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The Effects of a Maternal Childhood Lead-Poisoning Education Program on Knowledge, Health Beliefs, and Compliance

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THE EFFECTS OF A MATERNAL CHILDHOOD LEAD-POISONING EDUCATION PROGRAM ON KNOWLEDGE, HEALTH BELIEFS, AND COMPLIANCE

by

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ABSTRACT

THE EFFECTS OF A MATERNAL CHILDHOOD LEAD-POISONING
EDUCATION PROGRAM ON KNOWLEDGE,
HEALTH BELIEFS, AND COMPLIANCE

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The purpose of this study is to determine the effects of two educational intervention methods on participant's knowledge, health beliefs and prevention behavior as they relate to childhood lead poisoning. The two educational methods being used in the study are personal instruction by the investigator and a 12-minute video developed by the American Academy of Pediatrics on childhood lead poisoning. Information contained in both educational tools is identical. In particular, this study seeks to determine if one educational intervention was more effective than the other. The final purpose of the study is to test the Health Belief Model by examining the effects of knowledge and health beliefs on prevention at posttest in both groups. The study employs an adapted version of Russell's (1991) Childhood Injury Prevention Instrument which was developed using constructs of the Health Belief Model.

The sample of 50 women was 94% African American, 4% Caucasian and 2% other race individuals. The majority of the sample (64%) report a total family income of under $10,000 per year. Approximately 82% of the sample are unmarried and 38% report having at least a high school education. Most of the subjects were between 19-24 years of age (34%). All of the participants utilize Women and Infant Children (WIC) clinics within the local health department.

Overall, the study finds a statistically significant difference in pre and post prevention behavior at $p < .05$ within each intervention group. An increase in posttest knowledge is also shown to be statistically significant at $p < .05$ within each group. Only two subscales of the Health Belief Model are shown to be statistically significant at $p < .05$ at posttest: perceived seriousness and perceived barriers. No differences are seen between the two types of instruction received on prevention behavior, knowledge or health beliefs. Finally, knowledge and health beliefs were not found to be predictors of compliance at posttest.

DEDICATION

This work is dedicated to my parents, Herbert and the late Annie Johnson and my brothers, Kenneth, Mike, Anthony. My parents taught me a lot of what I needed to know about life and the world. Although my mother passed away during my pursuit of this goal, she continues to be a source of inspiration to me throughout this process. My family has always pushed me to succeed at whatever I chose to do, and for that I am thankful. Over the years, they made tremendous sacrifices so that I could reach this goal. I will always appreciate their patience and belief in me. I thank them for all of the emotional and financial help they have given me along the road to completing this degree. I will always be indebted to my family for the commitment they made to me at the beginning of this endeavor. I am thankful for their guidance, support and most of all, their love.

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CHAPTER 1

INTRODUCTION

Background

Childhood lead poisoning is considered the most serious health threat to children in the United States today (Centers for Disease Control, 1991). According to the Centers for Disease Control (CDC), millions of children are considered at risk for childhood lead poisoning because they live in houses or apartments built before the residential use of lead-based paints was banned by the Consumer Product Safety Commission in 1978. The cost for medical treatment of lead poisoned children is difficult to determine due to the varying treatment required depending upon the blood lead level. However, it is estimated that society pays $4,000 per year per child to meet the special education needs of lead poisoned children E.M. Mannix (personal communication, March 13, 1997). Lead-based paint continues to be the most common high-dose source of lead exposure in young children (CDC, 1991; National Research Council, 1993). Among inner-city, low-income families living in older dwellings, the problem is particularly acute.

Within the city of Norfolk, Virginia, where the present study was conducted, more than 500 properties constructed before 1950 are estimated to have children under age six residing in them (Norfolk Department of Health, 1994). Such properties are almost certain to contain lead-based paint, thus putting the children who live in them at risk.

That risk is multiplied throughout the United States. Nationally, it is estimated that more than 3 million children between the ages of 6 months and 5 years of age have blood lead levels higher than 15 μg/dL (CDC, 1991). Health authorities are concerned about these figures, because research has shown that a child's physical and mental development is reduced when blood lead levels are as low as 10 µg/dL(Needleman, Schell, Bellinger, Leviton, & Allred, 1990).

Before the 1978 ban, both the interior and exterior of large numbers of buildings were routinely painted with lead-based paint. In homes constructed during the 1940s and 1950s, lead-based interior paint was commonly used on kitchen and bathroom walls, window sills, doors, and wooden trim—many such surfaces being easily accessible to children, thus placing them at greater risk (Environmental Protection Agency, 1990). Children now living in these older structures may be exposed to lead by ingesting paint chips or paint-contaminated dust or soil. In some cases, exposure to lead may occur because necessary and proper precautions have not been taken while homes containing lead-based paint are being remodeled.

Because children tend to engage in hand-to-mouth play activities, they are particularly at risk for lead poisoning. This is especially true for children 6-18 months of age. At this stage of their development, they begin to crawl and then walk. With this mobility comes the likelihood that they will touch surfaces and toys covered with lead dust. Since children have a tendency to put their hands in their mouths frequently, this is a direct source of exposure. When a child swallows food, soil or anything else that has become coated with lead dust, a quantity of lead enters the blood stream and moves to other parts of the body (Agency for Toxic Substances and Disease Registry, 1990).

Prior to 1975, a blood lead level of 40 µg/dL was used as the standard for defining a lead poisoning "case." In 1975 and 1978, revisions were made to the existing criteria and 30 µg/dL became the level at which a case was defined. By 1985, the standard was further reduced to 25 µg/dL (National Research Council, 1993).

However, data collected since 1985 have shown that lead levels lower than 25 µg/dL can impair cognitive and physical development (Needleman, et. al., 1990, Fulton, et. al., 1987; Hansen Trillingsgaard, Beese, Lyngbye, & Grandjean, 1989; Winneke, Brockhaus, Ewers, Kramer, & Neuf, 1990). Following a recommendation of the EPA Science Advisory Board, the level of concern for childhood lead poisoning was reduced to 10 µg/dL in 1991 (EPA, 1990).

The health effects of elevated lead body burden in children include delayed physical and mental development (Needleman, et.al.,1990). More recently, increased lead body burden has been associated with delinquent and antisocial behavior (Needleman, Reiss, Tobin, Beiseckerr, & Greenhouse, 1996). While concern over the relationship between lead body burden (amount of lead stored by the body) and IQ is a valid one, a more important concern is whether the damages are reversible when identified and treated (Needleman, et.al., 1990). *Healthy People 2000* has identified as one of its goals a reduction in the prevalence of blood lead levels greater than 15 µg/dL among young children between 5 months and 6 years of age to no more than 500,000. Another objective of this initiative is to bring down to zero the number in this age group who have lead levels greater than 25µg/dL (Healthy People 2000, 1990).

Purpose of Study

This study was undertaken to determine whether educating mothers on the health hazards of childhood lead poisoning, using two different interventions, has any effect on their health beliefs, knowledge, and compliant behavior. More specifically, the study seeks to investigate whether or not personal instruction is more effective than video instruction. Finally, the study seeks to test the Health Belief Model, which contends that knowledge and health beliefs predict compliant behavior.

Rationale for the Study

The current study is important for two reasons: (a) childhood lead poisoning is a serious and preventable disease, and acquiring information on preventing it is a necessary step in solving the problem; and (b) although numerous recommendations have been made on ways to reduce childhood lead poisoning, little exists in the literature suggesting that these recommendations have been evaluated.

Two other considerations are these (a) anti-social behavior has been found to be associated with increased lead levels (Needleman, et. al., 1996)—a finding with a number of implications that could directly impact society; and (b) childhood lead poisoning continues to disproportionately plague low-income minority populations—populations that have largely gone underserved by the health care system. Thus, it is imperative that attention be given to this disease.

The Centers for Disease Control (CDC) has outlined a number of strategies to reduce the number of lead poisoned children in the United States. One such strategy is to educate parents on the health hazards of lead. More specifically, the CDC recommends that parental lead education programs include the following information: (a) the causes and effects of lead poisoning, (b) the relationship of the child's blood lead level to potential adverse health effects, (c) need for follow-up blood tests, (d) possible sources of lead intake, (e) means for reducing sources of lead, and (f) the role of nutrition in decreasing lead absorption. Ideally, according to the Centers for Disease Control (1991), this information should be provided to parents in a face-to-face setting. CDC further recommends that an emphasis on the major preventable sources of high-dose lead poisoning be included in the educational program. These sources include lead-based paint and take-home exposures —those sources of lead exposure that are brought home from parents' occupations and hobbies. While CDC has made recommendations on the importance of educating parents on the dangers of childhood lead poisoning, little research has been done that evaluates the effectiveness of health education programs on childhood lead poisoning.

It can be assumed that a considerable number of children who reside in the city of Norfolk are at risk of lead poisoning, since, as stated earlier, more than 500 pre-1950 properties are still occupied by families with children under age six. Thus, the importance of educating parents or guardians on preventing lead poisoning cannot be overstated.

In addition to the fact that lead removal from a property requires that individuals at risk (pregnant women, children, and adults with high blood pressure) relocate during renovations, the process is expensive and time-consuming. Unfortunately, many of the individuals who reside in these homes with lead-based paint are not in a financial position to defray the costs involved in removing the lead. These properties often are low-rent dwellings. Landlords are often unwilling and financially unable to delead these properties. Thus, numerous inner-city low-income children remain at risk for this totally preventable disease. Recently, however, a new law, *Title X* was implemented. This law essentially requires landlords to inform potential tenants about lead-based paint and give them the results of any lead tests that may have been performed on the dwelling. The parents or guardians must also be given a pamphlet by the landlord entitled *"Protect Your Family From Lead in Your Home"*(HUD, 1996).

Urban Significance

Lead has been found at disproportionately higher levels in inner city urban dwellings that were built in the 1950s—an era when lead was not only commonly used as a base for paint but also as a solder in plumbing (U.S. Housing & Urban Development, 1990). In urban areas contaminated by lead-based paint and previous atmospheric fallout of lead additives to gasoline, lead concentrations in soil and interior and exterior dusts have been monitored for a number of years.

The Housing and Urban Development agency currently has guidelines to address public and Indian (Native American) housing. These guidelines provide methods of identifying and abating lead-based paint. Many of the public housing units constructed during the time when lead was commonly used as a base in paint are still being lived in today. What is often referred to as "urban decay" has compounded the problem, because, as large numbers of middle- and high-income individuals and families have left cities, low-income and minority populations have had no choice but to remain in the inner city. It is they who now face the challenge of dealing with lead while lacking the economic resources for meeting that challenge.

Finally, because an elevated lead level has been associated with aggressive behavior, (Needleman, et. al., 1996) the threat of childhood lead poisoning has yet another implication: urban crime. This recent finding suggests that lead poisoning could indirectly impact upon urban crime rates.

Assumptions

The research was conducted with the assumption that participants would answer all questions honestly and that their participation in the study would be voluntary. In addition, mothers were assumed to be the primary caretakers of the children. As such, it was assumed that maternal health beliefs and knowledge of childhood lead poisoning would determine the actions to be taken in seeking health care for their children. Finally, it was assumed that the caretaker was interested in the well-being of their child.

Limitations:

As with any study, there are limitations. For the current study, the small sample size decreases the ability to generalize to larger populations. Another limitation of this study is the short length of time (one month) between pretest and posttest administration, and it is not known if knowledge and attitude changes will persist over a longer time period.

A methodological issue associated with self-reported outcome measures lies in the ability to recall behavior. Another problem is the inability to directly observe participants' behavior. A final limitation of the study is the lack of a control group. In the absence of a control group, it is difficult to assure that any of the observed attitude and behavior changes can be attributed to the intervention rather than some other factor or activity in the community.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Childhood lead poisoning is a complex issue with numerous components and considerations. While the CDC has developed guidelines and recommendations on necessary actions to eliminate childhood lead poisoning, little exists in the literature that addresses the effectiveness of these recommendations. In order to understand the magnitude of the problem, several pieces of the literature had to be visited. The review will address the following: health effects, sources of exposure, environmental case management, treatment methods, and prevention strategies (both primary and secondary). Emphasis will be placed on secondary prevention strategies particularly, health education programs and their effectiveness. Information will be provided on studies that utilized the Health Belief Model as a conceptual framework. Since childhood lead poisoning continues to afflict inner-city low-income minority children, the effectiveness of health education programs with these populations will also be a topic of focus. In addition, attention will be given to the usefulness of video instruction in health education programs as well as a comparison of the effectiveness of video versus personal instruction

Health Effects

While little is known about whether or not lead-related deficits are irreversible, a study by Needleman, Schell, Bellinger, Leviton & Allred (1990) reported that the educational achievement of a group of young adults was inversely related to the amount of lead deposited in the teeth they had shed as first and second graders. The study concluded that dentin levels greater than 20 parts per million (ppm) were correlated with as much as a seven-fold risk of not graduating from high school. The study further revealed a six-fold risk of having a reading disability, greater absenteeism, and lower class ranking.

During the 1980s, numerous prospective studies were conducted in an attempt to deal with the limitations of cross-sectional studies. Blood lead levels were taken during the prenatal period and continued for many years. An assessment of development was also documented. In some of the studies (Bellinger, Leviton, Waternaux, Needleman, & Rabinowitz, 1987; Bellinger, et al., 1991; Dietrich, Succop, Berger, Hammond, Bornschein, 1991; and Earnhart, Wolf, Kennard, Erhard, Filipovich and Sokol, 1986), prenatal exposures were associated with reduced sensory-motor skills and delayed early cognitive development. According to Bellinger, et al., (1991), proper postnatal care and favorable socioeconomic conditions may lessen some of these early associations. A study by Ruff, Bijur, Markowitz, Yeou-Cheng and Rosen (1993) supports this notion. The authors found an association between reduced lead body burden and improved cognitive skills. Other studies (McMichael, Baghurst, Wigg, Vimpani, Robertson, & Roberts 1988; Bellinger et al., 1991) have suggested that cognitive performance during the preschool years may be associated with early postnatal lead exposure. The 1985 standard has since been re-evaluated, and as of October 1991, a blood lead level of 10 µg/dL was set as the level of concern (CDC, 1991).

Sources/Pathways of Lead Exposure

Lead-based paint

Children are exposed to lead by a number of environmental sources, including paint, gasoline and lead solder found in plumbing. However, according to the CDC (1991), lead-based paint is the most problematic and common high-dose source of lead exposure in pre-school children. CDC further estimates that some 74% of privately owned, occupied housing in the United States, constructed prior to 1980, contain lead-based paint (CDC, 1991). Lead removal from homes is important for both the treatment of poisoned children and for the primary prevention of childhood lead poisoning (Measuring lead exposure in infants, children and other sensitive populations, 1993).

Pica, the ingestion of non-food substances, has been linked in cases of lead-poisoned children (Needleman, 1980). It is noted, however, that a child does not have to eat paint chips to realize lead poisoning. In many instances, children ingest dust and soil contaminated with lead from paint that flaked or chipped during the aging process or was disturbed during renovations. In fact, lead-contaminated house dust, ingested by normal hand-to-mouth activity, is now recognized as a major contributor to the total body burden of lead in children (Bornschein, et al., 1986).

Soil and Dust

Soil and dust act as pathways to children for lead deposited by primary lead sources such as lead paint, leaded gasoline and industrial sources. As lead does not break down, lead deposited in soil remains a constant source of exposure to children. For example, according to the Agency for Toxic Substances and Disease Registry (ATSDR) (1988), although the use of leaded gasoline has been banned, 4-5 million metric tons of lead used in gasoline still remain in dust and soil, thus continuing to pose a threat to children.

During normal play and hand-to-mouth activities, young children may inhale or ingest lead from soil or dust. Ingestion of dust and soil during playtime activities appears to be a more pronounced means of exposure (EPA, 1990). The relationship between household lead-contaminated dust and the blood lead levels of urban children has been shown to be a contributing factor to lead body burden (Lanphear, et al., 1996). This study by Lanphear, et al., involved 205 children 12 to 31 months of age. Household dust, water, soil, and the child's blood lead levels were analyzed for lead. Findings indicated that children may have blood lead levels of 10 μg/dL when dust levels in their homes are below the current EPA standard of 100 μg/sq ft for floors, 500 μg/sqft for interior window wells and 800 μg/sq ft for window wells.

Drinking Water

Contamination of drinking water can occur at several points, including lead connectors, lead service lines or pipes, lead-soldered joints in copper plumbing, lead-containing water fountains and coolers, and lead-containing brass faucets and other fixtures. Typically, lead pipes are found in residential dwellings built prior to the 1920s. Pipes made of copper and soldered with lead came into general use in the 1950s. Lead, leaching from copper pipes with lead-soldered joints, is the major source of water contamination in homes and public facilities such as schools.

In general, lead in drinking water is not the main source for poisoned children. There are instances, however, where lead levels in drinking water are unusually high. Some water cooler/fountains still have lead-soldered or lead-lined tanks. Measures to reduce exposure in drinking water include using fully-flushed water for drinking and cooking (CDC, 1991).

Occupations and Hobbies

Children may suffer exposure to high lead levels when workers take home lead on their work clothing, or when they bring home waste material from work. Other activities that may be linked to lead exposure include shooting at an indoor firing range, doing home repairs, remodeling, and making pottery (CDC, 1991).

Food

Lead-soldered, side-seam cans have been potential sources of lead exposure. However, by 1989, the use of lead-soldered cans (in the U.S.) declined. There still exists a possibility of exposure via foods stored in cans and imported into the United States. Lead in foods can also occur as a result of foods being grown in lead- contaminated soil.

In addition to these pathways for exposure, there are ways in which the lead content of food is increased during the handling process. For example, foods should not be stored in unopened, lead-soldered cans for more than a year. Food should not be stored in opened cans, even if refrigerated. The only types of containers that foods should be stored in are those that do not release lead (i.e., glass, stainless steel, or plastic). Leaded crystal should not be used to store food; and, if ceramic food containers are used for storage, lead-free glazes should be used in the preparation of the ceramics (CDC, 1991).

Prevention Strategies

Health professionals agree that both primary and secondary prevention strategies are necessary when addressing the lead exposure problem in the United States. To date, the most viable primary prevention strategies are lead abatement (removing lead to reduce exposure by removing, enveloping or scaling off painted surfaces), educating parents on preventing exposure in young children, and soil and exterior dust removal. Secondary prevention strategies include educating parents on ways to reduce and manage exposure to lead in a child with elevated blood lead levels, improving nutrition, blood screening and administering chelating agents to increase lead excretion (CDC, 1985).

Primary Prevention Strategies

Lead Abatement

Lead-based paint may be abated by removing the paint and any parts that lie beneath it. Disposal of the paint chips and the substrate requires the use of an approved landfill. Removal may take the form of scraping, scraping with a heat gun, abrasive removal, removal with a needle gun, on-site chemical stripping or off-site chemical stripping.

