

THE INFLUENCE OF BEHAVIORAL CUES ON
IMMUNIZATION PRACTICES OF ELDERS

by

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A DISSERTATION

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ABSTRACT OF DISSERTATION
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A quasi-experimental intervention study was designed to compare the influence of behavioral cues on immunization practices of elders. Elders also were surveyed to determine immunization practices related to influenza and pneumonia and to ascertain reasons for underimmunization among this age group. The Neuman Systems Model and the Health Belief Model were used as conceptual frameworks to guide the study. Data were collected utilizing a Demographic Survey (DS) and an Immunization Survey (IS). The study population was 1,047 elders who were patients in rural health clinics in medically underserved communities in northern Mississippi where nurse practitioners (NPs) were the only primary care providers. The final sample consisted of 393 elders.

The subjects were divided into 4 groups, which included 1 control group (Group 1) and 3 treatment groups (Groups 2, 3, and 4). Subjects in Group 2 received a postcard reminder as a cue to obtain inoculations. Elders in Group 3 did not receive a postcard reminder but did

obtain care from NPs who received immunization fact sheets as a cue to increase awareness about underimmunization consequences for elders. Subjects in Group 4 received both a postcard reminder and care from NPs who were exposed to the fact sheets.

Descriptive statistics were used to analyze the DS and the IS. Additionally, for each group of elders, it was determined how many subjects received influenza, pneumonia, or both immunizations during the 3 months of data collection of October, November, and December, and a score was given to each group. A comparison of group mean scores were made among the 4 groups utilizing an analysis of variance (ANOVA), the Tukey, and the Least Significant Difference (LSD) procedure.

Data analysis revealed that, while the majority of the subjects ($n = 289, 73.5\%$) had received an influenza inoculation last year, only 38.3% of the subjects had ever received an immunization to prevent pneumonia. Data analysis also indicated that the group of elders who received both a postcard reminder and care from an NP exposed to immunization fact sheets had significantly higher immunization rates than all other groups.

Additional data analysis of elders who had not received influenza immunization in the previous year had never received pneumonia inoculation, or both indicated that among these elders receiving care from NPs who were exposed to fact sheet cues alone or in combination with

postcard reminders immunizations significantly increased. This mean group indicated the reason for not obtaining the influenza, pneumonia, or both immunizations in the past was "I did not think I needed it."

A conclusion from this study was that the practice of sending postcards to elders as a reminder to receive immunizations may be an effective strategy for NPs to pursue. Additionally, fact sheets for diseases preventable with inoculations should be developed and displayed as reminders to NPs working in primary care clinics.

Abstract Approved by: Committee Chairman

Program Director

Date 9/27/96 Dean of Graduate School

DEDICATION

I would like to dedicate this dissertation to family members who have encouraged me throughout this endeavor. Loving gratitude is expressed to my husband, Larry, and my two sons, Scott and Michael, for their sacrifices, love, and support.

Special thanks and dedication are given to my father, Herbert Ambroz, and in memory of my mother, Marjorie Ambroz, who early in life instilled in me a desire to learn and attain an education. You have been an inspiration to me.

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TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	iii
DEDICATION	vi
ACKNOWLEDGEMENTS	vii
LIST OF TABLES	x
 CHAPTER	
I Introduction	1
Purpose	5
Research Questions	6
Hypotheses	6
Definitions of Terms	8
Conceptual Framework	9
Assumptions	12
Limitations	13
Significance of the Study	13
II Review of the Literature	16
Studies Related to Influenza	
Immunization	17
Studies Related to Pneumococcal	
Immunization	23
Studies Related to Disease	
Prevention	27
Immunization Studies Utilizing the	
Health Belief Model	32
Elder Studies Utilizing Neuman's	
Systems Model	35
Summary	39
III Methodology	41
Design of the Study	41
Setting and Subjects	41
Instrumentation	43
Pilot Study	44
Procedure for Data Collection	47
Data Analyses	51
Summary	52

TABLE OF CONTENTS (Continued)

