-34,999	9	29.0
\$35,000-45,999	6	19.4
\$46,000-54,999	0	0
\$55,000 or greater	4	12.9
Health Insurance		
None	12	38.7
Medicaid	6	19.4
Private health insurance	10	32.3
“Other”	3	9.7

Adapted from (Hill, Butterfield, & Larsson, 2006)

Perceived Susceptibility

Four items measure perceived susceptibility, and for each statement, the possible responses range from 1 – strongly disagree to 7- strongly agree (Table 4). A mean score of 5.58 (sd 1.48) was calculated for the item – “Children in Gallatin County are at risk for being exposed to indoor tobacco smoke”. This average score indicates that, overall, respondents “slightly agree” with this statement. A mean score of 3.32 (sd 2.17) was calculated for responses to the second statement – “Our children are at risk for being exposed to indoor tobacco smoke”. This average score indicates that, overall, respondents “slightly disagree” with this statement. A mean score of 3.10 (sd 2.09) was calculated for the third item – “Our children are at risk for being exposed to indoor tobacco smoke”. This average score indicates that, overall, respondents “slightly disagree” with this statement. For the fourth item – “Our children are at risk for having health effects due to tobacco smoke”, a mean score of 3.32 (sd 2.02) was calculated for responses to the fourth statement. This average score indicates that, overall, respondents “slightly disagree” with this statement.

Table 4
Caregiver Perceptions of Children’s Susceptibility to ETS Exposure (n = 31)

	Range	Mean	Standard Deviation
Children in Gallatin County are at risk for being exposed to indoor tobacco smoke	1-7	5.58	1.478
Our children are at risk for being exposed to indoor tobacco smoke	1-7	3.32	2.166
Indoor tobacco smoke is a serious problem for our children	1-7	3.10	2.087
Our children are at risk for having health effects due to tobacco smoke	1-7	3.32	2.023

Perceived Severity

Four items measure perceived severity, and for each statement, the possible responses range from 1 – strongly disagree to 7- strongly agree (Table 5). A mean score of 5.63 (sd 1.79) was calculated for the item – “Health effects due to tobacco smoke are likely to be serious”. This average score indicates that, overall, respondents “slightly agree” with this statement. A mean score of 5.30 (sd 1.88) was calculated for responses to the second statement – “Being around less tobacco smoke would improve the long-term health of my children”. This average score indicates that, overall, respondents “slightly agree” with this statement. A mean score of 4.73 (sd 1.84) was calculated for the third item – “Being around less tobacco smoke would mean fewer cold and infections for my children”. This average score indicates that, overall, respondents “neither agree or disagree” with this statement. For the fourth item – “Being around less tobacco smoke would mean lower medical expenses for our family”, a mean score of 4.23 (sd 1.91) was calculated for responses to the fourth statement. This average score indicates that, overall, respondents “neither agree or disagree” with this statement.

Table 5
 Caregiver Perceptions of Severity of ETS Exposure for Children (n = 31)

	Range	Mean	Standard Deviation
Health effects due to tobacco smoke are likely to be serious	1-7	5.63	1.790
Being around less tobacco smoke would improve the long-term health of my children	1-7	5.30	1.878
Being around less tobacco smoke would mean fewer cold and infections for my children	1-7	4.73	1.837
Being around less tobacco smoke would mean lower medical expenses for our family	1-7	4.23	1.910

The general scores reflected in these measures of perceived susceptibility and perceived severity indicate that health literacy regarding ETS exposure risks is moderate in this population. According to the data, caregivers have a skewed concept of susceptibility believing that other children are at far higher risk than their own. Although the respondents indicated some concern about the detrimental effects of ETS on the health of children, this was not high.

CHAPTER 5

DISCUSSION

Introduction

The results of this study provide insight into the two pertinent research questions. By addressing these questions, this study assesses perceptions of caregivers in Gallatin County in relation to susceptibility and severity of ETS exposure in children. This information may guide health education efforts based on increasing perceived threat in order to elicit behavior change in caregivers of children.