Other abatement methods include enclosure and encapsulation (EPA, 1991). Enclosure involves enveloping the painted surface with a durable substance such as drywall, paneling, metal or siding. Encapsulation typically involves coating or sealing the lead-based paint with some durable casing which is applied as a liquid to the painted surface.

According to the EPA, (1990) lead from long-term exposure may be present in furnace ducts, air conditioning systems, attics, basements, carpets, bare floors, upholstered furniture, curtains, drapes and wall hangings. As such, it may be impossible to remove lead from some areas.

While deleading a home is a practical and effective primary prevention strategy, consideration must be given to the way in which the lead is removed. Farfel and Chisolm

(1990) contend that if the leaded paint is removed properly, a child's exposure may be reduced. The authors found that the reverse is true when the removal process is done improperly.

Soil and Exterior Dust Removal

Soil and dust abatement are usually done simultaneously because they will likely occur together. The removal and replacement of contaminated soil is often used when soil has been found to contain toxic materials. Methods of abatement that actually remove lead from the soil are still being developed. The alternative to removing lead from soil has been exposure-reduction methods. These methods include covering the contaminated soil with lead-free top soil and grass seed or other vegetation. These solutions may also be combined with landscaping improvements (EPA, 1991).

While removal and replacement are most commonly used, there is the possibility of mixing soil containing moderately high levels of lead with soils that have low levels of lead. Current soil-lead-abatement methods that are being considered may provide alternative abatement procedures in the future. Such methods may involve extraction of the lead from the soil or encapsulation so as to avoid human uptake (EPA, 1991).

Parental Education

A final primary prevention strategy that is useful in preventing childhood lead poisoning is educating parents of children under six years of age on the most common sources of lead contamination and how to protect their child(ren) from exposure. Educational programs aimed at informing parents about preventing exposure from occurring should include several components. The CDC (1991) recommends that intact lead based paint should be left alone as it poses more of a health threat when scraped from the walls. In fact, studies have shown that when lead is removed improperly, a child's exposure to lead is increased (Farfel and Chisolm, 1990).The hiring of a professional abatement company is recommended when lead-based paint requires removal. Other prevention strategies include (a) planting shrubbery along the exterior walls of the home so as to keep children from playing in the soil along the sides of the house; (b) running tap water for 90 seconds before using it because standing water usually contains higher levels of lead; (c) controlling dust and paint chip debris; (d) preventing the children from eating dirt; (e) changing work clothes and cleaning up before going home (for those parents or guardians who work in environments where lead exposure occurs); and (f) avoiding hobbies that involve the use of materials that contain lead. These recommendations are essential in planning health education programs aimed at preventing lead poisoning in children.

Secondary Prevention Strategies

Screening

In the past, the main objectives for screening a child for lead poisoning were to identify asymptomatic lead poisoned children and to provide treatment as soon as possible. The shift has now been in the direction of primary prevention. Screening is important in ensuring that lead-poisoned children are identified thus enabling the public health community to develop prevention/intervention strategies (National Rèsearch Council, 1993).

The only way to conduct lead screening is through a blood test. Children between the ages of six months to six years living in deteriorated housing built prior to 1960, are especially at-risk and should be screened. Also, those children in this age group who live in pre-1960 homes that are being renovated or remodeled should be screened. Blood lead level test results determine how frequently the child should be screened following the initial test (CDC, 1991).

Screening can be conducted by the primary care physicians' office and/or at the local health department. Depending upon resources and type of blood test used, sensitivity of test procedures may vary.

Measurement of blood lead levels is the primary screening method. Venous blood samples are preferred over capillary samples. Contamination is often a problem in capillary blood samples. However, contamination collected via a finger prick can be minimized if personnel follow proper techniques (i.e. use of gloves, requiring that child washes his/her hands prior to needle stick, cleaning area of finger with an alcohol swab). If a child's blood level is shown to be elevated (greater than 10 µg/dL) as a result of a capillary test, the test should be repeated using venous blood.

A blood lead level of greater than 10 µg/dL constitutes lead poisoning. If a child measures 10 µg/dL to 14 µg/dL, parents should receive information to decrease exposure to lead-containing dusts. At levels greater than 20 µg/dL, intense environmental and medical interventions should occur (CDC, 1991).

The CDC recommends that beginning at 6 months of age and at regular office visits thereafter, pediatricians should discuss childhood lead poisoning and assess the child's risk for exposure. This risk exposure assessment can be conducted by using a recommended CDC questionnaire to determine risk. The questions are as follows:

Does your child

1. Live in or regularly visit a home with peeling or chipping paint built before 1960? This could include a day care center, preschool, the home of a babysitter or a relative, etc?

2. Live in or regularly visit a house built before 1960 with recent, ongoing, or planned renovation or remodeling?

3. Have a brother or sister, housemate or playmate being followed or treated for lead poisoning (that is, blood lead greater than or equal 15 μg/dL)?

4. Live with an adult whose job or hobby involves exposure to lead?

5. Live near an active lead smelter, battery recycling plant or other industry likely to release lead?

Any child for whom any one of these five questions is answered "yes" is considered to be at high risk to lead exposure. A child answering no to all five questions is presumed to be at low risk (CDC, 1991; Massachusetts Department of Health, 1991).

Even if answers to the questionnaire indicate that the child is not at high risk for high-dose exposure, the child should still be screened when 1 year old and again at 2 years of age. If the 1 year blood lead result is 10-14 μg/dL, the child should be retested every 3 to 4 months. After 2 consecutive measurements of less than 10 μg/dL (or three consecutive measures are less than 15 μg/dL), the child should be retested in a year. If any blood lead test result is greater than or equal to 15 μg/dL, individual case management is required. This involves having the child retested every three to four months.

If it is determined from the questionnaire that the child is at risk for high-dose lead exposure, the child should be screened starting at 6 months of age. If the initial blood lead result is less than 10 μg/dL, the child should be rescreened every 6 months. After two consecutive blood lead levels of less than 10 μg/dL or three measurements less than 15 μg/dL, testing can be conducted annually. If a blood lead test is between 10 and 14 μg/dL, the child should be screened every 3 to 4 months. When 2 consecutive measurements are less than 10 µg/dL or three are less than 15 µg/dL, testing can be reduced to once a year. If any blood lead test result is greater than or equal to 15 µg/dL, again, the child requires individual case management which includes retesting the child at least every 3 to 4 months. For children previously at low risk, any instance suggesting an increased lead exposure should be followed up with a blood lead test (CDC, 1991).

The questionnaire should also be administered to parents of children between 3 and 6 years of age. For these children, the questionnaire is important in that children in this age group are typically involved in hand-to-mouth activities while playing, which places them at risk of ingesting lead dusts. Those children with a venous blood test greater than or equal to 15 µg/dL or who are at high risk by the questionnaire or have not been previously tested should be screened at least once a year until their sixth birthday. If the blood lead level is between 15 and 19 µg/dL, the child should be screened every 3-4 months, the family should also be given education and nutritional counseling and a detailed environmental history should be taken to identify any obvious sources or pathways of lead exposure. When the venous blood lead level is in this range, two consecutive tests 3-4 months apart, environmental investigation and abatement are highly recommended if resources permit. If the blood lead level is greater than or equal to 20 µg/dL, the child should be given a repeat test for confirmation. If the venous blood lead level is confirmed to be greater than or equal to 20 µg/dL, the child should be referred for medical evaluation and follow-up. These children should continue to receive blood lead tests every 3-4 months or more often if indicated. Children with blood lead levels greater than or equal to 45 µg/dL must receive urgent medical and environmental follow-up. It is recommended that this follow-up take place at a clinic experienced in dealing with lead poisoning. Symptomatic lead poisoning or a venous blood lead level of 70 µg/dL or greater is considered a medical emergency and requires immediate inpatient chelation therapy (CDC, 1991).

Improved Nutrition

Improved nutrition is essential in preventing childhood lead poisoning. It has been determined that high fat diets should be avoided among children with elevated blood lead levels. Fat binds to lead in the body, thus reducing the ability of the body to excrete the lead (Agency for Toxic Substances Disease Registry, 1990).

Environmental Case Management

Environmental case management should employ a team approach strategy. The team should consist of professionals in public health, environmental activities, medical management, educators, and social management. Educating parents about the sources, effects and prevention of lead poisoning is key. In addition, an investigation of the environment to identify lead sources, development, and evaluation of long-term interventions to reduce exposure are also vital to reduce exposure in children.

The CDC recommends that children with blood lead levels greater than 20 µg/dL have environmental interventions as soon as possible, and that children with blood lead levels exceeding 45 µg/dL receive chelation therapy. The CDC further recommends that in the latter case, children not be allowed to return to the home until the lead has been abated. Those children with blood lead levels greater than 70 µg/dL should be hospitalized immediately (CDC, 1991). In instances where blood lead levels are between 45 and 69 µg/dL, environmental investigation and intervention should start within five working days.

For those children with levels between 20 and 44 µg/dL, investigations should begin within ten working days. Blood lead levels between 15 and 19 µg/dL, at bare minimum, require familial lead education. When blood lead levels are continually 15µg/dL environmental interventions should take place (CDC, 1991).

Treatment of Lead-Poisoned Children

Numerous drugs are used in the treatment of lead poisoning. These drugs are called chelating agents and have the ability to bind lead, depleting the lead from soft and hard tissue. This results in the reduction of acute toxicity (Chisolm, 1968; Markowitz & Rosen, 1984).

Treatment of lead toxicity should go beyond medical care for specific tissue and organ effects and chelation of lead. For both asymptomatic excess exposure to lead as well as the symptomatic child, the sources of lead must be identified and controlled (Klaasen, Amdur & Doull, 1986).

Identification and control may take the form of a review of lifestyle including: diet (especially iron deficiency) type of dwelling; play habits; and an evaluation of those children who are suspected of eating paint chips. The treatment process may also involve social services, modification of dwelling and parent education.

Health Education and Type of Instruction

The literature on the effectiveness of video education as compared to personalized instruction is limited. However, a review of those studies that compared video instruction to other educational interventions is presented. Results of studies comparing different health education techniques yielded varying levels of effectiveness with regard to the type of instruction received. While video instruction has become more popular among health educators, studies evaluating the viewing of videos as an educational medium are few. Some of those studies that have been evaluated are presented.

Video instruction is often a consideration in health education programs for a number of reasons. These reasons include; (a) cost effectiveness; (b) assurance of a standard level of teaching; (c) assurance that each individual will receive the same information, and (d) the potential of reaching a larger audience. A final consideration in ascertaining the usefulness of video instruction in patient education is the high rate of illiteracy in the United States. Thus, video instruction may reach a more varied audience with differing abilities and learning styles.

Wicklin and Forster (1994), found that a more personal approach to health education teaching was more effective in decreasing anxiety levels in the sample of 91 hospital patients. The study utilized two different types of video instruction to reduce patients preoperative anxiety. The factual approach video (FAV) used in the study was a video wherein a nurse described basic same day surgery procedures that would occur before and after surgery. The personal approach video (PAV) was a type of modeling procedure. Rather than have the nurse present factual information regarding same day surgery procedures, the camera angle was that of the patient's eyes. The video focused on the patients' sensations and thoughts. Results of the study revealed that type of instruction was not a statistically significant predictor of lower anxiety level.

In assessing the effectiveness of videotape patient education, Stone, Holden, Knapic, and Ansel (1989) conducted a study on educating 22 patients on anticoagulation therapy. The researchers randomly assigned patients to receive either videotape or personalized teaching for oral anticoagulation therapy. In addition to seeking to determine the effectiveness of use of video instruction as a viable teaching tool, the study sought to examine patients' acceptance of video instruction. The video utilized in the study was a 15-minute program produced by the authors. The presentation given to the patients in the personal instruction group was standardized, containing information identical to that of the video. At posttest, both groups showed a significant increase in their knowledge about anticoagulation therapy. However, results from the study indicated that no significant differences existed between the the video group and the personal instruction group on posttest knowledge. The authors, do however, contend that although no differences were seen at posttest, videotape teaching is "an effective and well-accepted alternative form of patient education requiring significantly less personnel time."

Several studies have found that video instruction increases patients' short term knowledge (Cassileth, Heiberger, March, and Sutton-Smith, 1982; Cohen, 1983; Black and Mitchell, 1977; Ward, Garlant, Paterson, Bone and Hicks, 1984; and Lawson, Traylor and Gram, 1976). The study by Lawson, et al. (1976) went a step further by controlling for the education level of patients. The authors found that after renal patients viewed a video on proper diet, those patients with less education had posttest scores equal to those with more education.

Osguthorpe, Roper and Saunders, (1983) conducted a study among psychiatric patients which compared video instruction, video instruction plus written material, written material only, and usual patient education instruction. Overall, no statistically significant differences were seen between the four teaching interventions.

When health education programs are being evaluated for their effectiveness, attention should be given to the setting in which the educational intervention takes place. This is particularly true with video instruction. In fact, Kleemeier and Hazard found that the setting in which the video tape is viewed affects participants' ability to retain the information. The researchers used two groups to compare the effects of video instruction on short term memory. Videos on parenting tips were shown in pediatric waiting rooms. Subjects were randomly assigned to either view the video tape in the waiting room area of the clinic or to view the video in a structured setting in a separate room. The parents in the structured setting learned significantly more. The knowledge level increase among the waiting room group was virtually non-existent.

Moldofsky, Broder, Davies and Leznoff, (1979) utilized an educational videotape program for patients with asthma. The study consisted of 62 patients who had a mean duration of asthmatic illness of 17 years. The knowledge level of the video instruction group was assessed immediately after viewing the tape and compared with that of the control group who did not view the tape. At this initial assessment, the experimental group was shown to have significantly higher knowledge than the control group. Retention of knowledge was assessed at 16 months following participation in the experiment. Results of this assessment indicated that the experimental group's knowledge had decreased to that of the control group.

The effectiveness of video-based interventions has also been utilized in AIDS education. A study by O'Donnell, San Doval, Duran, and O'Donnell (1995) examined the effectiveness of a video patient education program on promoting condom use among patrons of a Sexually Transmitted Disease (STD) clinic. Subjects were randomly assigned to receive either no intervention, video viewing, or video viewing followed by participation in an interactive group session. There were 1,653 subjects in the sample.

Compared to the control group, participants who were assigned to the video viewing alone had significantly higher posttest knowledge scores about condoms and STDs, more positive attitudes about condom use, increased risk perceptions, greater self-efficacy, and higher rates of condom acquisition. Those participants who received both the video instruction and were participants in the group session had even higher posttest results than the control group.

A study by Basen-Enquist, et al., 1994) examined the effectiveness of strategies to examine tobacco prevention practices among school-aged children. Teachers were randomly assigned to receive one of two types of training interventions. One group of teachers was trained using a live workshop conducted by a trained facilitator. The other group was trained using a video-taped version of the live workshop. Seventy-eight teachers comprised the sample. Of those who went through the program, those teachers who received the live workshop were more likely to teach the tobacco prevention curriculum. The data further showed that teachers who received the live workshop were better able to implement the tobacco prevention programs.

Although video instruction has been found to be somewhat successful in increasing knowledge, it remains a fact that increased knowledge does not always imply compliance. Lawson, et. al., (1976).found that one month after viewing a video on diet and renal disease, patients stuck to their diets. Another study by Sutton and Eiser (1984) found that a fear-arousing video on smoking increased attempts to stop smoking after 3 months. The study consisted of 61 subjects. One group saw a video on smoking and the other group saw a video on "another health topic." At three months follow-up, the researchers found that the group who watched the smoking video made a significantly higher number of attempts to cease smoking.

Education/Health Behavior

In planning health education programs, many educators have found it useful to assess needs in terms of beliefs included in the Health Belief Model. An in-depth discussion of the Health Belief Model including its constructs, previous uses of the model, and its applicability for this study, follows.

Theoretical Framework

The Health Belief Model

The Health Belief Model relates psychological theories of decision making to a person's decision about health behaviors. Becker's (1974) Health Belief Model states that the chance of a person engaging in a particular preventive health action is a function of the individual's beliefs about (a) the susceptibility and seriousness of the health problem, and (b) the benefits and barriers associated with taking this health action. The model essentially states that perceptions about susceptibility to a condition, the perceived seriousness of the disease and perceptions of the availability of preventive behaviors are all related to the likelihood that an individual will engage in preventive health behavior. Five concepts of the Health Belief Model were used in the current study: perceived susceptibility, seriousness, benefits, barriers, and motivation.

Perceived susceptibility refers to the individual's feeling of subjective risk of contracting the health problem. Susceptibility can also be defined in terms of how an individual views the likelihood of experiencing a potentially harmful condition. In summary, this dimension can be described as one's subjective perception of the risk of contracting a condition or disease.

Seriousness refers to the individual's perception about the severity that the condition may have on his/her life. Perceived seriousness is concerned with how threatening the condition is to the individual. Feelings related to the seriousness of contracting an illness (or leaving it untreated) vary from individual to individual.

Benefits are the individual's beliefs in the positive outcome of engaging in a particular health action. Perceived barriers are the specific conditions that the individual sees as limiting treatment for the condition. In other words, the negative aspects of This dimension often times depends upon individual beliefs regarding the effectiveness of the various actions available to reduce the threat of disease. Thus, if an individual is sufficiently threatened, he or she is unlikely to accept the recommended health action unless it was perceived as feasible and effective.

In addition to the original four concepts of the Health Belief Model, motivation has been used as part of the model. Motivation refers to a general intention that results in behaviors to maintain or improve health. In this view, the combined levels of perceived susceptibility and severity provide the force to act, and the perception of benefits (less barriers) provide a preferred path of action.

In planning health education programs, many educators have found it useful to assess needs in terms of beliefs included in the Health Belief Model, which originally hypothesized that individuals generally will not seek preventive care or health screening unless they have some level of relevant health motivation and knowledge. This model also contends that individuals have to view themselves as potentially vulnerable, the condition as threatening, and intervention as efficient in order to seek preventive care. The Health Belief Model further estimates that individuals must see few difficulties in undertaking recommended action (Rosenstock, 1974). According to Janz and Becker (1984), a kind of "cost-benefit" analysis is thought to occur where the individual weighs the action's effectiveness against perceptions that it may be expensive, dangerous, and/or unpleasant.

As stated previously, preventive health behavior was a major focus of the original Health Belief Model (Rosenstock & Kirscht, 1979). Compliance with medical advice became a major area of study regarding sickness behavior in recent years. A parent's beliefs about the threat of illness and the value and costs of prescribed treatment were assumed to be factors in the level of compliance. The Health Belief Model has been applied to numerous health behaviors including utilization of well-baby clinics, immunizations, and injury prevention.

Becker, Maiman, Kirscht, Haefner, and Drachman (1977) found that both general and specific beliefs concerning vulnerability, severity, benefits and barriers on the part of the mother were related to subsequent weight loss in obese children.