	<u>Page</u>
CHAPTER	
IV Findings	54
Sample Characteristics	54
Demographic Data	56
Findings Related to Research Questions	59
Research Question 1	59
Research Question 2	60
Findings Related to Research Hypotheses	63
Research Hypothesis 1	63
Research Hypothesis 2	65
Research Hypothesis 3	66
Research Hypothesis 4	67
Research Hypothesis 5	67
Research Hypothesis 6	68
Research Hypothesis 7	69
Additional Data Analysis	69
Summary of Findings	71
V Discussion, Conclusions, Implications, and Recommendations	74
Discussion of Findings	74
Demographic Characteristics	75
Research Questions	78
Research Hypotheses	80
Additional Findings	81
Conceptual Framework	83
Conclusions	84
Implications	85
Recommendations for Future Research	87
REFERENCES	88
APPENDICES	
A Immunization Survey	94
B Postcard Reminder	96
C Fact Sheets	98
D Demographic Survey	101
E IRB Approval Form	103
F Agency Consent Form	105
G Consent Form	107

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Summary of Sample Characteristics for Age by Frequency and Percentage	56
2	Summary of Sample Characteristics for Education by Frequency and Percentage	57
3	Summary of Sample Characteristics of Health Rating by Frequency and Percentage	59
4	Influenza Immunization Practices of Elders by Frequency and Percentage	60
5	Pneumonia Immunization Practices of Elders by Frequency and Percentage	61
6	Reasons Selected by Elders for Not Receiving Flu Shots by Frequency and Percentage	62
7	Reasons Selected by Elders for Not Receiving Pneumonia Shot by Frequency and Percentage	63
8	One-Way Analysis of Variance Comparing Mean Scores Between Groups of Elders Receiving Three Different Interventions and Those Receiving No Interventions	65
9	One-Way Analysis of Variance Comparing Mean Scores of Elders Who Had Not Previously Following CDC Immunization Guidelines Between the Control Group and the Three Intervention Groups	71

CHAPTER I

Introduction

The most rapidly growing segment of the population today in the United States is elders or those individuals aged 65 years and over (Ebersole & Hess, 1990). It is estimated that elders, who comprised 12.3% of the population in 1990, will make up approximately 30% of the population by the year 2030 (Berry, 1991). Additionally, by that same date, nearly 65 million individuals will be elders (McLean, 1988).

These individuals are particularly vulnerable to disease due to decreased immunity that is associated with a less effective immune response as the body ages (Bentley, 1992; "The Efficacy of the Pneumococcal Vaccine," 1992). Additionally, 85% of all elders aged 65 years and older will develop one or more chronic disease conditions (Lewis, 1984). Individuals with underlying chronic diseases are more susceptible to infectious disease (Bentley).

Significant levels of elder illness and death are associated with diseases that are infectious and preventable through immunization (Lichtenhan, Kellerman, & Richards, 1992; Marchiondo, 1991). Two diseases to which elders are especially vulnerable are influenza and pneumonia. Collectively, these two preventable infections

account for approximately 60,000 deaths annually among older adults (Centers for Disease Control [CDC], 1992). The impact of influenza and pneumonia on elders is profound as these diseases are a major cause of hospitalization and death among this age group (Herwaldt, 1993; Walhout, 1986; Ward, 1992).

Influenza effects elders at a rate of four times that of adults under 40 years of age (Gravenstein, Miller, & Drinka, 1992) and is associated with illnesses that account for 10,000 to 40,000 deaths per year in the United States, depending upon the severity of the epidemic in that particular year (CDC, 1990; Gorse, Belshe, & Munn, 1991; Herwaldt, 1993; "Nosocomial Flu Outbreaks," 1989; Steele, 1990; Ward, 1992). Although elders comprise only 13% of the population, individuals over the age of 65 years account for approximately 50% of all influenza related hospitalizations (Bentley, 1992) and approximately 85% of all deaths caused by influenza (Nicholson, 1990; Taylor et al., 1992).

Cost estimates of the economic impact of an influenza epidemic range from \$3 to \$12 billion annually (Herwaldt, 1993; Holt, 1992). Also, the incidence of influenza, hospitalization, and death rates could be reduced by approximately 45%, 65%, and 75%, respectively, if all elders were immunized against this disease (Holt; Patriarca, Arden, Koplan, & Goodman, 1987). According to Bentley (1992), vaccinating all elders against influenza

would incur a net cost of only \$13 per year of life gained by these individuals.