Children's Susceptibility to ETS Exposure

The first question addressed in this study is “how do caregivers perceive their children's susceptibility to ETS exposure?” Average scores relating to perceived susceptibility were somewhat lower than those for perceived severity. This reflects that although caregivers sense that ETS is harmful, they do not perceive an exposure risk for their own children. This may in turn reflect a knowledge deficit regarding the nature of true exposure or may indicate a true case of non-exposure. Mean scores indicate that caregivers agree to some extent that children in Gallatin County are at risk for ETS exposure. On the other hand, mean scores for the three other measures of susceptibility (Table 4) indicate that caregivers do not believe that their own children are at risk for exposure or for health risks from exposure.

Severity of Health Risks from ETS Exposure

The second research question addressed in this study is “how do caregivers perceive the severity of health risks for their children associated with ETS exposure?” The finding that most parents reported a weak association between ETS exposure and detrimental health effects may be related to several factors. First, low ratings on measures of severity may reflect a general knowledge deficit on effects of ETS exposure. It also suggests the possibility that caregivers do not have enough knowledge to make the connection between poor health and ETS exposure. These findings correlate with previous research suggesting that although vast amounts of information is available describing the health risks of ETS exposure, the general population does not understand these risks. Another possibility explaining the disconnect between true health risks and perceived risks of ETS exposure is the concept of caregiver denial. This considers the prospect that while caregivers may perceive some risk associated with ETS exposure, they may deny that their actions directly impact their children’s health.

Implications for Advanced Nursing Practice

While great improvements in public awareness and public restrictions on smoking are apparent in the US, it is still important to consider the fact that much ETS exposure occurs in the home or private dwelling where children spend much of their time (Cook & Strachan, 1999). According to the HBM that guides this study, caregivers must directly link their children’s susceptibility to the effects of ETS with the severity of the adverse health effects in order to perceive a true threat. Perception of threat is necessary to promote behavior change that improves the quality of children’s living environments.

Caregivers are capable of updating their personal risk assessments based on new information. New information will be incorporated with previous knowledge to reorganize their risk perception, potentially leading to behavior change (Poe, van Es, VandenBerg, & Bishop, 1998). Implications for advanced nursing practice lie primarily in health education.

Reemphasizing the risks of ETS exposure and the importance of minimizing this exposure at visits for illnesses as well as during well child check-ups may provide knowledge to motivate caregivers to reduce exposures or smoking cessation for the benefit of their children (Little, 1995). Education must emphasize risks and consequences of exposure, encourage self-efficacy in order to promote behavior change, improve awareness of factors increasing dose related exposure such as indoor and in-car smoking in the presence of children (Crone, Reijneveld, Burgmeijer, & Hirasing, 2001).

Educational materials geared toward encouraging parents to limit or avoid ETS exposure for their children should not be limited to public health departments, but instead should be available community-wide. Family Nurse Practitioners practicing in a variety of settings including Urgent Care clinics, School Health Fairs, Primary Care offices, as well as community based health department clinics have the opportunity for family education. In this age of increasing environmental toxicity, empowering caregivers to provide healthy microenvironments for their families is essential. Enabling children to grow up in an environment with minimal health risks is an essential building block for healthy living and environmental health consciousness in future generations.

Limitations

This study includes a variety of limitations. First, the study focuses on health risks for children, although the literature and data evaluation focuses on perceptions of adults caregivers. Adult perceptions on this topic may directly affect the environmental health of children. The study is limited to adults who are caregivers of children younger than six years old but not necessarily parents. Since the primary caregiver is not always the parent, this limitation also expands the study. The small sample size limits the generalizability of the results, as does convenience sampling. Since the participants were referred from the GCCHD, this captures a portion of the rural low-income families, but excludes low-income families not seeking public assistance or public health services. This study, like other human based studies, is limited by sole inclusion of individuals willing to participate in the study, eliminating an unknown portion of any population.

Recommendations for Future Research

This initial study is a step forward in the larger ERRNIE research project evaluating risk perceptions of ETS exposure and true health risks for children. Future research will focus on a larger sample size as well as an expanded geographic sample range. It will also include interventions directed at modifying risk perceptions.

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