A study by Becker, Drachman, and Kirscht (1974), demonstrated the applicability of the Health Belief Model as a predictor of how well mothers engaged in recommended behaviors relating to their child's health. These behaviors included giving medications and/or keeping appointments. Although their study introduced some health care system factors (e.g. whether or not the physician had previously treated the child), the major focus was on the mother's beliefs. These beliefs included whether or not the mother perceived her child to be susceptible to the current illness again in the future, whether or not the illness was serious, and whether the prescribed medicine was of benefit.

A number of studies (Foss, 1985; Greaves, Glik, Kronenfeld & Jackson, 1990; Peterson, Farmer, & Kashani, 1990) have found constructs of the Health Belief Model to be predictors of health behaviors, including parental injury-prevention behaviors. The Health Belief Model has been used in numerous other health areas to assess maternal beliefs.

Becker, Nathanson, Drachman, and Kirscht (1977) conducted a prospective study that examined the relationship between mother's health beliefs and their utilization of pediatric clinic services for their children. Four aspects of clinic utilization were examined: visits for well-child care, acute-illness visits, accident-related visits, and appointment keeping. The study found that those mothers who perceived their children to be in poor health and prone to illness were less likely to bring their child in for a well-baby visit and more likely to bring their children to the clinic for illness/accident visits. Conversely, mothers who were considered more active towards health care and considered their children to be in good health were more likely to use preventive services. This same group of mothers utilized the clinic for fewer illness/accident visits. The study also found that, depending upon the degree of maternal agreement with the doctor's diagnosis, strong predictions could be made regarding the utilization of clinic services.

A study by Rosenblum, Stone & Skipper (1981) utilized the Health Belief Model to examine compliance in immunization of preschoolers. A sample of 94 mothers of preschool children were included in the study. Each mother received a personal interview, after which the mothers were divided into two groups depending on their compliance or noncompliance with recommended immunization. The study showed that there was no significant difference between compliant and noncompliant mothers with respect to perceived susceptibility. Other variables in the model included race, age of mother, income level and education. Morris, Hatch and Chipman (1966) found that negative attitudes affect maternal utilization of well-baby clinics. Their study found that those mothers who obtained few immunizations for their infants were more likely to have a lower perceived benefits attitude about the usefulness and purpose of well-baby clinics.

Bertakis (1986) applied the Health Belief Model to patient education and compliance to acute otitis media. The study examined the effect of an educational intervention on sick-role behavior. The study included 59 mothers of children with otitis media with 29 mothers placed in the experimental group and 30 mothers in the control group. The questionnaire included 20 questions aimed at measuring maternal attitudes. Other variables in the model included age of parent, education level of parent, annual family income, and type of insurance. Following the administration of the pretest, those mothers in the experimental group received additional instruction on the treatment of acute otitis media. Those mothers in the control group received information and pamphlets on the importance of safety belts and children's car seats. The study revealed statistically significant differences in maternal health beliefs between the experimental and control groups. Among the experimental group, health beliefs changed significantly in the positive direction with respect to susceptibility and benefits. Attitudes among the control group did not change significantly. Although statistically significant differences were seen at posttest on health beliefs, compliance between the experimental and control groups did not differ significantly.

Kviz, Dawkins & Ervin (1985) focused on various social psychological factors that influence maternal health behavior. As such, the authors used the Health Belief Model to assess the use of well baby services among a poor, minority, high-risk population. In this study, an initial face-to-face interview was conducted during the women's last trimester of pregnancy. A second interview was conducted during the 1-month well-baby visit and the final interview took place at the 6-month well-baby clinic visit. The results showed that health beliefs at the first month had no predictive value with respect to the number of immunizations received. However, at 6 months, 30% of the variance in the number of immunizations received was accounted for. All the health beliefs combined explained 40% of the variance in the number of immunizations received. The highest single predictor of the number of immunizations received was the mothers' perception of the efficacy of immunizations at the sixth month. The perception of benefits at the first month was positively related to the number of immunizations. However, a negative relationship between perceived benefits and the number of immunizations was present at six months. Overall, maternal health beliefs about susceptibility to illness and clinic utilization had a negative relationship as well. The researchers believe that this relationship was caused by a decrease in some mother's perceptions of the benefits of using well-baby clinic services as the number of available health protection services increased. A previous study of low-income mothers had shown a positive relationship between use of clinic services and maternal concerns about their child's health, susceptibility to an illness, and confidence in the physician (Becker, et.al., 1977). Becker, Haefner, Kasl, Kirscht, Maiman & Rosenstock (1977) also found that, among low-income mothers, utilization of well-baby services was positively related to a mother's feelings about both the physician and her own role in the health intervention process.

A study by Thuen (1992) used the Health Belief Model as a theoretical framework to examine maternal practices in reducing household hazards. The parents of children between 6 and 18 months of age participated in the study. The purpose was to assess the extent to which parents act on reducing their children's exposure to household hazards. A questionnaire was sent to the parents of 793 children in four small urban municipalities in Norway. The researchers had approximately an 85% response rate. The results indicated that to a large extent, parents kept potentially dangerous objects out of their children's reach. Findings indicated a high level of perceived susceptibility and seriousness among parents with respect to household hazards. Barriers to installing safety devices were not common. Parents in the study perceived a high level of benefit to using safety devices. The study further indicated that parents with small children are aware of household hazards and take actions to limit hazards to their children.

Haefner and Kirscht (1970) attempted to increase individuals' readiness to practice preventive care by presenting them with communications about selected health problems. These messages were intended to increase both perceived susceptibility and/or severity regarding health problems and efficacy of professionally recommended behavior. The study found that, in the absence of symptoms, significantly more people exposed to such messages visited a physician for a checkup within the eight months following the campaign than those not exposed to such messages.

Another study (Becker, Kaback, Rosenstock & Ruth, 1975) utilized the Health Belief Model in genetic screening among a Jewish population. The disease under study was Tay-Sachs, a relatively rare disease found disproportionately among people of Jewish ancestry. The researchers inferred that participants had little contact with the disease or interventions such as screening or amniocentesis and held few relevant beliefs about the disease prior to the program. All adults who appeared for screening were asked to complete a questionnaire prior to screening; 500 of these were selected at random as sample participants. Another 500 questionnaires were mailed to a random sample of non-participants who had also been invited for screening. The results showed that the groups differed in health motivation: 82% of those who expressed an interest in having future children were participants in the screening program; fewer than 19% without this desire participated. Perceived susceptibility to being a carrier had a high correlation with screening program participation.

Other studies (Hovland, 1953; Janis & Feshback, 1953; Leventhal 1965) have suggested that, in the absence of symptoms, low levels of perceived severity are not sufficiently motivating, while high levels of perceived seriousness are inhibiting. Thus, being at either extreme implies a low likelihood of an individual's taking preventive health measures.

Additional studies (Cauffman, Petersen, & Emrich, 1967; Gabrielson, Levin & Ellison, 1967) reported that parents' estimates of severity of their child's condition is positively related to maternal compliance relative to obtaining follow-up care. Another study (Becker, Drachman & Krischt 1972) found that mothers who complied with follow-up appointments and prescribed regimes were more likely to own fever thermometers, give their child special foods and vitamins, and had higher expectations and desires for their children than non-compliant mothers.

According to some researchers (Francis, Korsch & Morris, 1969; Korsch, Gozzi & Francis, 1968), a mother's compliance with a prescribed regime is better when the mother is satisfied with the initial contact and has a perception of the physician as friendly and understanding. These studies also found that key indicators of non-compliance were seen when patient's expectations were not met.

The Health Belief Model is relevant to the current study in that evidence of the predictive value of health beliefs for compliance appears strongest when the beliefs of parents particularly mothers are examined in relation to a regimen prescribed for a child. This is particularly true where actions of the parent determine the behavior. Under the current study, the actions of the parent have a direct impact on the child's potential exposure to lead.

Based on the review of the literature, the need for the current study is substantiated. A number of recommendations have been made on what should be included in parental lead education programs. However, virtually no studies have been published that specifically address the effectiveness of these educational interventions.

A study by Kimbrough, LeVois and Webb (1994) conducted research on educating parents of lead-poisoned children and found parental education to be valuable in reducing the blood lead levels of their children. The intervention consisted of educating and counseling the parents of children with blood lead levels greater than 10 µg/dL. Parents of the lead poisoned children were counseled on the prevention of lead poisoning and factors that increase the risk of exposure. Parents were told how to reduce further exposure with regard to housekeeping practices and how to improve nutrition. Parents were also warned of the dangers of undertaking any renovations in their home without proper instruction. The educational intervention took place in the homes of the lead poisoned child, as did counseling after the results from the blood tests were received. The study included 490 children under six years of age. Four months later, the children were re-tested and were found to have significantly lower blood lead levels than at initial testing. Kimbrough, et al. suggest further studies on the effects of educating parents on reducing the likelihood of exposure.

In order to begin filling in some of the existing gaps between what is recommended by the CDC and how well these health education programs work in meeting the needs of those parents and children at risk, the current study is necessary. Although little existed in the way of health education programs specifically related to childhood lead poisoning, the investigator drew upon literature relative to health behavior and other diseases to formulate the hypotheses for the current study.

Hypotheses for the current study are:

Knowledge

1. There will be a significant increase in the posttest knowledge for the two groups.

1a. There will be a significant increase in posttest knowledge of the personal instruction group.

1b. There will be a significant increase in the posttest knowledge level of the video instruction group.

Health Beliefs

H2. There will be a significant change indicating greater concern for childhood lead poisoning in posttest health belief scores among participants in the maternal lead-poisoning education program as compared to pretest scores.

2a. There will be a statistically significant increase in perceived seriousness scores between pretest and posttest administration among participants who received personal instruction.

2b. There will be a statistically significant increase in perceived susceptibility scores between pretest and posttest administration among participants who received personal instruction.

2c. There will be a statistically significant increase in perceived benefit score between pretest and posttest administration among participants who received personal instruction.

2d. There will be a statistically significant decrease in perceived barriers score between pretest and posttest administration among participants who received personal instruction.

2e. There will be a statistically significant increase in perceived motivation score between pretest and posttest administration among participants who received personal instruction.

2f. There will be a statistically significant increase in perceived seriousness score between pretest and posttest administration among participants who received video instruction.

2g. There will be a statistically significant increase in perceived susceptibility score between pretest and posttest administration among participants who received video instruction.

2h. There will be a statistically significant increase in perceived benefit score between pretest and posttest administration among participants who received video instruction.

2i. There will be a statistically significant decrease in perceived barriers score between pretest and posttest administration among participants who received video instruction.

2j. There will be a statistically significant increase in perceived motivation score between pretest and posttest administration among participants who received video instruction.

Compliance

3. There will be a statistically significant increase in the posttest compliant behavior among participants in the maternal childhood lead-poisoning education program as compared to the pretest scores.

3a. There will be a statistically significant increase in the posttest compliant behavior among participants who received personal instruction as compared to the pretest compliant behavior.

3b. There will be a statistically significant increase in the posttest compliant behavior among participants who received video instruction as compared to the pretest compliant behavior.

Instructional Modality

4. There will be statistically significant differences in pretest and posttest changes with regard to type of instruction.

4a. Personal instruction will result in significantly higher posttest knowledge scores than video instruction.

4b. Personal instruction will result in significantly higher posttest health belief scores than video instruction.

4c. Personal instruction will result in significantly higher posttest perceived seriousness scores than video instruction.

4d. Personal instruction will result in significantly higher posttest perceived susceptibility scores than video instruction.

4e. Personal instruction will result in significantly higher posttest perceived benefit score than video instruction.

4f. Personal instruction will result in significantly lower posttest perceived barriers scores than video instruction.

4g. Personal instruction will result in significantly higher posttest perceived motivation scores than video instruction.

4h. Personal instruction will result in significantly higher posttest reported compliant behavior than video instruction.

Health Belief Model

H5. Posttest knowledge, perceived seriousness and susceptibility, and perceived benefits will be the highest predictors of compliant behavior.

CHAPTER 3

METHODS

Purpose

The purpose of this study is to determine the effects of two educational interventions on participant's knowledge, health beliefs and compliant behavior as related to childhood lead poisoning. In particular, the study seeks to determine if one intervention technique is more effective than the other. The study further seeks to examine the effects of knowledge and health beliefs on compliant behavior in both groups at posttest administration.

Study Design

The investigator used a randomized pretest posttest design. Subjects were systematically assigned to receive either video instruction or personal instruction from the investigator. This determination was made by the number designated on the participants' questionnaire. Those questionnaires were numbered one through fifty. The questionnaires were placed in numerical order and as each mother volunteered for the study, she received the next available questionnaire. Individuals with an even-numbered questionnaire received video instruction, and individuals with an odd-numbered questionnaire received personal instruction from the investigator. The pretest was administered on site by the investigator. The posttest was administered via a telephone interview one month after the pretest. For those individuals who did not have telephones (N=5), the investigator conducted a face-to-face interview in their homes. The study involved an initial assessment of the mother's knowledge, health beliefs, and compliance. Following the initial administration of the pretest, participants received the one of the educational interventions. There were 25 subjects in the video instruction group and 25 participants in the personal instruction group

Sample and Setting

Sixty-eight mothers who utilize Norfolk Department of Health's Women and Infant Children (WIC) clinic sites were asked to volunteer for the study. Of those, fifty (73%) agreed to participate. Mothers who refused to participate in the study cited lack of time as their main reason for nonparticipation. The criteria for inclusion in the study was having at least one child under six years of age. After having first been seen by the clinic nurse, mothers were asked if they were interested in participating in the study. Mothers who agreed to participate were then seen by the investigator.

Demographic data was obtained by questions on the Childhood Lead Poisoning Prevention Instrument that asked respondents to identify their race, age, highest level of education, total family income, and marital status. Gender was not included as a demographic variable since previous studies indicated that the mother is typically the person bringing children in for medical treatment. This held true in the pilot study; and thus gender was excluded from the present study as well. Additional information was sought on type of health insurance, number of children, age of youngest child, whether or not the child had a pediatrician, where child(ren) were taken for medical treatment, distance traveled to the clinic, and whether or not family lived in a dwelling built before 1978.

Demographic Variables

As Table 3-1 shows, 94% (N=47) of the sample was African American. The majority of subjects, 32% (N=16) were between 19 and 24 years of age. Approximately 30% (N=15) reported their ages as being between 25 and 34 years of age. Some 28% (N=14) of the respondents were over 35 years old. This variable originally included seven categories. For the purposes of the study was recoded into four categories. Recoding was performed to avoid categories with no response.

Education was defined as the number of years of education completed by the respondents. Most of the respondents, 36% (N=18) were high school graduates, followed by 32% (N=16) who reported having some college. Approximately 22% (N=11) of the respondents reported having less than a high school education.

Total family income was reported by income category. The data showed that the largest percentage of respondents 62% (N=31) had a total family income of less than $10,000 per year. As seen in Table 3-1, 28% (N=14) reported total family incomes of between $10,000 and $24,999. The remaining 10% (N=5) reported a total family income between $25,000 and $34,999. Although this variable was broken down into 5 categories ($35,0000-$44,999 and $45,000 +), study participants all fell into three categories. These three categories were recoded into two categories: less than $10,000 per year and greater than $10,000 per year.

For analysis purposes, this category was recoded as two categories, married and not married. Of the total sample, 82% (N=41) respondents were not married. The remaining 18% (N=9) were married.

Table 3-1

Sociodemographic Characteristics

N=50

Variable	Percentage Answering		
	Overall	Video	Personal
Race			
African American	94	88	100
Non-African American	6	12	0
Age			
< 18	8	8	8
19-24	34	40	28
25-34	30	28	32
35 +	28	24	32
Education			
< High School	30	24	36
High School Graduate	38	32	44
Some College	32	44	20
Total Family Income			
$<10,000K	64	60	68
$>10,000K	36	40	32
Marital Status			
Married	18	24	12
Not Married	82	76	88
Mean (s.d.)			
Number of Children	2.64 (1.601)	2.88 (1.878)	2.40 (1.258)
Age youngest child in months	24.62 (17.861)	24.48 (16.174)	24.76 (19.741)

Video and Personal refer to type of instruction received.

With regard to the number of children, 26% (N=13) reported having only one child. Some 28% (N=14) reported having two children. The remaining 46% (N=23) of the respondents had 3 or more children. The mean number of children was 2.64 (1.608). The age of the youngest child ranged from 1 to 72 months. The mean age of the youngest child was 24.62 (17.861) months.

Access to Medical Care Variables

As Table 3-2 shows, 14% (N=7) participants reported having no health insurance. Slightly less than half, 46% (N=23) of the participants were Medicaid recipients. The remaining 40% (N=20) had private health insurance. The instrument listed "HMO" as a separate level of the insurance variable and it is noted that there is a Medicaid HMO. Therefore, it is possible that some of the Medicaid recipients checked the HMO response as opposed to Medicaid. Although the instrument originally sought information on several different types of health insurance, this variable had to be recoded due to nonresponses in this category.

Seventy six percent of participants' children had their own pediatrician and 60% reported that they go to a private physician for medical care. Fifty percent of participants were living between 1 and 5 miles from their local health department and 26% live less than 1 mile from the clinic. The remaining 24% lived 6 or more miles from the clinic.

Lead Poisoning Risk Factor Variables

As seen in Table 3-3, more than half, 58% (N=29) of the participants reported living in housing constructed prior to 1978; 10% reported not living in pre-1978 housing

Table 3-2

Access to Medical Care Variables

N = 50

Variable	Percentage Answering		
	Overall	Video	Personal
Do you have health insurance?			
Yes	86	80	92
No	14	20	8
Type of Insurance			
None	14	20	8
Private Insurance	40	48	44
Medicaid	46	32	48
Does your child have a pediatrician?			
Yes	76	76	76
No	24	24	24
Where do you take your child for medical treatment?			
Private Physician	60	60	60
Other	40	40	40
Distance traveled to clinic			
< 1 mile	26	32	20
1-5 miles	50	44	56
6 or more miles	24	24	24

Table 3-3

Summary of Risk Factors for Lead Poisoning Investigated in the Current Study

N = 50

Variable	Percentage Answering		
	Overall	Video	Personal
Was your home built before 1978?			
Yes	58	64	52
No	10	8	12
Don't Know	32	28	36
Has your child been previously treated for lead poisoning?			
Yes	26	24	28
No	74	76	72

and the remaining 32% did not know whether or not they were living in or had previously lived in housing that was built before 1978. Further, 26% of the participants in the study reported that their child(ren) had been previously treated for lead poisoning.

Human Subjects

The investigator obtained approval from the Old Dominion University Human Subjects Review committee as well as the director of the Norfolk Department of Health. All participants were volunteers and were required to sign a written consent form. Human Subjects guidelines were adhered to in that participants were made aware that the information collected from them would be kept confidential and that their refusal to participate in the study would in no way affect their medical care.