Pneumonia also is a debilitating disease that affects individuals more frequently as they age (Gable et al., 1990). There is a two-fold increase of pneumonia incidence among those individuals over the age of 65 years, as compared with persons under the age of 65. The overall incidence rate for pneumonia in elders is 125 to 245 cases per 100,000 individuals annually (Bentley, 1992). This disease accounts for 40,000 deaths per year and continues to be the fifth leading cause of death in the United States (Fedson, 1990; Gable et al.; Holt, 1992; Stein, 1993).

Not only has pneumonia been costly in terms of human life but also has resulted in an average expense of \$2,688 for each pneumonia related hospital admission. Projected costs of treating individuals who contract pneumonia are 3.6 times the costs of pneumonia vaccination for all elders (Gable et al., 1990). The cost of immunizing elders against pneumonia has been estimated to be \$9.60 per individual. Furthermore, for every pneumonia related hospital admission, 280 patients could be immunized (Fedson, Harward, Reid, & Kaiser, 1990).

In spite of the profound consequences of influenza and pneumonia, only an estimated 10% to 20% of all elders have ever been vaccinated against pneumonia (Besdine, 1992; Catalana, 1992; Eickhoff, Strikas, & Williams, 1992; Holt, 1992; "Pneumonococcal Vaccine," 1988; Tobacman, 1992). Also, although influenza is preventable through

inoculation, only 20% to 30% of all elders are immunized against this disease each year (Fedson et al., 1990; Marchiondo, 1991). In spite of the fact that both pneumonia and influenza immunizations have been reimbursable by Medicare since 1981 and 1990, respectively, there has been no significant increase in inoculation rates for elders for these diseases (Bentley, 1992; Fedson, 1990; Holt, 1992).

Several reasons have been proffered as explanations for low immunization rates among older adults. Various authors have attributed low inoculation rates to inadequate awareness among elders and health care providers alike regarding health problems caused by the underimmunization against influenza and pneumonia (Fedson, 1989, 1994; Haber, 1993; Holt, 1992). Other authors have stated that many older individuals have no knowledge of the severity of vaccine preventable diseases, nor are they aware of the safety and effectiveness of immunizations against influenza or pneumococcal (Christian, 1992; Fedson, 1994). Elders also may be unaware of the fact that Medicare will pay for influenza and pneumococcal immunizations (Bentley, 1992).

Underimmunization also may have resulted because immunity data provided to health care providers regarding adult vaccines have been scarce (Besdine, 1992; "Pneumococcal Vaccine," 1988). It has been postulated that health care providers may fail to utilize opportunities to immunize adults during clinic, office, or hospital visits (Fedson, 1994; Fedson et al., 1990). Further, there are no

statutory mandates for adult immunizations, as there are for pediatric inoculations that are required for entry to school (Fedson, 1994).

Anecdotal references to the problem of underimmunization of elders can be found in the literature but very few studies have been conducted regarding this problem. A paucity of research has focused on determinants for underimmunization or improving immunization rates. Additionally, the National Vaccine Advisory Committee (NVAC) has recommended that programs be implemented to improve the adult immunization practices of health care providers and that research regarding such programs be conducted (Fedson, 1994; Kligman, 1992). However, few nursing studies related to immunizations and elders were found in a review of the literature published over a 13-year period.

Purpose

The severe consequences of influenza and pneumonia in elders have been documented in the literature, as has the underimmunization of elders. However, relatively little research has been conducted concerning immunizations and elders. The purpose of this research, therefore, was to determine the immunization practices of elders and to ascertain reasons for underimmunization among this age group. Additionally, this research attempted to determine the effect of utilizing behavioral cues to improve immunization rates among elders.

Research Questions

This study related to immunization practices of elders addressed the following research questions.

1. What are the immunization practices of elders?
2. What are the reasons for the immunization practices of elders?

Hypotheses

This study postulated the following research hypotheses.

1. There will be no differences between immunization practices of elders who: (a) are in the control group and receive neither postcard reminders as behavioral cues to action nor obtain care from nurse practitioners (NPs) who were exposed to fact sheets as behavioral cues to action, (b) receive a postcard reminder, (c) obtain health care from NPs who were exposed to immunization fact sheets, and (d) receive both a postcard reminder and also obtain health care from NPs who were exposed to immunization fact sheets.

2. There will be no differences between immunization practices of elders who receive a postcard reminder and elders in the control group who receive neither postcard reminders nor obtain care from NPs who were exposed to immunization fact sheets.