Instrument

The instrument used in this research was a modified version of the Childhood Injury Prevention Instrument (Russell, 1991). Russell's instrument was developed to assess maternal health beliefs as they related to preventing injuries in children. It utilized constructs of the Health Belief Model. Reliability measures from Russell's study produced Cronbach Alphas ranging from .83 to .98, indicating that the instrument has good internal consistency in its measurement of the Health Belief Model constructs.

Russell (1991) contended that education-based interventions to increase parents' knowledge about childhood injury did not go far enough in reducing injuries in children. Russell obtained results from a group of 50 randomly selected mothers with children ages one through three years of age living in public housing. This particular population was chosen because young children from low-income families have higher death rates of home related injury and higher rates of repeated incidents of injury in their homes. The majority of the sample was African American (96%). Eighty percent were single parents and were between 17 and 36 years of age. Seventy-one percent of the mothers in the sample had not completed high school. The sociodemographic profile of the subjects utilized in the development of the Childhood Injury Prevention Instrument is similar to that of those participating in the current study.

Like Russell's instrument, the current instrument consisted of five scales: seriousness, susceptibility, benefits, barriers, and motivation. A five-point Likert scale ranging from strongly disagree to strongly agree was used in the construction of each of the scales. For the purposes of the current study, the instrument was modified because some of the responses were not applicable to the current study. In order to check the subscales for internal consistency, a reliability analysis was conducted using the pretest responses to each of the five subscales of the Health Belief Model using the Cronbach Alpha. Results from this analysis appears in Table 3-4. The reliability coefficients are as follows: seriousness .65, susceptibility .84 (after the deletion of item 15d), .78, perceived benefits .81, perceived barriers .73, and perceived motivation .76.

Table 3-4

Cronbach Alpha Coefficients for Subscales of the Health Belief Model at Pretest

N = 50

Subscale	Alpha Coefficient
Seriousness	.6572
Susceptibility (after deletion of #15d)	.7846
Benefits	.8110
Barriers	.7365
Motivation	.7687

Each of the five subscales were considered reliable. Champion (1984) and Bates (1994) have stated that Cronbach Alpha coefficients of .60 or higher can be considered reliable. It should be noted that the reliability scores for the current instrument were lower than those of the original instrument. These differences are attributed to the fact that the current instrument had fewer items on each subscale than the original instrument.

Operational Definitions

Knowledge

Knowledge refers to each participant's awareness and understanding of the health hazards of childhood lead-poisoning. The knowledge variable consisted of a series of 10 true/false statements about childhood lead poisoning. Each response was worth 1 point. Knowledge was measured by summing Q13a-Q13j (Q=question). The minimum score was 0 points and the maximum score was 10 points. The higher the score, the more knowledgeable the respondent about the dangers of childhood lead poisoning.

Questions that assessed the participant's knowledge about the dangers of lead were developed by the investigator utilizing information as outlined by the Centers for Disease Control, the National Safety Council, and information contained in the video used in the project. The information from the three sources was consistent and was considered essential in a maternal lead education program

Compliance

In measuring the compliant behavior variable, respondents were asked to answer "yes" or "no" to three questions relative to practices that have been shown to have a positive impact on reduced exposure to lead. These practices include dusting using a damp cloth with detergent, washing their children's hands before meals and washing their children's toys before the children played with them. Compliant behavior was measured by adding Q19, Q21 and Q22. Compliant behavior questions were in a "yes/no" format. Each "yes" answer was assigned a value of 1 and each "no" response was assigned a value of 0. The minimum score for this variable was 0 points and the maximum score was 3 points. A score of 3 points for this variable was considered "compliant." Any score less than 3 was considered "non-compliant."

Health Beliefs (Attitudes)

A 29-item, five point Likert Scale format was used to measure each subscale of the Health Belief Model. These subscales are seriousness, susceptibility, benefits, barriers and motivation. Respondents were asked to indicate the level of agreement or disagreement with each statement. For example, 1=strongly disagree, 2=disagree, 3=undecided, 4=agree and 5=strongly agree. Each response was scored with positive responses being given a higher score.

Seriousness

The seriousness scale was composed of six items which were refined to measure maternal perceptions of the seriousness of childhood lead poisoning. This subscale refers to the individual's perception about the severity that lead poisoning has on her child. The items contained within the seriousness scales are Q14a-14f and are scored by adding Q14a-Q14f. The statements in this section sought to determine how serious mothers perceived childhood lead poisoning to be. The minimum score was 6 points and the maximum score is 30 points. The higher the score for this variable, the more serious lead poisoning was perceived to be.

Susceptibility

The susceptibility scale consisted of six items which sought to measure the mother's beliefs about the likelihood that their children would become lead poisoned. Susceptibility refers to the individual's subjective feelings of the risk of their children becoming lead poisoned. The statements in this section sought to determine to what degree mother's felt their children were likely to realize lead poisoning in the future. Susceptibility was measured by Q15a-15f. It was scored by summing Q15a-Q15f. The minimum score was 6 points and the maximum score was 30 points. For this variable, the higher the score, the greater was a mother's perception of the susceptibility of her child to lead poisoning.

Benefits

The benefits scale was a five-item scale that examined maternal feelings about the benefits of having her child tested for lead poisoning. Benefits refer to individual's beliefs in the positive outcome of engaging in a particular health action to reduce negative aspects of childhood lead poisoning. The benefits item was measured by Q16a-!6e. It was scored by summing Q16a-Q16e. The minimum score was 5 points and the maximum score was 25 points. For this variable, as the score increased, so did the mother's perceptions about the benefits of taking steps to improve her children's health.

Barriers

The barriers scale consisted of six items aimed at determining mothers' perceptions about barriers they may face in having their child tested for lead poisoning. Barriers refer to those negative aspects associated with childhood lead poisoning. Barriers were measured by Q17a-Q17f. This item was scored by adding Q17a-Q17f. The minimum score was 6 points and the maximum score was 30 points. As the barriers score increases, so does the mother's perceptions about existing deterrents in accessing adequate health care for her child.

Motivation

The motivation scale was also a six item scale that sought to determine the level of motivation felt by the mothers with respect to childhood lead poisoning. Motivation refers to the general intention that results in behaviors that would maintain or improve the participant's child's health. Motivation was measured by Q18a-Q18f. It was scored by adding Q18a-Q18f. The minimum score was 6 points and the maximum score was 30 points. The higher the score, the more motivated participants were likely to be in taking the necessary precautions to prevent lead poisoning in their children.

Additional variables on the instrument included age of parent, race, educational level of parent, total family income, and type of insurance. These variables were selected based on previous research (Bertakis, 1986; Rosenblum, 1981; Lochhead, 1991; and Becker, 1977).

Pilot Study

The investigator conducted a pilot test on a small sample (N=5). The purpose of the pilot study was to determine the amount of time required to complete the questionnaire and to receive instruction. Time consideration was of major importance in the study; the mothers had other appointments within the clinic and often had other appointments after leaving the clinic. Time was also of concern in that the investigator had to work around the clinic's overall operating schedule. Participants in the study had to see other health care providers within the clinic as well as the investigator. These included a visit with the nurse and the nutritionist. Thus, time constraints were of major concern.

The pilot study revealed that, in the interest of time, it would be more efficient for the investigator to administer the questionnaire to each of the participants rather than have the mother fill out the questionnaire. The pilot study pointed to the fact that it was difficult for the mother to try to manage her child and complete the questionnaire at the same time. Administration of the questionnaire by the investigator seemed to create a more systematic flow for the clinic and the participants as well. It reduced the amount of time each participant had to spend with the investigator. No modifications were required for the instrument.

Procedure

Session One

In the first session, mothers met with the investigator and signed the consent form. The consent form explained the purpose of the study, emphasized that participation was strictly voluntary, and ensured confidentiality. At this time, the participants were administered the pretest in a structured interview format. Data was collected on demographics, approximate date of construction of dwelling (pre or post 1978), and a series of questions that assessed the participant's overall knowledge of the health hazards of lead. (See Appendix B). Pretest interviews were conducted on a one-on-one basis by the investigator. A face to face session with each mother was performed by the investigator.

Following the administration of the pretest, the participant either watched a 12-minute video or was instructed by the investigator about childhood lead poisoning. The method of instruction depended upon the assigned number on the pretest questionnaire. The video utilized in the project was developed by the American Academy of Pediatrics and the personal instruction information was identical to the information in the video. The script utilized in the personal instruction method can be seen in Appendix D.

Session Two

Following the pretest and instruction, the investigator contacted participants by telephone to administer the posttest. The posttest was administered approximately one month after the pretest. Based on recommendations of staff members at the local health departments, it was recommended that the posttest interview be conducted as soon as possible following the pretest as attrition could potentially become a problem. For those participants who did not have telephones (N=5), the investigator conducted the posttest interview face-to-face in their homes.

A Mann-Whitney U-Test and a χ^2 test was run on the instrument variables to examine the extent to which the groups were equal at pretest. This analysis included the socioeconomic status (SES) variables, access to medical care variables, the risk factors to lead poisoning variables as well as knowledge, health beliefs and compliance. These comparisons are presented in Tables 3-5 thru 3-10.

The data show that at pretest, no statistically significant differences existed between the personal instruction group and the video instruction group with regard to age, income, education, marital status, age of youngest child and the number of children. It should be noted that race was not included in the analysis of the sociodemographic variables because there was not enough of a racial mix within the study population. Table 3-7 shows that with regard to where medical treatment was received, distance traveled to the clinic, the presence and type of health insurance, and having a pediatrician, there was no statistically significant difference between the video group and the personal instruction group.

Further, the investigator sought to determine if the two groups differed on the risk factors associated with lead poisoning. The data again showed that no statistically significant differences existed between the groups on previous lead exposure and whether or not participants were living in homes constructed before 1978. Finally, with regard to compliant behavior, no statistically significant differences were seen between the personal instruction group and the video instruction group on overall compliance. There were no statistically significant differences on individual items relative to compliance.

Data Analysis

Several statistical tests were utilized in analyzing the data from this research. Both descriptive and inferential statistics were used in the data analysis. Frequencies and measures of central tendency were used to describe the sociodemographic variables, access to medical care variables, and lead poisoning risk factors. Individual item responses at pretest and posttest are presented in Appendix E. These responses included individual items on the knowledge, health belief and compliance

Table 3-5

Comparison of Socio-Demographic Variables by Type of Intervention Received

N=50

Variable	Video %	Personal %	p-value
Income			
% < 10K	68	60	
% > 10K	32	40	.55
Age			
<= 18	8	8	
19-24	40	28	
25-34	28	32	
35+	24	32	.82
Education			
< High School	24	36	
High School Grad.	32	44	
Some College	44	20	.18
Marital Status (% Not Married)	76	88	.26

** p < .05 * p < .10

Table 3-6

Comparison of Number of Children and Age of Youngest Child by Type of Instruction Received

N=50

Variable	Video Grp. Mean (sd)	Personal Grp.Mean (sd)	p-value
Age of youngest Child (in months)	24.48 (16.74)	24.76 (19.47)	.79
Number of Children	2.88 (1.87)	2.40 (1.25)	.68

** p < .05 * p < .10

Table 3-7

Comparison of Access to Medical Care Variables by Type of Intervention Received

N=50

Variable	Video %	Personal %	p-value
Where Medical Treatment Received			
Private Physician	60	60	
Emergency Room	4	8	
Health Department	24	8	
Other	12	24	.34
Clinic Distance			
< 1 mile	32	20	
1-5 miles	44	56	
6 or more miles	24	24	.59
Insured (%yes)	80	92	.22
Type of Insurance			
No Insurance	20	8	
Medicaid	48	44	
Private Insurance	32	48	.34
Pediatrician (% yes)	76	76	1.0

** $p < .05$ * $p < .10$

Table 3-8

Comparison of Risk Factor Variables to Lead Poisoning

N=50

Variable	% Yes	% Yes	Significance
Live in Pre 1978 housing	64	52	.68
Previous Lead Exposure	24	28	.74

** $p < .05$ * $p < .10$

Table 3-9

Comparison of Pretest Knowledge and Health Belief Scores by Type of Instruction Received

N = 50

Variable	Video Mean (sd)	Personal Mean (sd)	p-value
Knowledge	8.56 (1.71)	8.08 (1.32)	.08*
Seriousness	23.80 (3.12)	22.52 (4.28)	.33
Susceptibility	17.88 (4.57)	15.32 (4.93)	.09*
Benefits	21.68 (2.91)	21.88 (3.98)	.44
Barriers	12.72 (4.17)	11.40 (4.47)	.31
Motivation	24.24 (3.71)	24.96 (4.51)	.18

** $p < .05$ * $p < .10$

Table 3-10

Comparison of Pretest Scores of Compliant Behavior by Type of Instruction

N = 50

Variable	Video %	Personal %	p-value
Dusting	56	56	1.00
Wash toys	100	96	.31
Wash hands	36	44	.56
Compliant	20	24	.73

** $p < .05$ * $p < .10$

variables. In addition, frequency responses are presented for the entire sample as well as for each intervention group (Appendix E).

In analyzing the data for the study, initial analyses were performed to determine whether or not the distribution of the dependent variables followed a normal distribution. This determination is important in deciding whether to use parametric or nonparametric statistical tests. The distribution analysis showed that the data did not follow a normal distribution; therefore, non-parametric statistical tests were used. However, an ANCOVA was used to determine statistically significant pretest and posttest differences in knowledge and health beliefs while controlling for the pretest scores on these variables.

Additionally, a Spearman Rho correlation analysis was conducted to determine multicollinearity, the degree to which each of the Health Belief Model variables related to each other and to knowledge.

Finally, a logistic regression analysis was conducted to determine the extent to which each of the variables (knowledge, perceived seriousness, perceived susceptibility, benefits, barriers, and motivation) predicted compliance. The researcher determined logistic regression to be more advantageous than using a discriminant function analysis in that logistic regression produces odds ratios. An odds ratio is defined as the "probability of occurrence over the probability of non-occurrence" (Munro and Hazard, 1993, p. 233). Odds ratios are useful in determining how well a unit increase in the predictor variables predict the criterion or dependent variables.

For the current study, adjusted odds ratios helped the investigator determine to what degree an increase in knowledge and/or health beliefs increased or decreased the odds of compliant behavior.

For the purpose of constructing the multivariate model, the following definitions were utilized:

Knowledge

The knowledge variable was recoded into two categories: low and high. A high level of knowledge indicates a total knowledge score of 9 or more points.

Seriousness

The seriousness variable was recoded into two categories: very serious and not very serious. The highest possible score for this variable was 30 points. Very serious was defined as having a total score of 25 or higher points. Less than 24 points was considered not very serious.

Susceptibility

Perceived susceptibility was also recoded into two distinct categories: high susceptibility and low susceptibility. High susceptibility was defined as having a total score of 25 or higher. Low susceptibility was defined as having a susceptibility score of less than or equal to 24. The highest score for this variable was 30 points.

Benefits

The benefits variable was dichotomized into these categories: very beneficial and not very beneficial. The highest possible score for this variable was 25 points. A score of less than or equal to 22 was considered not beneficial and a score of 23 or higher was considered very beneficial. Thus, highly beneficial was defined as having a score of 23 points or higher.

Barriers

This variable was negatively worded. As such, a low score for this variable was considered more desirable. In other words, the lower the score, the fewer perceived barriers existed. The highest score for this variable was 30 points. This variable was recoded into two categories: few barriers and many barriers. A score of less than or equal to 12 was considered to indicate fewer perceived barriers. A total of 13 or more points indicated the perception of many barriers. Thus, perceived barriers was defined as having a total score of 12 or fewer points.

Motivation

The motivation variable was recoded into not motivated and highly motivated. The highest possible score for this variable was 30 points. A score of 25 or fewer points was considered not motivated. A score of 26 or higher was considered highly motivated. As such, motivation was defined as having a total score of 26 or higher points.

Compliance

The compliance variable combined three responses to questions about dusting techniques, hand washing practices, and toy washing practices. Each question followed a yes/no format. Each yes response was assigned a value of 1 point and each no response received a value of 0. The highest possible score for this variable was 3 points. As such, the scores were summed and all scores of 3 were considered compliant. Any score less than 3 was considered non-compliant (compliant = 1, non compliant = 0)

In building the multivariate model, several steps were employed. Initially, a χ^2 analysis were performed. For use within the χ^2 analysis, the above recoded knowledge and Health Belief Model subscales were cross tabulated with the compliance variable. In addition, cross tabs were computed on each of the recoded sociodemographic variables and compliance. Cross tabulations were computed for pretest and posttest scores. Following these analyses, a Mann-Whitney U-Test was computed on knowledge, Health Belief Model subscales, and the sociodemographic variables. It should be noted that with the use of the Mann-Whitney U-Test, the recoded version of the variables will not be used. Rather, the spread-out version of these variables were used. These tests were useful in determining the bivariate relationships between the independent variables and the dependent variable. It should also be noted that only those variables with p-values of .25 or less by the Pearson Chi-Square test were utilized in the multivariate model. As the use of logistic regression analysis requires 20 to 30 cases per independent variable, a maximum of three independent variables were utilized in constructing the multivariate models in the current study.

Hypothesis 1 In order to test the hypothesis examining increases in pretest and posttest knowledge about childhood lead poisoning, a Wilcoxon Matched Pairs test was computed. This analysis was conducted overall and in each of the groups. This analysis determined the significance level of changes in pretest and posttest knowledge levels among participants in the study.

Hypothesis 2 This hypothesis sought to determine if pretest and posttest health belief scores differed among participants. The analysis to be used to test this hypothesis was the Wilcoxon Matched Pairs test. This test was performed for all participants, pretest and posttest as well as a separate tests on each group. The purpose of this analysis was to determine whether the groups significantly changed their beliefs about childhood lead poisoning between pretest and posttest administration.

Hypothesis 3 Examination of pretest and posttest compliant behavior scores was the essence of this hypothesis. In order to examine differences in pretest and posttest compliant behavior, a McNemar χ^2 was performed. This test was designed to find out if statistically significant differences existed between pretest and posttest on participants' reported compliant behavior. In addition to examining the overall groups, a separate analysis was performed on each group.

Hypothesis 4 This hypothesis sought to determine if differences exist between groups on knowledge, health beliefs, and compliance with regard to type of instruction. In order to test this hypothesis, an Analysis of Covariance (ANCOVA) was utilized. The ANCOVA analysis examined posttest scores, utilizing the pretest score as a covariate and the type of instruction as a factor. Results from this analysis helped the investigator to ascertain whether or not differences exist with regard to the type of instruction received.

Hypothesis 5 This hypothesis sought to determine if any of the subscales of the Health Belief Model and knowledge were predictors of compliant behavior. In order to test this hypothesis, the multivariate logistic regression was used.

CHAPTER 4

RESULTS

Of the 5 major hypothesis (23 subhypotheses) formulated for this study, two were supported. Table 4-1 is a summary of the hypotheses for the convenience of the reader. Mean pretest and posttest knowledge and health belief scores are presented in Table 4-2.

Hypothesis 1

The data supported **hypothesis 1** which stated: *There will be a significant increase in the posttest knowledge for the two groups.* The data also supported hypothesis 1a and hypothesis 1b in that the posttest **knowledge** scores of both the personal instruction group and the video instruction group showed statistically significant increases at $p < .05$.

Hypothesis 2

Hypothesis 2 which stated: *There will be a significant change indicating greater concern for childhood lead poisoning in posttest health beliefs among participants in the maternal lead-poisoning education program as compared to pretest score* was partially supported.

Personal Instruction

Perceived seriousness was not statistically significantly higher at $p < .05$ at posttest among personal instruction participants. The data did not support hypothesis 2a in that there was no statistically significant increase in posttest **perceived seriousness** among participants receiving personal instruction. The data somewhat supported hypothesis 2b in that within

Table 4-1

Study Hypotheses in Table Form

	Hypotheses	Results
Knowledge	1. There will be a significant increase in the posttest knowledge for the two groups.	Supported
	1a. There will be a significant increase in posttest knowledge of the personal instruction group.	Supported
	1b. There will be a significant increase in posttest knowledge of the video instruction group.	Supported
Health Beliefs	2. There will be a significant change indicating greater concern for childhood lead poisoning in posttest health beliefs among participants in the maternal lead-poisoning education program as compared to pretest scores.	Not Supported
	2a. There will be a statistically significant increase in perceived seriousness score between pretest and posttest administration among participants who received personal instruction.	Not Supported
	2b. There will be a statistically significant increase in perceived susceptibility scores between pretest and posttest administration among participants who received personal instruction.	Supported
	2c. There will be a statistically significant increase in perceived benefit score between pretest and posttest administration among participants who received personal instruction.	Not Supported
	2d. There will be a statistically significant decrease in perceived barriers score between pretest and posttest administration among participants who received personal instruction.	Not Supported
	2e. There will be a statistically significant increase in perceived motivation score between pretest and posttest administration among participants who received personal instruction.	Not Supported

Table 4-1 (Continued)

Study Hypotheses in Table Form

	Hypotheses	Results
Health Beliefs	**2f.** There will be a statistically significant increase in perceived seriousness score between pretest and posttest administration among participants who received video instruction.	Supported
	2g. There will be a statistically significant increase in perceived susceptibility scores between pretest and posttest administration among participants who received video instruction.	Not Supported
	2h. There will be a statistically significant increase in perceived benefit score between pretest and posttest administration among participants who received video instruction.	Not Supported
	2i. There will be a statistically significant decrease in perceived barriers score between pretest and posttest administration among participants who received video instruction.	Not Supported
	2j. There will be a statistically significant increase in perceived motivation score between pretest and posttest administration among participants who received video instruction.	Not Supported

Table 4-1 (Continued)

Study Hypotheses in Table Form

	Hypotheses	Results
Compliance	3. There will be a statistically significant increase in the posttest compliant behavior among participants in the maternal childhood lead-poisoning education program as compared to the pretest scores.	Supported
	3a. There will be a statistically significant increase in the posttest compliant behavior among participants who received personal instruction as compared to the pretest compliant behavior.	Supported
	3b. There will be a statistically significant increase in posttest compliant behavior among participants who received video instruction as compared to the pretest compliant behavior.	Supported
Instructional Modality	4. There will be statistically significant differences in pretest and posttest changes with regard to type of instruction.	Not Supported
	4a. Personal instruction will result in significantly higher posttest knowledge scores than video instruction.	Not Supported
	4b. Personal instruction will result in significantly lower posttest health beliefs than video instruction.	Not Supported
	4c. Personal instruction will result in significantly higher posttest perceived seriousness scores than video instruction.	Not supported
	4d. Personal instruction will result in a significantly higher posttest perceived susceptibility scores than video instruction.	Not Supported

Table 4-1 (Continued)

Study Hypotheses in Table Form

	Hypotheses	Results
Instructional Modality	**4e.** Personal instruction will result in significantly higher posttest perceived benefit scores than video instruction.	Not Supported
	4f. Personal instruction will result in significantly lower perceived barriers scores than video instruction.	Not Supported
	4g. Personal instruction will result in significantly higher perceived motivation scores than video instruction.	Not Supported
	4h. Personal instruction will result in statistically higher posttest compliant behavior scores than video instruction.	Not Supported
Multivariate Hypothesis	**5.** At posttest, knowledge, perceived seriousness, and perceived susceptibility will be the highest predictors of compliant behavior.	Not Supported

Table 4-2

Pretest and Posttest Mean Score Changes in Knowledge and Health Beliefs Within Personal and Video Instruction Group

N = 50

	Video			Personal			Total		
Variable	Pre	Post	p-value	Pre	Post	p-value	Pre	Post	p-value
Knowledge	8.56	9.72	.00**	8.08	9.44	.00**	8.32	9.58	.00**
Seriousness	23.8	24.64	.06*	22.52	23.20	.12	23.16	23.92	.02**
Susceptibility	17.88	17.84	.58	15.32	16.68	.07*	16.60	17.26	.31
Benefits	21.68	22.32	.19	21.88	22.84	.35	21.78	22.58	.11
Barriers	12.72	13.40	.09*	11.40	13.4	.00**	12.06	13.4	.00**
Motivation	24.24	24.96	.25	24.96	25.72	.41	24.6	25.34	.14

** $p < .05$ * $p < .10$

the personal instruction group, there was no significant increase in posttest **perceived susceptibility**. The data did not support hypothesis 2c in that there was no statistically significant increase in **perceived benefits** among participants who received personal instruction. The data did not support hypothesis 2d in that there was a statistically significant increase in pretest and posttest **perceived barriers** within the personal instruction group. Although this difference was statistically significant, it was in the opposite direction than the direction hypothesized. It was hypothesized that there would be a significant decrease in **perceived barriers** at posttest. The data did however, support hypothesis 2e in that there was a statistically significant increase in posttest **perceived motivation** scores among those participants who received personal instruction.

Video Instruction

The data did not support **hypothesis** 2f in that there was no significant increase in **perceived seriousness** between pretest and posttest among those participants who received video instruction. The data did not support hypothesis 2g in that within the video instruction group, no statistically significant increase was seen on posttest scores on **perceived susceptibility**. The data did not support hypotheses 2h in that there was no statistically significant increase in **perceived benefits** between pretest and posttest administration within the video group. The data did not support hypothesis 2i in that there was no statistically significant decrease in posttest **perceived barriers** among participants who received video instruction. The data showed no significant increase at posttest in perceived barriers. The data did not support hypothesis 2j in that there was no statistically significant increase in posttest **motivation** score within the video instruction group.

Hypothesis 3

The data supported **hypothesis 3** which stated: *There will be a statistically significant increase in the posttest compliant behavior among participants in the maternal childhood lead-poisoning education program as compared to the pretest scores.* These data are presented in Table 4-3. The data supported hypothesis 3a and 3b in that the posttest **compliant behavior** score of both the personal instruction group and the video instruction group showed a statistically significant increase at $p < .05$.

Results showed that within the personal instruction group, statistically significant differences existed between pretest and posttest on two of the three recommended compliant behavior practices at $p < .05$. These two practices were dusting with damp cloth and detergent and washing children's hands before eating and after playing. These pretest and posttest differences were significant at $p < .05$. However, practices regarding the washing of their child's toys did not change between pretest and posttest. It should be noted that at pretest, 96% of this group reported that washing their child's toys before they play with them is routinely practiced. At posttest, 100% of this group reported washing their child's toys at posttest.

Table 4-3

Pretest and Posttest Compliant Behavior

N = 50

	Video Instruction			Personal Instruction			Total		
Variable (% yes)	Pretest %	Posttest %	p-value	Pretest %	Posttest %	p-value	Pretest %	Posttest %	p-value
Dust with damp cloth & detergent	56	92	.01**	56	96	.00**	56	94	.00**
Wash toys	100	100	1.00	96	100	1.00	98	100	1.00
Wash hands	36	88	.00**	44	80	.01**	40	84	.00**
Compliant	20	88	.00**	24	80	.00**	22	84	.00**

Compliant is defined as answering "yes" to all three.

** $p < .05$ * $p < .10$

For the video group, with regard to the practice of washing toys before their child played with them, no significant differences were seen between pretest and posttest as 100% of this group reported routinely washing their child's toys before they play with them at pretest and posttest. Overall, both groups significantly increased their compliant behavior from pretest to posttest.

Hypothesis 4

Knowledge

The data did not support **hypothesis 4** which stated: *There will be statistically significant differences in pretest and posttest changes with regard to type of instruction.* There were no statistically significant differences in pretest and posttest scores with regard to type of instruction. Two statistical methods were utilized in analyzing this hypothesis, a Mann-Whitney U-Test and an ANCOVA. These results are presented in Tables 4-4 and 4-5, respectively.

The data did not support hypothesis 4a in that differences were not statistically significant between pretest and posttest **knowledge** scores between the personal instruction and the video instruction group when the pretest scores were used as covariates. It is noted that there were statistically significant differences in pretest and posttest knowledge within both the video group and the personal instruction group. However, when type of instruction received was controlled for, these differences were not statistically significant.

Overall, differences between the video group and the personal instruction group were not statistically significant at $p < .05$ on knowledge. Differences were, however significant at $p < .10$. It should be noted, that the video group had a slightly higher mean knowledge score than the personal instruction group. The mean knowledge score for the video group was 8.56 (s.d. 1.71) and the mean knowledge score for the personal instruction group was 8.08 (s.d. 1.50).

There were individual questions where responses were significantly different between groups. For example, on question Q13d, which stated that damp mopping floors and windows reduces lead exposure, 72% of the personal instruction group answered this question correctly while only 56% of the video group answered this correctly. Among the personal instruction group, 80% answered this item correctly and 96% of the video instruction group answered this correctly.

The data did not support hypothesis 4b in that there was no statistically significant differences in pretest and posttest **health beliefs** with regard to type of instruction.

Presentation of analyses of the Health Belief Model subscales follow and are presented separately.

Seriousness

The data did not support hypothesis 4c in that no statistically significant differences were seen between pretest and posttest **perceived seriousness** with regard to type of instruction received. Results from the Mann-Whitney U-Test indicated that for the seriousness subscale, statistically significant differences were seen at $p < .10$ on Q14f which stated that problems from lead poisoning could last a long time. The ANCOVA

Table 4-4

Mean Posttest Knowledge Scores and Health Beliefs by Type of Instruction

N = 50

Variable	Video Group Mean	Personal Inst. Mean	p-value
Knowledge	9.72 (.67)	9.44 (.76)	.07*
Seriousness	24.64 (2.84)	23.20 (3.40)	.09*
Susceptibility	17.84 (5.43)	16.68 (5.38)	.47
Benefits	22.32 (2.44)	22.84 (2.44)	.42
Barriers	13.4 (4.49)	13.40 (5.15)	.86
Motivation	24.96 (12.95)	25.72 (3.14)	.21

** $p < .05$ * $p < .10$

Table 4-5

Summary of Computed F-Statistics From Analysis of Covariance With Pretest Scores as Covariates

N = 50

	Video	Personal	F-Statistic	p-value
Covariate Pretest Knowledge Main Effects Intervention	9.72 (.67)	9.44 (.76)	.78	.38
Covariate Pretest Seriousness Main Effect Intervention	24.64 (2.84)	23.20 (3.40)	1.25	.29
Covariate Pretest Susceptibility Main Effect Intervention	17.84 (5.43)	16.68 (5.38)	1.16	.28
Covariate Pretest Benefits Main Effect Intervention	22.32 (2.44)	22.84 (2.44)	.53	.46
Covariate Pretest Barriers Main Effect Intervention	13.40 (4.49)	13.40 (5.15)	3.39	1.00
Covariate Pretest Motivation Main Effect Intervention	24.96 (2.95)	25.72 (3.14)	.39	.53

** $p < .05$ * $p < .10$

results indicated that when pretest seriousness was controlled for, no significant differences were seen between the video instruction group and the personal instruction group on **perceived seriousness**.

Susceptibility

The data did not support hypothesis 4d in that there were no statistically significant differences between the personal instruction group and the video instruction group on **perceived susceptibility**. This trend held true even when pretest scores were controlled.

Benefits

The data did not support hypothesis 4e in that there were no statistically significant differences between the personal instruction group and the video instruction groups on **perceived benefits**. This trend also held true when pretest scores were controlled.

Barriers

The data did not support **hypothesis 4f** in that there were no statistically significant differences between the personal instruction group and the video instruction group on pretest and posttest **perceived barriers**. Even when pretest scores were controlled for, there were no statistically significant differences.

Motivation

The data did not support hypothesis 4g in that there were no statistically significant differences in pretest and posttest **motivation** scores with regard to type of instruction received. The data further showed that when pretest **motivation** scores were controlled, there was no statistically significant differences between pretest and posttest motivation scores with regard to the type of instruction received.

Compliance

The data did not support hypothesis 4h in that no statistically significant differences were seen between pretest and **posttest compliant behavior** with regard to the type of instruction received. The results from the χ^2 analysis are presented in Table 4-6. The data essentially showed that no statistically significant differences existed between the video group and the personal instruction group with regard to **compliant behavior.**

While some differences were seen on individual responses for some of the HBM subscales, overall, differences between the video instruction group and the personal instruction groups were not statistically significant when pretest scores were controlled.

Hypothesis 5

In order to analyze **hypothesis 5** which stated: *At posttest, knowledge, perceived seriousness, and perceived susceptibility will be the highest predictors of compliance*, several steps had to be performed. Initially, a Spearman Rho coefficient matrix was constructed. The analysis indicated that some of the variables of the Health Belief Model were statistically related. The data showed that the **perceived benefit** was correlated to motivation (.5087). **Perceived susceptibility** and **perceived seriousness** were related (.5007). **Barriers** was related to **susceptibility** (.4370). Although these variables had a statistically significant relationship, the correlations were less than .80, thus the variables were not multicollinear.

Table 4-6

Posttest Compliant Behavior by Type of Instruction Received

N = 50

Variable	Video %	Personal %	p-value
Dusting	92	96	.55
Wash toys	100	100	1.0
Wash hands	88	80	.44
Compliant	80	88	.44

** $p < .05$ * $p < .10$

Compliant is defined as answering "yes" to all three.

Results of the comparison of pretest variables and compliance are shown in Table 4-7. The data showed that at pretest, the only variables with Pearson Chi-Square p-values of .25 or less were perceived seriousness (.14) perceived benefits (.02) and perceived motivation (.06). At posttest, however, only two of these three variables had Pearson Chi-Square p-values of less than .25. At posttest, the variables with Pearson Chi-Square p-values of .25 or less were education (.25), seriousness (.16) and motivation (.07) (See Table 4-8). As such, these three predictor variables were utilized in the multivariate logistic regression model.

Several logistic regression models were run based on the χ^2 analysis results. According to these results, three of the sociodemographic variables (education, income and marital status) met the criteria of having a Pearson Chi-Square p-value of .25 or less. The subscales of the HBM that met this criteria were **perceived seriousness** and **motivation**. As such, a total of three logistic regression models are presented. The models include one of the sociodemographic variables along with the two subscales of the HBM that met the criteria for inclusion in the model.

Table 4-9 is a summary of the odds ratios of the predictors of compliance with perceived seriousness, motivation and education level. The model χ^2 is 7.26 ($p < .06$). When these three variables were included in the model, perceived seriousness had the highest odds ratio (1.28) followed by perceived motivation (1.26). Education had an odds ratio of 1.15. None of these variables were significant at $p < .05$ as the upper 95% confidence intervals crossed 1 on all three variables. Examination of the p-values of the variables in the equation indicated that the p-values all exceeded the .05 level indicating that the findings were not statistically significant.

Table 4-10 summarizes the odds ratios of compliance with perceived seriousness, motivation, and income level. The Model χ^2 was 31.59 ($p < .006$). The data showed that income has the highest odds ratio of 1.3 followed by perceived motivation of 1.25 and seriousness, 1.20. Overall, these three variables were not statistically significant at $p<.05$. Again, the upper 95% confidence intervals for each of the variables crossed 1, thus indicating that the variables were not statistically significant at $p<.05$. Examination of the p-values of the variables in the equation also supported these findings in that the p-values for each of the variables were greater than .05.

Table 4-11 is a summary of the odds ratios of the predictors of compliance with perceived seriousness, perceived motivation and marital status. The Model χ^2 was 8.5 ($p < .05$) Results from this model indicated that marital status had the highest odds ratio (2.0) indicating that married women were twice as likely to comply than unmarried women. The data show that this finding was not statistically significant at $p < .05$ in that the upper and lower 95% confidence interval crossed 1. Additionally, individual p-values of the variables in the equation confirmed that the variables were not statistically significant in that the individual p-values exceeded the .05 level. Perceived seriousness and perceived motivation both had odds ratios of 1.3 and were not statistically significant at $p <.05$ as lower and upper 95% confidence intervals for both variables crossed 1. This finding indicated that as perceived seriousness increased, individuals were 1.3 times more likely to comply than those who did not perceive lead poisoning as a serious disease. The perceived motivation variable followed the same trend. As perceived motivation increased, participants were 1.3 times more likely to comply than those individuals who had a low perceived motivation.

It is concluded that the data did not support **hypothesis 5** in that perceived seriousness, perceived susceptibility and perceived benefits were not the best predictors of compliance. Although several multivariate models are presented, the variables in the models were not statistically significant at $p < .05$.