3. There will be no differences between immunization practices of elders who obtain health care from NPs who were exposed to immunization fact sheets and elders in the control group who receive neither postcard reminders nor

obtain care from NPs who were exposed to immunization fact sheets.

4. There will be no differences between immunization practices of elders who receive a postcard reminder as a cue to action and obtain care from NPs who were exposed to immunization fact sheets and elders in the control group who receive neither postcard reminders nor obtain care from NPs who were exposed to immunization fact sheets.

5. There will be no differences between immunization practices of elders who receive postcard reminders and obtain care from NPs exposed to immunization fact sheets and elders who only receive postcard reminders but do not obtain care from NPs who were exposed to immunization fact sheets.

6. There will be no differences between immunization practices of elders who receive postcard reminders but do not obtain care from NPs who were exposed to immunization fact sheets and elders who only obtain care from NPs who were exposed to immunization fact sheets but do not receive postcard reminders.

7. There will be no differences between immunization practices of elders who receive postcard reminders and also obtain care from NPs who were exposed to immunization fact sheets and elders who do not receive postcard reminders but obtain care from NPs who were exposed to immunization fact sheets.

Definitions of Terms

For the purposes of this study, the following terms were defined.

Immunization Practices--Theoretical: strategies or behaviors related to inoculation against disease. Operational: immunization practices were defined by the responses to Questions 1 and 3 on a researcher-developed Immunization Survey (Appendix A), which addressed if and when immunizations for influenza and pneumonia were received.

Elders--Theoretical: an individual who is older (Webster's New Collegiate Dictionary, 1989). Operational: individuals, aged 65 years or older, who received health care during the time of data collection at three selected rural health clinics, were cognitively intact as determined by the absence of any diagnosis related to mental impairment such as senile dementia, Alzheimer's disease, or multi-infarct dementia, and were included in the study.

Reasons for Immunization Practices--Theoretical: explanations for behaviors related to inoculation against disease. Operational: explanations for immunization practices as reported by responses to Questions 2 and 4 on the Immunization Survey (Appendix A), which addressed reasons for receiving or not receiving immunizations in the past.

Behavioral Cue to Action--Theoretical: performance of a strategy that utilizes a prompt to spur an individual to complete an activity. Operational: two behavioral cues

that were utilized to improve immunization practices of elders. The first cue was a postcard reminder (Appendix B) sent to one half of the elders in each of the selected clinics (Clinics A, B, and C), indicating that it was time to schedule an appointment for needed influenza, pneumonia, or both immunizations. The second cue used was immunization fact sheets on influenza and pneumonia (Appendix C), plus a discussion about the fact sheets with NPs in Clinics B and C.

Nurse Practitioners--Theoretical: advanced practice nurses who are primary health care providers and have received education beyond that of the Registered Nurse. This education has prepared the advanced practice nurse to assess, diagnose, and manage simple acute and chronic primary conditions, as well as provide health promotion and disease prevention strategies, such as immunizations. Operational: NPs will include those advanced practice nurses who are the only primary health care providers at selected rural health clinics.

Conceptual Framework

Two models provided the conceptual framework for this study. Neuman's (1989) Systems Model and the Health Belief Model (HBM) (Leventhal & Cameron, 1987; Mullen, Hersey, & Iverson, 1987; Rosenstock, Strecher, & Becker, 1988; Salazar, 1991) provided the structural basis that guided this research in relation to the clinical problem of immunization practices of elders.

The Neuman (1989) Systems Model has been applied to various health promotion studies. Since the holistic approach of the model is consistent with supporting health life practices, it was well suited for primary prevention application in a variety of settings (Breckenridge, 1989; Gavan, Hastings-Tolsma, & Troyan, 1988).

Neuman's (1989) Systems Model is composed of four subconcepts of nursing: client, environment, health, and nursing. An open client/client system, in which all of the elements are in interaction, is described as having a continuous flow of input, process, output, and feedback. This client/client system is represented by an arrangement of concentric rings surrounding a basic structure with a constant energy exchange, moving toward or away from stability.

According to Neuman (1989, 1990), wellness and health are the degree of stability or the condition in which all parts are in harmony with the client/client system. The client interacts with both internal and external environmental stressors. The Neuman (1989) Systems Model identifies the flexible line of defense as a protector from stressors, such as diseases, and depicts it as an outer broken circle surrounding the normal line of defense. This flexible line of defense can be strengthened to prevent or reduce a possible stressor reaction. Neuman (1989) depicts prevention intervention as a means of strengthening the flexible lines of defense. Primary prevention is used when a risk is known but a reaction has not yet occurred.