Table 4-7

Comparison of Sociodemographic Variables and Pretest Compliance (N = 50)

Variable	%Compliant	p-value
Knowledge Low High	 25 19	 .62
Seriousness Low High	 15 30	 .14
Susceptibility Low High	 20 0	 .44
Benefits Low High	 8 35	 .02**
Barriers Low High	 16 25	 .49
Motivation Low High	 11 33	 .06*
Age < 25 >25	 14 36	 .26
Education High School < High School Some College	 27 46 27	 .84
Income < 10,000/year < 10,000/year	 18 27	 .45
Marital Status Married Not Married	 30 19	 .36
Live in Pre '78 Housing Yes No Don't Know	 17 20 31	 .55
Child Been Previously Treated for Lead Poisoning Yes No	 31 19	 .37

** p < .05 * p < .10

Table 4-8

Comparison of Sociodemographic Variables and Posttest Compliance (N = 50)

Variable	%Compliant	p-value
Knowledge		
Low	67	
High	85	.39
Seriousness		
Low	77	
High	92	.16
Susceptibility		
Low	83	
High	100	.36
Benefits		
Low	85	
High	84	.87
Barriers		
Low	82	
High	86	.70
Motivation		
Low	74	
High	93	.07*
Age		
<25	41	
> 25	60	.61
Education		
< High School	33	
High School	31	
Some College	36	.25
Income		
<$10,000 K	57	
>$10,000 K	43	.14
Marital Status		
Married	79	
Not Married	22	.14
Live in Pre '78 Housing		
Yes	86	
No	60	
Don't Know	87	.30
Child Been Previously Treated for Lead Poisoning		
Yes	92	
No	81	.34

** p < .05 * p < .05

Table 4-9

Predictors of Compliance with Health Beliefs and Education

N = 50

Variable	Regression Coefficient	p-value	Odds Ratio	95% Confidence Interval
Seriousness	.25	.07	1.28	.98, 1.67
Motivation	.23	.08	1.26	.97, 1.63
Education	.14	.77	1.15	.44, 2.99

Model χ^2 7.26 $p < .06$

Table 4-10

Predictors of Compliance with Health Beliefs and Income

N = 50

Variable	Regression Coefficient	p-value	Odds Ratio	95% Confidence Interval
Seriousness	.18	.15	1.20	.94, 1.53
Motivation	.22	.13	1.25	.94, 1.66
Income	.28	.06	1.3	.99, 1.75

Model χ^2 31.59 $p < .06$

Table 4-11

Predictors of Compliance with Health Beliefs and Marital Status

N = 50

Variable	Regression Coefficient	p-value	Odds Ratio	95% Confidence Interval
Seriousness	.25	.07	1.3	.98, 1.69
Motivation	.27	.06	1.3	.98, 1.74
Marital Status	.71	.25	2.0	.60, 6.95

Model χ^2 8.5 $p<.05$

CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

Discussion

This study includes a sample of mothers in the City of Norfolk who utilize local WIC clinics and who had at least one child under the age of six. Maternal health beliefs were measured using an adapted version of Russell's (1991) Childhood Injury Prevention Instrument. The sociodemographic variables examined in this study were age of mother, education level of mother, total family income, marital status, number of children and the age of youngest child. The sociodemographic variables that were included in the multivariate logistic regression model examining posttest compliance were education, income, and marital status. Examination of the relationship between previous lead exposure and living in a home built before 1978 and posttest compliance indicated that these two variables were not related to compliance at posttest.

This study finds that posttest compliant behavior was significantly higher than at pretest at $p < .05$ within both the video instruction group and the personal instruction group. A major implication with this finding was that participants in the study were more likely to comply following participation in the program. This finding was considered promising in that some experts suggest that taking the precautionary measures included in the study reduces a child's exposure to lead (Farfeld & Chisolm, 1990). As such, this is an indication that the children of the study participants may now have a lower exposure risk.

The results of this study show a statistically significant difference in pretest and posttest knowledge. These differences are seen overall and within both groups. This finding is promising in that it indicates that participants gained knowledge about childhood lead poisoning. However, due to the limited time that passed during the pretest and posttest administration (1 month), these data have to be interpreted with caution.

When analysis of health beliefs was conducted, not all of the HBM subscales differences were statistically significant between pretest and posttest administration. The current study utilized five subscales of the Health Belief Model. Those subscales were: seriousness, susceptibility, benefits, barriers and motivation.

The **perceived seriousness** variable was statistically significant in the positive direction between pretest and posttest administration ($p < .05$). A possible explanation for this change could have been due to the fact that participants felt that after participation in the maternal lead education program, they saw childhood lead poisoning as a more serious disease. Another explanation for these changes is that as a result of the investigator taking time to do the study, participants may have seen childhood lead poisoning as a more serious disease. The hypothesis associated with this variable was supported by the current study. Perceived seriousness was not a predictor of compliant behavior at posttest. This finding contradicted those of Thuen (1992) who found a high level of **perceived seriousness** predicted parental compliance with regard to taking necessary precautions in protecting children from household hazards.

With regard to **susceptibility**, there was no statistically significance increase in perceived susceptibility between pretest and posttest. The data did not support the hypothesis associated with this subscale. This finding was contradictory to that of Bertakis (1986) wherein the Health Belief Model was utilized to examine the effects of an educational intervention on sick-role behavior. Bertakis' study concluded that mother's perceived susceptibility and benefits of taking action changed significantly in the positive direction.

With respect to perceived benefits of doing things to reduce their child's chances of getting lead poisoned, the pretest and posttest differences were not statistically significant. This finding also contradicted Bertakis' (1986) findings which showed a statistically significant difference in the positive direction of maternal beliefs about the **benefits** of following prescribed medical regimes as they relate to otitis media. A possible explanation for this contradiction could be due to the fact that symptoms of lead poisoning tend to be less acute and less visible than symptoms related to otitis media.

The barriers subscale score showed statistically significant differences between pretest and posttest in the positive direction. This finding was surprising in that it was expected that following either intervention, perceived barriers would decrease. However, **perceived barriers** increased significantly. This finding could indicate that after participating in the lead poisoning education program, mothers were left with the perception that managing a lead poisoned child would require even more of their time and financial resources.

When a comparison was made on the pretest and post **motivation** scores, there were no statistically significant differences in pretest and posttest scores. The data from the current study did not support the hypothesis associated with this subscale in terms of an increase in **perceived motivation** at posttest. It was also determined that at posttest, motivation was not a predictor of compliance. This finding was contradictory to that of Schonfeld, et. al., (1963) who utilized the Health Belief Model to address maternal health beliefs as they related to tuberculosis screening. The researchers found that maternal health beliefs were motivating factors in compliance.

Another finding from the current study indicated that when a comparison was made on the two intervention strategies, there were no statistically significant differences in the magnitude of changes in knowledge, health beliefs, and compliance. This finding has a major implication since lead poisoning education is not a part of the services typically received during WIC clinic visits, the use of this (or videos that contain similar information about childhood lead poisoning) could be beneficial in these clinics. In other words, the data indicated that use of this type of instructional materials could have some benefits to children at risk of being exposed to lead. This is especially true when one considers that the same population who utilize public health clinics is at the highest risk of realizing childhood lead poisoning. The findings from the study suggest that an intervention of this nature could be a useful tool in the prevention of childhood lead poisoning.

Finally, this finding was similar to that of O'Donnell, San Doval, Duran and O'Donnell (1995). The researchers found video instruction to be a viable means by which to impact knowledge, attitudes and behaviors relative to condom use and acquisition among patrons of a sexually transmitted disease clinic.

As previously stated, the Health Belief Model was the theoretical framework used in the current study. The Health Belief Model contends that knowledge and perceptions about health beliefs are predictors of compliance. It was hypothesized that perceived seriousness, susceptibility and knowledge would be the highest predictors of compliance at posttest. The current study, did not, however, support this. Under the current study, knowledge and subscales of the Health Belief Model were not statistically significant predictors of compliance.

Several explanations for this finding exist. Many of the previous studies that utilized the Health Belief Model involved assessing individual health beliefs regarding diseases that had more pronounced symptoms. For example, in the study by Becker, et al, (1977) found that beliefs about susceptibility seriousness, benefits, and barriers to be related to subsequent weight loss in obese children. Obesity is a disease wherein compliant behavior change can be directly observed. However, in the case of lead poisoning, because the illness is oftentimes asymptomatic, health beliefs may not adequately predict compliance. Also, in measuring compliance related to preventing lead poisoning, it is difficult to validate compliance. In the case of the study by Thuen (1992) which used the Health Belief Model to predict compliance related to childhood injury prevention, again, compliance to prescribed actions regarding injury prevention can be readily and directly observed. Finally, in the Bertakis (1986) study where the Health Belief Model was utilized to predict compliance with administering prescribed medications for ear infections, health beliefs may have been predictors of compliance in that acute otitis media is an illness in which mothers were likely to comply as a result of their ability to immediately and directly observed the results of their compliant behavior.

Another explanation of the data not supporting the Health Belief Model in the current study is that at its inception, the Health Belief Model was developed and studied on groups with differing demographics than the individuals in the current study. Perhaps the current study draws attention to the fact that consideration should be given to the idea that health care behaviors for all ethnic and cultural groups cannot be modeled in the same way. The possibility also exists that the instrument used in the current study did not measure the concepts of the theory very well.

The information and data discussed in this study lend support to the effectiveness of both educational interventions utilized. The study has demonstrated that both interventions had some impact on knowledge, health beliefs and compliance. It should be noted that the "personal" intervention utilized in the current study consisted of reading a script to the mothers and a more interactive teaching model which involved the mothers and their individual concerns might have produced different results.

The educational intervention programs may be said to have achieved some effects on compliance. When comparison was made between the two educational intervention modalities, overall, statistically significant differences were not seen. Thus, it may be concluded that both interventions were equally as effective.

Educational interventions can be viewed as being most effective in increasing knowledge about childhood lead poisoning. Respondents' knowledge level about lead poisoning prevention increased significantly between pretest and posttest. It is likely that the information contained in both interventions gave mothers a greater sense of how children come into contact with lead in their environments. Another explanation for the increase in posttest increases in knowledge could have been due to participant's sensitization to the pretest which may have served as a cue to the mothers about what to learn about lead poisoning.

With regard to perceived barriers, it appears that the educational intervention had a more negative impact on this subscale. Although the differences were statistically significant pretest and posttest, these differences were in the positive direction. Since this item was negatively worded on the questionnaire, an increase in the positive direction indicated that maternal perceptions regarding existing barriers to adequate health care as it relates to lead poisoning were greater. A possible explanation for this is that mothers may have viewed the blood lead screenings as something that would consume even more of their time at clinic visits. Support for this claim lies in the fact that clinic appointments generally require a 3 to 4 hour wait. As such, a perception of having to spend more time in the clinic or rearrange their schedules to incorporate the care necessary in managing a lead poisoning child may have created yet another perceived barrier.

Clinical Impact/Usefulness

From a cost-benefit standpoint, reproducing the video for in home viewing or as part of the routine clinic visit would be far less expensive than it would be to treat a lead poisoned child. As stated previously, society spends nearly $4,000 per year in special education costs alone in meeting the needs of lead poisoned children. This figure does not include the required medical treatment costs involved in managing these children. The medical treatment costs for a lead poisoned child range from $53 for venipuncture, laboratory test, and follow-up visit to $8,000 for chelation therapy. The cost of reproducing the video would be approximately $2 each.

The current study finds that the use of videos in imparting knowledge relative to childhood lead poisoning could be beneficial in communicating with mothers about this totally preventable disease. Used in conjunction with routine health education practices, it might be a viable option in reducing the number of children who become lead poisoned. Anecdotally, in observing the behavior of clinic users, video communication could possibly be more effective than written materials in that few of the brochures made available to clinic patrons were read while patients were waiting to be seen by the clinic staff.

The current study results indicate that the use of the lead-poisoning video instruction has possible usefulness in clinical settings. While the video was shown to have some usefulness, consideration would have to be given to how the video would be shown. To show the video while the mothers are waiting to be seen by other health professionals could possibly yield different results if the video was shown to each mother one-on-one at some point during their visit to the clinic.

Other clinical considerations would have to do with the client load of the clinics. Since mothers who bring their children to these WIC clinics are already there for a period of up to three hours in some cases, finding time to show the video could become problematic for clinic personnel. As such, careful consideration would have to be given to the most effective times to show the video during clinic visits.

Another potential use of the video would involve the clinics making copies and having them readily available to the mothers to view at home. With regard to cost effectiveness, it would be far less expensive to make videos available to mothers regarding the health hazards of lead as opposed to having to over utilize current staff members or go to the expense of hiring additional staff. The use of the video instruction could also become a part of child health fairs and used in conjunction with lead screening activities. As previously stated, showing the video while clients wait to be seen by health care professionals may yield very different results than if a client was given an individual copy to take home and view at their leisure.

<u>Limitations</u>

This study is not without limitations. One methodological concern is a limited sample size (N=50). Small sample sizes often compromise generalizability. The current study has low power in detecting significance due to a limited sample size. Also, the sampling method utilized in the study has limitations. The current study did not lend itself to both random selection and random assignment. As a result, it would be difficult to generalize these findings to the general population.

The external validity of the findings may be affected by the fact that those individuals in the study cohort were similar on sociodemographic variables and race. The cohort was 94% African-American. This suggests the study findings may be generalized to low-income adult African-American women residing in urban areas. The findings may not be applicable to African-American and for women of other ethnic groups with different sociodemographic profiles. Evaluation of this program with African American women with different sociodemographic profiles may help establish its generalizability across socioeconomic groups. Finally, social desirability bias cannot be overlooked as an explanation of the statistically significant changes in posttest compliance. It is plausible that the participants in the study answered positively to being compliant in order to please the investigator.

The methodological issue associated with self-reported outcome measures lies in the fact that it is impractical to directly observe participants housekeeping practices to determine whether or not they are in compliance with recommended guidelines. Finally, the length of the study follow-up period (1 month), may not have been long enough. This was given consideration but in an effort to reduce attrition, a one month follow-up period was deemed appropriate. Long-term follow-up is necessary since newly adopted housekeeping practices (compliance) and newly acquired knowledge must be long lasting in order to be meaningful.

Future Research and Recommendations

One of the difficulties in conducting this type of research is finding individuals who have the time to participate. Obtaining a large sample size in order to make the results more generalizable can often be a difficult task to accomplish in a setting where participants are required to see other health care professionals during the same morning or afternoon. In the case of children being present, it is often difficult to keep the children from becoming restless. This became a problem with the current study. Many of the mothers were unable to participate due to time constraints. Some of the mothers who were unable to participate indicated that they had other commitments immediately following their clinic appointments.

A future study might involve having mothers in a more captive setting. This would involve conducting the research at a time separate from their clinic appointments. Some experts have suggested setting up an intervention program within the targeted communities at the local church or community center. This type of study would require creative and extensive advertising and could quite possibly require some type of incentive for participation (arranged child care, monetary rewards, meals).

Another dimension that could be added to the current research is to conduct a study that is longer in duration. For example, using a research design that would measure changes in knowledge, health beliefs and compliant behavior over time. Under the current study, one month between the pretest and posttest administration may not have been as effective as having the ability to measure the outcome variables over a period of time. For example, a future study could measure knowledge, health beliefs at intervals of one month, six months and one year following participation in the education program.

Follow-up steps for the current study might include following up with participants in the current study and measure the children's blood lead levels over time to see whether their blood lead levels increased or decreased. Another key follow-up step would be to measure health beliefs, knowledge and compliant behavior of study participants over time using a comparable instrument as participants may have memorized items on the current instrument.

A future study might include utilizing a more culturally sensitive health education intervention and examining whether this type of group-specific intervention would be effective in supporting the Health Belief Model. Russell and Jewel (1992) contend that for African Americans, regardless of income and education, cultural beliefs and health practices are related (Russell and Jewel, 1992). Arguably, health care regimes within the current health care delivery system often fail to meet the needs of African Americans, particularly those with low incomes. This is evidenced by the fact that many of the current health education models used to date do not integrate the cultural values of African Americans.

There are several common cultural attributes that can be identified among African Americans. These include religion, social support networks and informal health care systems. A study by Roberson (1985) found an association between religious beliefs and health beliefs. Other studies have found that among African Americans prayer is often used as a way to deal with worries and other health care issues (Specter, 1985 and Gibson, 1982).

Support systems utilized by African Americans are important in sick role behavior. Lassiter (1987) found that African Americans are more likely to consult a family member or friend when dealing with health problems than a health care professional. As such, the more the family members are educated about the dangers of childhood lead poisoning, the more children are likely to be protected.

Under the current study, the limited sample size, sampling methods and homogeneous characteristics of the sample population were identified as limitations to the generalizability of the results. Future studies could include a larger sample size that would comprise a more heterogeneous sample. Finally, a future study could include a control group to examine the extent to which differences are seen between the two interventions as compared to receiving no intervention at all. The presence of a control group would also give an estimate of the overall impact of the pretest and posttest.

Although lead poisoning continues to be a problem that plagues predominately inner-city, low-income children, it is still a potential risk for those non minority, middle and high income children who reside in the city center. In many cities, there are still neighborhoods within the city center that comprise non-minority, middle to high income families who live in homes that were built prior to 1978. Future research should include these groups. The use of civic leagues and other community organizations within the neighborhoods would be a viable way to obtain a subject pool.

Overall, the video and personal instruction modalities utilized in the current study were shown to be effective in increasing posttest knowledge regarding childhood lead poisoning. Although perceived barriers increased at posttest, these perceptions did not interfere with posttest compliance. Since perceived susceptibility, motivation, and benefits did not change significantly between pretest and posttest under the current study, a future study might include a culturally sensitive component that focuses on these concepts.

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APPENDIX A

CONSENT FORM FOR PARTICIPATION IN SOCIAL/BEHAVIORAL SCIENCE RESEARCH

Consent Form for Participation in Social/Behavioral Science Research

Name of Study: The Effects of a Maternal Childhood Lead-Poisoning Education Program on Knowledge, Health Beliefs, and Compliance

Investigator: Sylvia E. Johnson, M.S.
Telephone: 588-2045
Dr. John L. Echternach, Research Chair
Telephone: 683-4519

I consent to participating in the above research. The purpose of the study, the procedures to be followed, and the length of my participation have been explained to me. Possible benefits of the study have been described. The only risk associated with this study is the time required to participate.

I have had the opportunity to get additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Further, I understand that I am free to withdraw consent at any time.

I understand that neither myself nor my child will in any way be identified when the results of the study are presented. Only the researchers will have access to the master list of names of participants. I understand that all data will be maintained in a safe location and destroyed after the project is completed.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. a copy has been given to me.

____________________________ ________________________
Signature Date

I certify that I have explained to the above individual the nature and purpose of the study, potential benefits and possible risks associated with participation in this study. I have answered any questions that have been raised and have witnessed the above signature.

____________________________ ________________________
Signature Date

APPENDIX B

PRETEST

The following information is requested as background. Information will not be used to identify you or your child in any way.

Name____

Address______________________________________

City, State, Zip Code ____________________________

Telephone Number (Home) ______________ Work__________

1. Race:
   _____ African American (Non-Hispanic)
   _____ White (Non-Hispanic)
   _____ Native American or Alaska Native
   _____ Asian or Pacific Islander
   _____ Hispanic
   _____ Non-resident Alien
   _____ Other

2. Age:
   _____ less than 18 years
   _____ 19-24 years
   _____ 25-34 years
   _____ 35-44 years
   _____ 45 +

3. Highest level of education:
   0-8 years ______
   8-11 years _____
   High School Graduate or GED _____
   Some College _____
   College Graduate _____
   Master's Degree _____
   Doctorate Degree _____

4. Total family Income
   _____ 0-$9,999
   _____ $10,000-$24,999
   _____ $25,000-$34,999
   _____ $35,000-$44,999
   _____ $45,000 +

5. Marital Status
   _____ Single
   _____ Married
   _____ Separated
   _____ Divorced

Your Occupation:

Spouse's Occupation:

6. Number of children living in your home_____
7. Age(s) ____________

8. Do you have health insurance? _____ Yes _____ No
   If yes, type:
   HMO _____ CHAMPUS _____ Blue Cross/Blue Shield _____
   Medicaid _____ Other _____

9. Does your child have a pediatrician?
   _____ Yes _____ No

10. Where do you take your child for medical treatment?
   _____ Private Physician
   _____ Hospital emergency room
   _____ Health Department
   _____ Other

11. Distance traveled to clinic:

   _____ less than 1 mile
   _____ 1 to 5 miles
   _____ 6 to 10 miles
   _____ 11 to 15 miles
   _____ 16 to 20 miles
   _____ more than 20 miles

12. Have you lived in or was your current home or apartment building constructed before 1978?
   _____ Yes _____ No Don't Know _____

Below is a series of true and false statements. Please answer based on your knowledge about lead.

13a. Lead poisoning in children is the most serious health problem for children today.

13b. There is nothing that can be done to prevent lead poisoning.

13c. Lead-based paint is a common source of lead.

13d. Damp mopping floors and windows is a good way to reduce lead exposure.

13e. Soil can become contaminated with lead from chipping paint or old leaded gas.

13f. Children should be kept from playing in old soil along the sides of buildings.

13g. Good nutrition is not important in managing a lead-poisoned child.

13h. It is okay for children and pregnant women to continue to live in a house that has lead-based paint and remodeling is being done.

13i. Parents/guardians should wash their child's hands often, especially before eating and after playing.

13j. Lead-poisoning can cause slow development in children.

Please circle the answer that most closely describes your level of agreement with the following statements.

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

<u>Seriousness</u>

14a.	I consider lead poisoning to be a serious health problem for my child.	1	2	3	4	5
14b.	When I think about my child getting lead poisoning I feel scared.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

14c. Lead poisoning in children is a hopeless disease.	1	2	3	4	5
14d. I am worried about my child's blood lead level.	1	2	3	4	5
14e. I am afraid when I think about childhood lead poisoning.	1	2	3	4	5
14f. Problems my child could have from lead poisoning will last a very long time.	1	2	3	4	5
<u>Susceptibility</u>					
15a. My child's chances of getting lead poisoning are great.	1	2	3	4	5
15b. My child's health makes it likely that he/she will get lead poisoning.	1	2	3	4	5
15c. feel that my child's chances of getting lead poisoning in the future are great.	1	2	3	4	5
15d. There is a good chance that my child will get lead poisoned.	1	2	3	4	5
15e. I worry a lot about my child getting lead poisoned.	1	2	3	4	5
15f. Within the next year, my child will get lead poisoned.	1	2	3	4	5
<u>Benefits</u>					
16a. There are things I can do to reduce my child's chances of getting lead poisoned.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

16b. I have a lot to gain by having my child's blood lead level checked.	1	2	3	4	5
16c. When I do things to improve my child's health, I feel good about myself.	1	2	3	4	5
16d. My family praises me if I do things to improve my child's health.	1	2	3	4	5
16e. My friends praise me if I do things to improve my child's health.	1	2	3	4	5
Barriers					
17a. I don't have enough money to do things to improve my child's health.	1	2	3	4	5
17b. I don't have a way to take my child for medical check-ups.	1	2	3	4	5
17c. I am concerned that the blood lead level test is painful for my child.	1	2	3	4	5
17d. In order to take my child to the doctor, I have to make changes in my schedule.	1	2	3	4	5
17e. Trying to improve my child's health is too hard.	1	2	3	4	5
17f. Doing things to improve my child's health takes too much time.	1	2	3	4	5
Motivation					
18a. My child eats a well-balanced diet.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

18b. I always follow doctors orders where my child is concerned.	1	2	3	4	5
18c. I feel the treatment my child gets will benefit his/her health.	1	2	3	4	5
18d. I often do things to improve my child's health.	1	2	3	4	5
18e. I give my child vitamins.	1	2	3	4	5
18f. I look for new information about childhood lead poisoning.	1	2	3	4	5

19. When dusting my home, I:

_____ Use a dry cloth.
_____ Use a damp cloth with detergent.

20 Has your child been seen or treated for lead poisoning a local Department of Health? _____Yes _____No

21 Do you wash your child's toys before he/she plays with them? ____Yes ____No

22 Does your child wash his/her hands before eating? _____Yes _____No

APPENDIX C

POSTTEST

The following information is requested as background. Information will not be used to identify you or your child in any way.

Name____

Address____

City, State, Zip Code ________________________________

Telephone Number (Home) ______________ Work___________

Race:

_____ African American (Non-Hispanic)
_____ White (Non-Hispanic)
_____ Native American or Alaska Native
_____ Asian or Pacific Islander
_____ Hispanic
_____ Non-resident Alien
_____ Other

Age:

_____ less than 18 years
_____ 19-24 years
_____ 25-34 years
_____ 35-44 years
_____ 45 +

Highest level of education:

0-8 years ______
8-11 years _____
High School Graduate or GED _____
Some College _____
College Graduate _____
Master's Degree _____
Doctorate Degree _____

Total family Income

_____ 0-$9,999
_____ $10,000-$24,999
_____ $25,000-$34,999
_____ $35,000-$44,999
_____ $45,000 +

Marital Status
_____ Single
_____ Married
_____ Separated
_____ Divorced

Your Occupation:

Spouse's Occupation:

Number of children living in your home_____
Age(s) _____________

Do you have health insurance? _____ Yes _____ No
If yes, type:
HMO _____ CHAMPUS _____ Blue Cross/Blue Shield _____
Medicaid _____ Other _____

Does your child have a pediatrician?
_____ Yes _____ No

Where do you take your child for medical treatment?

_____ Private Physician
_____ Hospital emergency room
_____ Health Department
_____ Other

Distance traveled to clinic:

_____ less than 1 mile
_____ 1 to 5 miles
_____ 6 to 10 miles
_____ 11 to 15 miles
_____ 16 to 20 miles
_____ more than 20 miles

Have you lived in or was your current home or apartment building constructed before 1978?
_____ Yes _____ No Don't Know _____

Does your child wash his/her hands before eating? _____Yes _____No

Do you wash your child's toys before he/she plays with them? ____Yes ____No

Has your child been seen or treated for lead poisoning a local Department of Health?
_____Yes _____No

When dusting my home, I:

____ Use a dry cloth.

____ Use a damp cloth with detergent.

Please circle the answer that most closely describes how you feel about the following statements:

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

Motivation					
I look for new information about childhood lead poisoning.	1	2	3	4	5
I give my child vitamins.	1	2	3	4	5
I often do things to improve my child's health.	1	2	3	4	5
I feel the treatment my child gets will benefit his/her health.	1	2	3	4	5
I always follow doctors orders where my child is concerned.	1	2	3	4	5
My child eats a well-balanced diet.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

<u>Barriers</u>

Doing things to improve my child's health takes too much time.	1	2	3	4	5
Trying to improve my child's health takes too much time.	1	2	3	4	5
In order to take my child to the doctor I have to make changes in my schedule.	1	2	3	4	5
I am concerned that the blood lead level test is painful for my child.	1	2	3	4	5
I don't have a way to take my child for medical check-ups.	1	2	3	4	5
I don't have enough money to do things to improve my child's health.	1	2	3	4	5

<u>Benefits</u>

My friends praise me if I do things to improve my child's health.	1	2	3	4	5
My family praises me if I do things to improve my child's health.	1	2	3	4	5
When I do things to improve my child's health, I feel good about myself.	1	2	3	4	5
I have a lot to gain by having my child's blood lead level checked.	1	2	3	4	5
There are things I can do to reduce my child's chances of getting lead poisoning.	1	2	3	4	5

1 = Strongly Disagree
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

<u>Susceptibility</u>					
Within the next year, my child will get lead poisoned.	1	2	3	4	5
I worry a lot about my child getting lead poisoned.	1	2	3	4	5
There is a good chance that my child will get lead poisoned.	1	2	3	4	5
I feel that my child's chances of getting lead poisoning in the future are great.	1	2	3	4	5
My child's health makes it likely that he/she will get lead poisoned.	1	2	3	4	5
My child's chances of getting lead poisoned are great.	1	2	3	4	5
<u>Seriousness</u>					
Problems my child could have from lead poisoning will last a very long time.	1	2	3	4	5
I am afraid when I think about childhood lead poisoning.	1	2	3	4	5
I am worried about my child's blood lead level.	1	2	3	4	5
Lead poisoning in children is a hopeless disease.	1	2	3	4	5
When I think about my child getting lead poisoned I feel scared.	1	2	3	4	5
I consider lead poisoning to be a serious problem for my child.	1	2	3	4	5

Below is a series of true and false statements. Please answer based on your knowledge about lead.

1. Lead-poisoning can cause slow development in children.
2. Parents/guardians should wash their child's hands often, especially before eating nutrition is not important in managing a lead-poisoned child.
3. It is okay for children and pregnant women to continue to live in a house that has lead-based paint and remodeling is being done.
4. Good nutrition is not important in managing a lead-poisoned child.
5. Children should be kept from playing in old soil along the sides of buildings.
6. Soil can become contaminated with lead from chipping paint or old leaded gas.
7. Damp mopping floors and windows is a good way to reduce lead exposure.
8. Lead-based paint is a common source of lead.
9. There is nothing that can be done to prevent lead poisoning.
10. Lead poisoning in children is the most serious health problem for children today.

APPENDIX D

SCRIPT FOR PERSONAL INSTRUCTION

Poison: It's one of the many concerns facing any parent. Throughout a typical home can be found the everyday threats to good health and even life. But while less obvious, there's one source of poison surrounding millions of unaware children and adults in virtually every part of the United States. In fact, the Environmental Protection Agency currently estimates that over 3 million children under the age of six have a blood lead level greater than 10.

It's a poison responsible for problems ranging from excitability and hyperactivity to mental retardation and at times even death.

Lead is a material that for thousands of years has served as a valuable resource. Unfortunately, lead poisoning is a problem of epic proportions. During the next several minutes, you'll learn the sources of lead poisoning with special emphasis on lead based paints. You'll also learn the steps you can take to minimize the risks of lead poisoning confronting you and your family and where to seek help if you think your child has been exposed to a lead source.

From vehicles exhausts to some of the food we eat everyday, the presence of lead in our environment is common and widespread. Water contaminated by lead piping, soil, battery casings, antique pewter, industrial emissions and even dishes and food storage containers often contain lead. But perhaps the most prevalent source of lead poisoning is from lead based paint. Prior to 1978 many different types of paint used throughout the United States possessed lead. In many cases, as much as 50% of a paint's total composition was lead. Think about it, the paint used on millions of American homes contains high amounts of poisonous lead.

It is estimated that more than 5 million tons of lead were used in paints during the past century: windows and sills, walls, floors, doors and their frames, molding and baseboards, cabinets and shelves, heating radiators and pipes, railings, porches and fences and even toys and furniture can be coated with poisonous lead based paints. In summary, virtually any painted surface could be a source of lead poisoning. Since 1978 regulations have been adopted that limit the amount of lead used in the manufacturing of paints. But the dangerous reality can't be denied. Millions of children and adults are exposed to lead based paint and other sources on a daily basis.

Now that we have a pretty good idea where lead can be found, let's take a look at the dangers it presents. Obviously adults are at risk; some more than others. But it is children whose bodies absorb and store lead most readily. Children ingest lead through a variety of methods. One of the properties often found in lead based paint is a sweet pleasant taste; a taste that entices children to chew and swallow paint chips again and again. Inhaling leaded dusts as well as chewing or sucking on toys and other objects covered with lead residues are two additional ways children subject themselves to lead poisoning.

Unborn children are at even greater risk since they passively absorb lead ingested by their mothers. At low levels, the effects of lead poisoning aren't easily noticed. Still the consequences are severe. Low level lead poisoning can slow a child's mental and physical development, hinder red blood cell production and cause a variety of behavioral and learning difficulties including the inability to pay attention, to speak properly and to learn at a normal rate. These effects, without question, will plague a child throughout life.

When higher levels of lead are present in children, more devastating effects results, like irreversible mental retardation, paralysis, kidney and liver disorders, comas and even death all too often result from high level lead poisoning. To make things even worse, there are no recognizable signs of low level lead poisoning. High level exposure to lead can bring about symptoms that might be attributed to other childhood sicknesses. Symptoms caused by high level lead poisoning can include: stomach aches and cramps, fatigue, irritability, frequent vomiting, headaches, constipation, sleeping disorders, a poor appetite, and seizures.

Lead in the human is found not only in blood. It can also be stored in the victims soft tissue and bones. It is extremely difficult, painful and expensive to remove the lead from a child's blood, soft tissues and bones. As the victims body stores more and more lead, he or she often becomes extremely weak and clumsy even to the point of losing recently acquired skills.

It's important to realize that the threat of lead poisoning exists in virtually every area of our county. City children living in old, poorly maintained housing or in homes undergoing renovation are in the greatest danger but suburban and rural children are also at risk. Homes possessing peeling, chipping or chalking paint as well as those under renovation pose an immediate and serious threat to their inhabitants. It is also a sad but proven fact that under nourished children are at even greater risk since their bodies so readily accept lead, mistaking it for the nutrients their bodies crave.

The hazards of lead poisoning are well documented. In fact, when looking at the most serious health risks in the U.S. today, lead poisoning ranks high.

The question is: does lead exit in your children's environment? Unfortunately, the answer in most cases is yes---at least to some extent lead does exist with painted surfaces the most obvious culprit. When determining whether or not your home includes lead based painted surfaces, it is best to assume the worst.

Health and housing agencies should be able to tell you who to contact to have your painted surfaces analyzed. But if testing is unavailable or too costly, you should assume that older painted surfaces contain lead. Remember prior to 1978, lead was often an ingredient in the paints used in homes throughout the nation. the older the home, the more likely it was to contain dangerous leaded paints. But eliminating the problem is no simple task. Removing lead based paint is a job for professionals trained and equipped to handle hazardous materials. If the dusts and chips generated by removing the paint aren't carefully controlled, the area becomes more dangerous than ever. Even though it takes a professional to safely and completely remove the hazardous lead based paint, there are several things you can do to minimize the risks of lead poisoning confronting your children everyday.

Good housekeeping is a must. Be alert for chipping, chalking and flaking paints. Any paint chips that have accumulated on the floor should be wet mopped into a neat pile, misted for proper dust containment and carefully placed into a plastic bag tightly sealed for proper disposal. Walls exhibiting chipping, chalking or flaking paint should be misted with water and the debris carefully removed and collected in a neat pile. Once again, the hazardous material should be wetted and placed in a plastic bag. Surfaces from which lead based paint remnants have been removed should then be wiped with a high phosphate detergent and coated with safe non-leaded paint.

I've tried to emphasize how crucial it is to keep areas containing paint chips or dust wet. Simply put: lead dusts, like any other dust can become airborne and easily inhaled. Wet mopping and misting, however, is the best method for controlling the poisonous dust. On the other hand, sweeping or vacuuming leaded dust and chips can make matters worse by propelling the poison into the air we breathe. Again, these are basic precautions to take when contact with lead based paint is unavoidable.

This information is to make you aware of the dangers of leaded materials and should not be mistaken for detailed lead removal instructions. Clothes worn during the handling of lead based paint debris should be placed into plastic bags and laundered separately. But before any lead based paint removal projects are undertaken, children, pregnant women and women with high blood pressure should be removed from the area. These high risk groups must never be in the vicinity of lead removal projects even when performed by professionals. It is also important to feed your children well balanced meals low in fat and high in iron and calcium. Make your children wash their hands before each meal. Of course, you should also monitor what your children put into their mouths while they're playing. You don't have to wait for any signs that your children have been exposed to damaging levels of lead. Regular screening and detection could be a life saver.

All children should be tested at 6 months. Following this visit to their pediatric health care provider, the frequency of screening is dependent upon the results of the initial blood test. Simple finger stick blood tests can determine whether or not excessive amounts of lead have entered into the child's body. If the test proves positive additional blood testing and even x-rays may be required. If medical treatment is advised, repeated stays in the hospital could be necessary pediatricians, family physicians, public health departments, child care centers, head start programs, WIC programs and health clinics can give you give you all the details concerning child lead screening programs.

From automobile batteries to x-ray shields, lead serves many important uses, but when ingested into the human body, lead is a life-threatening poison. I've shown you where lead is often found and I've also detailed the prevalence and inherent dangers of surfaces coated with lead based paints. Peeling, chipping or chalking paint calls for immediate attention but must be handled carefully and responsibly. I can't emphasize enough that lead based paint removal should be left to experienced professionals.

Remember, children, pregnant women, and adults with high blood pressure should never, under any circumstances, be in the vicinity of any lead based paint removal. There are many agencies ready to respond to your questions or concerns regarding lead poisoning. Most importantly, it is vital to realize that while lead poisoning is a serious and widespread disease, it is also one that is totally avoidable. Each one of us has a responsibility to protect our children, our loved ones and ourselves by being watchdogs guarding against the threat of lead poisoning.