Three concepts derived from Neuman's (1989) Systems Model were appropriate to this research: client, flexible line of defense, and primary prevention as intervention. Client, which may be an individual or group of individuals with a composite of common factors or innate characteristics, is the first concept (Neuman). The second concept, flexible line of defense, is a protector from stressors such as diseases. This flexible line of defense can be strengthened to prevent or reduce a possible stressor reaction. Application of this concept within this study was appropriate as elders' lines of defense may be weakened due to lowered immunity and chronic disease.

The third component from Neuman's (1989) Systems Model that was used is primary prevention as intervention. According to Neuman, prevention as intervention is a means of strengthening the flexible lines of defense. Primary prevention is used when a risk is known but a reaction has not yet occurred. This concept was appropriate for this study because immunizations are used to prevent influenza and pneumonia in elders who are at high risk to contract these diseases.

In addition to the Neuman (1989) Systems Model, the HBM (Leventhal & Cameron, 1987; Mullen et al., 1987; Rosenstock et al., 1988; Salazar, 1991) provided direction for this study. The HBM was developed in the 1950s by Hochbaum (Leventhal & Cameron; Mullen et al.) and was subsequently expanded by Kegeles, Leventhal, Rosenstock, and Becker in an effort to explain preventive behavior

(Rosenstock, 1974; Salazar, 1991). There are four dimensions to this model, which include: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Janz & Becker, 1984). According to this model, in order for individuals to take action to prevent or avoid a disease, they would need to believe that they were susceptible to it and that the disease would have a severe potential effect on some aspect of their lives (Rosenstock et al.; Salazar). The HBM further proposes the probability that a person will take action concerning a health condition is determined by two things, the perceived benefits of action weighed against the perceived barriers or costs (Clark et al., 1988; Mullen et al.). Increasing cues to action is one method to trigger a response in an individual to undertake a health related behavior (Salazar).

A selected concept from the HBM, increasing cues to action, is frequently associated with operationalizing the HBM and had significance for this study (Salazar, 1991). Increasing cues to action appears to be necessary for an individual to assume a health related prevention (Salazar). Increasing cues to action was utilized in the intervention phase of this study to improve immunization rates of elders, which is the health related prevention strategy under investigation.

Assumptions

The following assumptions have been made for this study: (a) elders accurately report reasons for being

immunized or not being immunized; (b) immunization practices in elders can be identified; (c) immunization rates, demographic data, and diagnoses in elders' patient records are accurate; (d) proper immunization practices increase flexible lines of defense; and (e) immunizations decrease incidence of pneumonia and influenza.

Limitations

The following limitations were identified for this study: (a) the findings of this study cannot be generalized to elders in other settings; (b) the Immunization Survey may not represent all reasons for underimmunization of elders; (c) uncontrollable extraneous cues to action for elders, such as mass media campaigns, may increase immunization rates; (d) impromptu interaction among subjects in various groups may affect results; (e) differences in practice styles among NPs may affect immunization rates; (f) flagging the charts to identify potential subjects may increase awareness among NPs and result in increased immunization rates; and (g) illiteracy of elders may prevent participation in a study that utilizes written consent forms and surveys.

Significance of the Study

Determination of the immunization practices of elders, reasons for underimmunization among this age group, and analysis of the effect of strategies utilizing behavioral cues to improve immunization rates among elders should have important implications for nursing. Particular areas of

significance include clinical practice, education, and research.

This study could benefit nursing practice in several ways. This research is needed to assess nursing interventions that could improve immunization practices of the vulnerable elderly population. Research of this nature should be helpful to NPs who have elders as clients in primary care practice settings. The findings from this study should provide valuable information for NPs and other health care providers concerning the reasons elders do or do not receive immunizations. This information could provide the basis for development of strategies to improve the immunization practices of elders. Additionally, if the interventions that were utilized in this research show a significant improvement in immunization rates of elders, replication of the study in additional locations and settings could improve elders' immunization practices.

The findings from this study also should be beneficial to the education of nurses. Schools of nursing might be able to utilize the results and recommendations to add content to curricula related to the importance of immunizations for elders. In graduate NP programs, where emphasis is placed on disease prevention, students could be taught the concept of increasing cues to action for elders as a means of improving immunization practices for this age group.