APPENDIX E

PRETEST/POSTTEST FREQUENCY DISTRIBUTION TABLES

Table E-1

Summary of Pretest Responses

N = 50

Question and Item Number	Percentage Answering Correctly		
Knowledge	All	Personal	Video
Q#13a lead poisoning is most serious health problem for children today	76	72	80
Q#13b nothing can be done to prevent lead poisoning	78	72	84
Q#13c lead-based paint is common source of lead	90	88	92
Q#13d damp mopping floors and windows reduces exposure to lead**	42	72	56
Q#13e soil can become contaminated with lead drom chipping paint or old leaded gasoline	92	96	88
Q#13f children should be kept from playing in old soil along sides of buildings	94	96	92
Q#13g good nutrition is not important in managing a lead poisoned child	76	84	68
Q#13h okay for children and pregnant women to continue to live in a house with lead based paint	96	92	100
Q#13i parents should wash child's hands often, before eating and after playing	100	100	100
Q#13j lead poisoning can cause slow development in children*	88	80	96
Total Score Mean	8.32 (1.531)	8.08 (1.32)	8.56 (1.71)*

** $p<.05$ * $p<.10$ by the Mann-Whitney U-Test of significant difference between personal and video group

Table E-2

Summary of Posttest Responses

N=50

Question and Item Number	Percentage Answering Correctly		
Knowledge	All	Personal	Video
Q#13a lead poisoning is most serious health problem for children today	98	96	100
Q#13b nothing can be done to prevent lead poisoning	94	96	92
Q#13c lead-based paint is common source of lead	98	96	100
Q#13d damp mopping floors and windows reduces exposure to lead *	78	68	88
Q#13e soil can become contaminated with lead drom chipping paint or old leaded gasoline	100	100	100
Q#13f children should be kept from playing in old soil along sides of buildings	100	100	100
Q#13g good nutrition is not important in managing a lead poisoned child	96	96	96
Q#13h okay for children and pregnant women to continue to live in a house with lead based paint	98	100	96
Q#13i parents should wash child's hands often, before eating and after playing	100	100	100
Q#13j lead poisoning can cause slow development in children	96	92	100
Mean Total Correct	9.58 (.731)	9.44 (.768)	9.72 (.678)

**p<.05 *p < .10 by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-3

<u>Summary of Each Item of the Questionnaire (Pretest)</u>

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
<u>Seriousness</u>	SD	D	U	A	SA	% SA
Q#14a lead poisoning a serious health threat to my child	2	8	10	20	60	80
Q#14b thinking about lead poisoning scares me	0	2	4	40	54	94
Q#14c lead poisoning is hopeless disease	26	30	22	16	6	22
Q#14d worried about child' blood lead level	4	14	4	44	34	78
Q#14e afraid when I think about childhood lead poisoning	6	6	0	50	38	88
Q#14f problems from lead poisoning could last a long time *	0	14	10	40	36	76

Total Score Mean 23.160 (3.765)

Cronbach Alpha .6572

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-4

Summary of Each Item of the Questionnaire (Posttest)

SD = Strongly Disagree   D = Disagree   U = Undecided   A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Seriousness	SD	D	U	A	SA	%SA
Q#14a lead poisoning a serious health threat to my child	2	8	2	30	58	88
Q#14b thinking about lead poisoning scares me	0	6	0	30	64	94
Q#14c lead poisoning is hopeless disease	26	42	10	20	2	22
Q#14d worried about child' blood lead level	0	12	6	40	42	84
Q#14e afraid when I think about childhood lead poisoning	0	4	2	50	44	94
Q#14f problems from lead poisoning could last a long time **	0	8	6	34	52	86

Total Score Mean 23.92 (3.187)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-5

Summary of Each Item of the Questionnaire (Pretest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	% D
Q#15a child's chances of getting lead poisoning are great	6	32	26	30	6	38
Q#15b child's health makes it likely that they will get lead poisoned	12	48	24	10	6	60
Q#15c child's future chances of getting lead poisoned are great *	12	36	26	16	8	48
Q#15d good chance my child will get lead poisoned **	12	36	28	18	6	48
Q#15e I worry a lot about my child getting lead poisoned	4	36	10	34	16	40
Q#15f within a year, my child will be lead poisoned	10	50	24	12	4	60

Total Score Mean 16.60 (4.886)

Cronbach Alpha .8453

Cronbach Alpha .7846 (after deleting Q#15d)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-6

Summary of Each Item of the Questionnaire (Posttest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	%D
Q#15a child's chances of getting lead poisoning are great	6	36	18	34	6	42
Q#15b child's health makes it likely that they will get lead poisoned	12	48	22	14	4	60
Q#15c child's chances of getting lead poisoned are great	12	34	18	26	10	46
Q#15d good chance my child will get lead poisoned	12	34	20	24	10	46
Q#15e I worry a lot about my child getting lead poisoned	6	28	6	38	22	34
Q#15f within a year, my child will be lead poisoned	12	42	24	16	6	54

Total Score Mean 17.26 (5.386)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-7

Summary of Each Item of the Questionnaire (Pretest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	% SA
Q#16a things to reduce child's chances of lead poisoning	0	10	6	40	44	84
Q#16b lot to gain by having lead level checked	2	4	0	24	70	94
Q#16c improving my child's health makes me feel good about myself	2	4	2	16	76	92
Q#16d family praises me when I do things to improve child's health	2	4	12	26	56	82
Q#16e friends praise me when I do things to improve child's health	0	8	12	38	42	80

Total Score Mean 21.78 (3.454)

Cronbach Alpha .8110

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-8

Summary of Each Item of the Questionnaire (Posttest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	%SA
Q#16a things to reduce child's chances of lead poisoning	0	2	6	40	52	92
Q#16b lot to gain by having lead level checked	0	2	0	28	70	98
Q#16c improving my child's health makes me feel good about myself	0	2	2	22	74	96
Q#16d family praises me when I do things to improve child's health *	0	2	8	32	58	90
Q#16e friends praise me when I do things to improve child's health	0	2	8	42	48	90

Total Score Mean 22.58 (2.434)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-9

Summary of Each Item of the Questionnaire (Pretest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	% D
Q#17a don't have enough money to do things to improve my child's health *	30	44	10	8	8	74
Q#17b don't have a way to take my child for medical checkups	32	46	6	12	4	78
Q#17c concerned that blood lead test is painful for my child	14	30	22	20	14	44
Q#17d have to change my schedule to take my child to the doctor	20	34	10	16	20	54
Q#17e trying to improve my child's health is too hard	42	34	8	10	6	76
Q#17f doing things to improve my child's health takes too much time	54	34	2	4	6	88

Total Score Mean 12.060 (4.386)

Cronbach Alpha .7365

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-10

Summary of Each Item of the Questionnaire (Posttest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	%SD
Q#17a don't have enough money to do things to improve my child's health	28	48	6	12	6	76
Q#17b don't have a way to take my child for medical checkups	30	50	6	10	4	80
Q#17c concerned that blood lead test is painful for my child	12	42	16	20	10	54
Q#17d have to change my schedule to take my child to the doctor	22	36	4	20	18	58
Q#17e trying to improve my child's health is too hard	38	46	2	10	4	84
Q#17f doing things to improve my child's health takes too much time	50	44	0	2	4	94

Total Score Mean 13.40(4.785)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-11

Summary of Each Item of the Questionnaire (Pretest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	6	8	6	42	38	80
Q#18b always follow doctors orders	2	2	6	20	70	90
Q#18c treatment child gets beneficial *	0	6	0	22	72	94
Q#18d do things to improve child's health	0	4	2	26	68	94
Q#18e give my child vitamins	18	18	16	22	26	48
Q#18f look for new info about lead	4	18	12	36	30	66

Total Score Mean 24.60 (4.106)

Cronbach Alpha .7687

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-12

Summary of Each Item of the Questionnaire (Posttest)

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 50

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	2	6	4	50	38	88
Q#18b always follow doctors orders	0	0	4	26	70	96
Q#18c treat child gets is beneficial	0	4	0	34	62	96
Q#18d do things to improve child's health	0	2	2	36	60	96
Q#18e give my child vitamins **	16	16	16	32	20	52
Q#18f look for new info about lead	0	6	4	54	36	92

Total Score Mean 25.34 (3.041)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-13

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Seriousness	SD	D	U	A	SA	%SA
Q#14a lead poisoning a serious health threat to my child	4	8	12	4	72	76
Q#14b thinking about lead poisoning scares me	0	4	4	32	60	92
Q#14c lead poisoning is hopeless disease	28	24	24	20	4	24
Q#14d worried about child' blood lead level	8	16	8	36	32	68
Q#14e afraid when I think about childhood lead poisoning	0	8	12	48	32	80
Q#14f problems from lead poisoning could last a long time	0	20	16	36	28	64

Total Score Mean 22.52 (4.283)

** p < .05 * p < .10 by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-14

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Seriousness	SD	D	U	A	SA	%SA
Q#14a lead poisoning a serious health threat to my child	4	8	4	20	64	84
Q#14b thinking about lead poisoning scares me	0	12	0	24	64	88
Q#14c lead poisoning is hopeless disease	32	36	12	16	4	20
Q#14d worried about child' blood lead level	0	16	8	40	36	76
Q#14e afraid when I think about childhood lead poisoning	0	8	0	52	40	92
Q#14f problems from lead poisoning could last a long time	0	12	12	36	40	76

Total Score Mean 23.20 (3.403)

Table E-15

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	%D
Q#15a child's chances of getting lead poisoning are great	12	28	28	24	8	40
Q#15b child's health makes it likely that they will get lead poisoned	20	48	16	8	8	68
Q#15c child's chances of getting lead poisoned are great	24	36	24	4	12	60
Q#15d good chance my child will get lead poisoned	20	40	28	4	8	60
Q#15e I worry a lot about my child getting lead poisoned	8	44	8	24	16	52
Q#15f within a year, my child will be lead poisoned	20	44	28	4	4	64

Total Score Mean 15.32 (4.939)

** p < .05 * p < .10 by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-16

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A= Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	%SA
Q#15a child's chances of getting lead poisoning are great	8	36	16	32	8	44
Q#15b child's health makes it likely that they will get lead poisoned	16	44	16	16	8	60
Q#15c child's chances of getting lead poisoned are great	16	36	16	20	12	52
Q#15d good chance my child will get lead poisoned	12	40	24	12	12	52
Q#15e I worry a lot about my child getting lead poisoned	8	36	8	28	20	44
Q#15f within a year, my child will be lead poisoned	12	44	28	12	4	56

Total Score Mean 16.68 (5.383)

Table E-17

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	%SA
Q#16a things to reduce child's chances of lead poisoning	0	12	4	36	48	84
Q#16b lot to gain by having lead level checked	4	4	0	20	72	92
Q#16c improving my child's health makes me feel good about myself	4	2	0	20	76	96
Q#16d family praises me when I do things to improve child's health	4	0	4	20	54	74
Q#16e friends praise me when I do things to improve child's health	0	8	4	36	48	84

Total Score Mean 21.88 (3.982)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-18

Summary of Posttest Responses for Each Item of the Questionnaire for Participants Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	%SA
Q#16a things to reduce child's chances of lead poisoning	0	0	4	40	56	96
Q#16b lot to gain by having lead level checked	0	4	0	20	76	96
Q#16c improving my child's health makes me feel good about myself	0	0	0	32	68	100
Q#16d family praises me when I do things to improve child's health	0	4	4	20	72	92
Q#16e friends praise me when I do things to improve child's health	0	4	4	44	48	92

Total Score Mean 22.84 (2.444)

Table E-19

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	%D
Q#17a don't have enough money to do things to improve my child's health	44	36	12	0	8	80
Q#17b don't have a way to take my child for medical checkups	36	44	8	4	8	80
Q#17c concerned that blood lead test is painful for my child	16	28	24	20	12	44
Q#17d have to change my schedule to take my child to the doctor	20	36	8	16	20	56
Q#17e trying to improve my child's health is too hard	48	36	8	4	4	84
Q#17f doing things to improve my child's health takes too much time	56	32	4	0	8	88

Total Score Mean 11.40 (4.473)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-20

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	%D
Q#17a don't have enough money to do things to improve my child's health	36	48	8	0	8	84
Q#17b don't have a way to take my child for medical checkups	28	52	8	4	8	80
Q#17c concerned that blood lead test is painful for my child	16	36	16	20	12	52
Q#17d have to change my schedule to take my child to the doctor	20	32	4	24	20	52
Q#17e trying to improve my child's health is too hard	36	56	0	4	4	92
Q#17f doing things to improve my child's health takes too much time	44	48	0	0	8	92

Total Score Mean 13.40 (5.156)

Table E-21

Summary of Pretest Responses for Each Item of the Questionnaire for Participants Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	4	12	0	44	40	84
Q#18b always follow doctors orders	0	4	4	16	76	92
Q#18c treat child gets is beneficial	0	8	0	32	60	92
Q#18d do things to improve child's health	0	4	0	28	68	96
Q#18e give my child vitamins	20	12	12	20	36	56
Q#18f look for new info about lead	4	16	12	28	40	68

Total Score Mean 24.96 (4.514)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-22

Summary of Posttest Responses for Each Item of the Questionnaire for Participants Receiving Personal Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	4	4	0	56	36	92
Q#18b always follow doctors orders	0	0	4	20	76	96
Q#18c treat child gets is beneficial	0	4	0	44	52	96
Q#18d do things to improve child's health	0	0	0	40	60	100
Q#18e give my child vitamins	8	16	8	40	28	68
Q#18f look for new info about lead	0	4	4	64	28	92

Total Score Mean 25.72 (3.143)

Table E-23

Summary of Pretest Responses for Each Item of the Questionnaire for Participants Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Seriousness	SD	D	U	A	SA	% SA
Q#14a lead poisoning a serious health threat to my child	0	8	8	36	48	84
Q#14b thinking about lead poisoning scares me	0	0	4	48	48	96
Q#14c lead poisoning is hopeless disease	24	36	20	12	8	20
Q#14d worried about child' blood lead level	0	12	0	52	36	88
Q#14e afraid when I think about childhood lead poisoning	4	0	0	52	44	96
Q#14f problems from lead poisoning could last a long time	0	8	4	44	44	88

Total Score Mean 23.80 (3.122)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-24

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Received Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Seriousness	SD	D	U	A	SA	%SA
Q#14a lead poisoning a serious health threat to my child	0	8	0	40	52	92
Q#14b thinking about lead poisoning scares me	0	0	0	36	64	100
Q#14c lead poisoning is hopeless disease	20	48	8	24	0	24
Q#14d worried about child' blood lead level	0	8	4	40	48	88
Q#14e afraid when I think about childhood lead poisoning	0	0	4	48	48	96
Q#14f problems from lead poisoning could last a long time	0	4	0	32	64	96

Total Score Mean 24.64 (2.841)

Table E-25

Summary of Pretest Responses for Each Item of the Questionnaire for Participants Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	%D
Q#15a child's chances of getting lead poisoning are great	0	36	24	36	4	36
Q#15b child's health makes it likely that they will get lead poisoned	4	48	32	12	4	52
Q#15c child's chances of getting lead poisoned are great	0	40	28	28	4	40
Q#15d good chance my child will get lead poisoned	4	32	28	32	4	36
Q#15e I worry a lot about my child getting lead poisoned	0	28	12	44	16	28
Q#15f within a year, my child will be lead poisoned	0	56	20	20	4	56

Total Score Mean 17.88 (4.576)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-26

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Susceptibility	SD	D	U	A	SA	%D
Q#15a child's chances of getting lead poisoning are great	4	36	20	36	4	40
Q#15b child's health makes it likely that they will get lead poisoned	8	52	28	12	0	60
Q#15c child's chances of getting lead poisoned are great	8	32	20	32	8	40
Q#15d good chance my child will get lead poisoned	12	28	16	36	8	40
Q#15e I worry a lot about my child getting lead poisoned	4	20	4	48	24	24
Q#15f within a year, my child will be lead poisoned	12	40	20	20	8	52

Total Score Mean 17.84 (5.437)

Table E-27

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	%SA
Q#16a things to reduce child's chances of lead poisoning	0	8	8	44	40	84
Q#16b lot to gain by having lead level checked	0	4	0	28	68	96
Q#16c improving my child's health makes me feel good about myself	0	8	4	12	76	88
Q#16d family praises me when I do things to improve child's health	0	0	20	32	48	80
Q#16e friends praise me when I do things to improve child's health	0	4	20	40	36	76

Total Score Man 21.68 (2.911)

** p < .05 * p < .10 by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-28

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Benefits	SD	D	U	A	SA	%SA
Q#16a things to reduce child's chances of lead poisoning	0	4	8	40	48	88
Q#16b lot to gain by having lead level checked	0	0	0	36	64	100
Q#16c improving my child's health makes me feel good about myself	0	4	4	12	80	92
Q#16d family praises me when I do things to improve child's health	0	0	12	44	44	88
Q#16e friends praise me when I do things to improve child's health	0	0	12	40	48	88

Total Score Mean 22.32 (2.445)

Table E-29

Summary of Pretest Responses for Each Item of the Questionnaire for Participants Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	%D
Q#17a don't have enough money to do things to improve my child's health	16	52	8	16	8	68
Q#17b don't have a way to take my child for medical checkups	28	48	4	20	0	76
Q#17c concerned that blood lead test is painful for my child	12	32	20	20	16	44
Q#17d have to change my schedule to take my child to the doctor	20	32	12	16	20	52
Q#17e trying to improve my child's health is too hard	36	32	8	16	8	58
Q#17f doing things to improve my child's health takes too much time	52	36	0	8	4	88

Total Score Mean 12.72 (4.179)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-30

Summary of Posttest Responses for Each Item of the Questionnaire for Participants Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Barriers	SD	D	U	A	SA	%D
Q#17a don't have enough money to do things to improve my child's health	20	48	4	24	4	68
Q#17b don't have a way to take my child for medical checkups	32	48	4	16	0	80
Q#17c concerned that blood lead test is painful for my child	8	48	16	20	8	56
Q#17d have to change my schedule to take my child to the doctor	24	40	4	16	16	64
Q#17e trying to improve my child's health is too hard	40	36	4	16	4	76
Q#17f doing things to improve my child's health takes too much time	56	40	0	4	0	96

Total Score Mean 13.4 (4.491)

Table E-31

Summary of Pretest Responses for Each Item of the Questionnaire for Participants

Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	8	4	12	40	36	76
Q#18b always follow doctors orders	4	0	8	24	64	88
Q#18c treat child gets is beneficial	0	4	0	12	84	96
Q#18d do things to improve child's health	0	4	4	24	68	92
Q#18e give my child vitamins	16	24	20	24	16	40
Q#18f look for new info about lead	4	20	12	44	20	64

Total Score Mean 24.24 (3.711)

** $p < .05$ * $p < .10$ by the Mann-Whitney U-Test of Significant difference between personal and video group

Table E-32

Summary of Posttest Responses for Each Item of the Questionnaire for Participants

Receiving Video Instruction

SD = Strongly Disagree D = Disagree U = Undecided A = Agree

SA = Strongly Agree

N = 25

Question Number and Item	Percentage Answering					
Motivation	SD	D	U	A	SA	%SA
Q#18a child eats well-balanced diet	0	8	8	44	40	84
Q#18b always follow doctors orders	0	0	4	32	64	96
Q#18c treat child gets is beneficial	0	4	0	24	72	96
Q#18d do things to improve child's health	0	4	4	32	60	92
Q#18e give my child vitamins	24	16	24	24	12	36
Q#18f look for new info about lead	0	8	4	44	44	88

Total Score Mean 24.96 (2.951)

Table E-33

Summary of Pretest Compliance Scores

N = 50

Question Number and Item	Percentage Answering Yes		
	All	Personal	Video
Q#19 dust with damp cloth and detergent	56	56	56
Q#21 wash child's toys before playing with them	40	96	100
Q#22 wash child's hands before eating	98	44	36
Compliant at pretest	22	24	20

Table E-34

Summary of Posttest Compliance Scores

N = 50

Question Number and Item	Percentage Answering Yes		
	All	Personal	Video
Q#19 dust with damp cloth and detergent	94	96	92
Q#21 wash child's toys before playing with them	100	100	100
Q#22 wash child's hands before eating	84	80	88
Compliant at posttest	84	80	88

Vita

Sylvia Elaine Johnson was born on April 2, 1963 in Elizabethtown, North Carolina, the daughter of the late Annie K. Johnson and Herbert Johnson. She graduated from Tar Heel High School, Tar Heel, North Carolina in 1980. She received the Bachelor of Arts degree from Fayetteville State University in 1984. Following, she worked as a Research Associate at Fayetteville State University until 1989. In 1989 she entered the Medical College of Virginia, Virginia Commonwealth University. In 1991, she received the Master of Science degree in Biomedical Engineering/Industrial Hygiene. Following, she did post-graduate studies at the University of Louisville. In 1992, she entered Old Dominion University's doctoral program in Urban Services-Health Services.