Anecdotal references to the problem of underimmunization of elders can be found in the literature,

but very few studies have been conducted regarding this issue. Because a paucity of nursing studies related to immunizations and elders was found in a review of the literature, this study could be used to expand the nursing knowledge base on this topic. Additionally, the framework used to support this study could be used as a guide for future studies related to immunizations and elders.

CHAPTER II

Review of the Literature

The severe consequences of influenza and pneumonia in elders have been documented in the literature, as has the problem of immunizations and elders. Anecdotal references to the problem of underimmunization of elders can be found in the literature, but very few studies have been conducted regarding this issue.

Computer searches of three national social science and health data bases that reviewed 650 journals from the period of 1982 to 1995 revealed an extremely limited amount of research in the area of immunizations for elders, determinants of the underimmunization against these diseases, and strategies for improving immunizations. Of the 783 immunization references cited in Cinahl, 3,583 references in Medline, and 15 references in Ageline, only 28 citations specifically addressed elders and immunizations with the majority of these anecdotal references. Furthermore, there was a paucity of nursing studies related to immunizations and elders found in the review of the literature.

Several areas of research were reviewed, based on relevance to the study under investigation. The areas reviewed included studies conducted on influenza and

pneumococcal immunization, as well as research related to preventive practices including immunizations. Additionally, immunization studies utilizing the HBM as a framework and elder studies utilizing Neuman's Systems Model were included.

Studies Related to Influenza Immunization

Several studies on influenza outbreaks in nursing home, hospital, and community settings were identified in a review of the literature. One study conducted by Carter, Renzullo, Helgerson, Martin, and Jekel (1990) proposed to determine the effectiveness of the influenza vaccine among institutionalized elders.

Outbreaks of influenza in three Connecticut nursing homes were investigated during the 1984-1985 influenza season. Residents of the three nursing homes were administered the recommended influenza vaccine in late October and early November. To determine cases of influenza illness, the investigators reviewed medical charts of all nursing home residents. Information about influenza illnesses that occurred from December through April were recorded. Additionally, data were collected concerning the resident's level of care, whether the influenza vaccination was received, treatment received, diagnostic studies conducted, and whether hospitalization was required. Paired serum specimens and throat swabs were obtained. Antibody titers were obtained from the ill individuals in addition to individuals in the nursing home who were not affected by the illness. Vaccine

effectiveness was based on calculations of the attack rate of the illness for immunized residents and those not immunized. Statistical analysis included descriptive statistics.

Findings from the Carter et al. (1990) study revealed that the immunization rates were 67% ($n = 144$), 35% ($n = 85$), and 69% ($n = 483$), respectively, for all three nursing homes. The risk of illness for immunized as compared to unimmunized residents was 1.8, 1.6, and 1.1 for each of the nursing homes. Results indicated that vaccinated residents had higher rates of influenza illness than did unvaccinated residents. Antibody titer levels suggested that immunized residents were not protected against influenza during the time of the third outbreak, which was 4 to 5 months after immunization. The researchers recommended that influenza immunization programs be implemented for nursing homes in November instead of October as previously recommended, as a result of this study.

Patriarca et al. (1987) conducted a study related to prevention and control of Type A influenza infections in nursing homes. The purpose of this study was to ascertain if immunization, chemoprophylaxis, or a combination of these two methods might be the most beneficial and cost-effective method of influenza control in a nursing home setting.

The study involved projected comparisons of four hypothetical groups of nursing home patients utilizing the two identified methods of influenza control. The

hypothetical cohort sample was 100 nursing home residents. The first group of residents received influenza immunization in the autumn with no chemoprophylaxis. The second group received influenza inoculation in the autumn and chemoprophylaxis for both immunized and unimmunized residents when an outbreak of the disease was identified. In the third group, only chemoprophylaxis was administered to all residents as soon as an influenza outbreak was identified. Residents in the fourth group received continuous chemoprophylaxis during the time when influenza was identified in the surrounding community, but no immunization program was conducted.

Patriarca et al. (1987) concluded that influenza control programs resulted in fewer illnesses and complications than projected. The incidences of influenza, hospitalization, and death projections were reduced by minimums of 55%, 60%, and 65%, respectively. The option in which the influenza vaccination was used without any adjunct therapy was projected to be the most cost effective but was associated with higher rates of morbidity and mortality. The combination of inoculation and chemoprophylaxis during an identified outbreak showed an improved outcome of decreased illness at a modest cost increase. Proposed continuous chemoprophylaxis demonstrated the fewest number of projected cases in the model but was estimated to be 6.5 to 10 times more expensive than the first two proposed options. The investigators concluded

that the use of influenza control programs in nursing homes would have beneficial cost-effective outcomes.

Taylor et al. (1992) conducted a study that evaluated influenza vaccine efficacy for patients living in a Maryland nursing home. The study included a description of an outbreak of influenza A, analysis of vaccine efficacy, and the predictive value of clinical case definitions of influenza. Influenza was defined as an illness in which an individual had a documented oral temperature of greater than 100 °F along with a cough or a four-fold risk of antibody titer to influenza A virus as identified by a complement fixation test. Paired serum for antibody testing was obtained from both well and ill residents, and throat swabs were obtained from acutely ill residents. Data were analyzed with chi square utilizing Cornfield's method or Fisher's exact test.

Findings indicated 47.7% of the residents were affected by the influenza outbreak. Twenty-five residents demonstrated a four-fold or greater increase in titer response to influenza A. The vaccine efficacy was determined to be -7.1%, which suggested that the immunization administered during the 1988-1989 outbreak, which was measured, in the study did not provide adequate protection against influenza A for the institutionalized elder. The researchers concluded that there is a need for rapid diagnosis of influenza. They further concluded that, if influenza was diagnosed within 24 to 48 hr, amantadine could be used to control the outbreak.

Review of the literature revealed two studies related to influenza immunization practices of elders in the community. A study by Leirer, Morrow, Pariente, and Doksum (1989) was conducted to determine if influenza immunization rates of elders could be improved through the use of voice mail. A convenience sample from elders who ate at a community lunch program ($N = 321$) was divided into four groups. One group received voice mail reminders of the time, place, and cost of the influenza immunizations and announcements at the lunch program ($n = 24$). The second group received no voice mail but received announcements at the lunch program ($n = 27$). A third group received voice mail messages but no lunch program announcements ($n = 68$), while the fourth group received no voice mail and no announcements ($n = 65$).

Results indicated that voice mail increased participation in an influenza immunization clinic for those receiving additional announcements at a lunch program ($X^2 = 5.51, p < .025$). Announcements at the lunch program increased participation only among those receiving voice mail also ($X^2 = 7.80, p < .01$). Announcements alone did increase immunizations but the increase was not statistically significant ($X^2 = 2.08, ns$). It was concluded that public announcements normally used to remind elders to receive influenza immunizations do not produce effective results. The investigators recommended further research should be conducted utilizing the use of voice

mail as a reminder for participation in immunizations for influenza.

Montano (1986) conducted a study related to predicting and understanding influenza immunization behavior in elders at risk for developing influenza. The Fishbein Reasoned Action Model and the Triandis Predictive Behavior Model were used as a framework for this study. The sample ($N = 439$) was obtained from patients at a Seattle Veterans Administration (VA) Medical Center clinic who were at high risk for developing complications from influenza.

An interview questionnaire was administered to each participant 4 months before the flu season to determine beliefs related to dimensions of the Fishbein and Triandis models. Specifically, behavioral intention about obtaining the immunization and attitude toward and perceived consequences of receiving the immunization were determined. Additionally, respondents were queried regarding their immunization habits of the past and facilitating conditions. Postcard reminders were sent to all respondents, which indicated availability of the flu shot at the clinic. Participants were surveyed at the end of the immunization season to determine if they had obtained the inoculation.

Descriptive statistics and correlations were used to analyze the data. Findings indicated that 67% of the individuals intended to obtain an influenza immunization, and 68% actually received the immunization. Of the number who received the immunization, 17% indicated that they did

not intend to be immunized. Behavioral intention was the component of the Fishbein model that was most highly correlated with the immunization behavior ($r = 0.69$, $p < 0.01$). A multiple correlation of the Triandis model revealed that this framework could account for 64% of the variance in intention and behavior. Intention and habit were both significantly correlated with behavior ($r = 0.80$, $p < 0.01$).

The investigator concluded that the postcard reminders spurred action on the part of the participants, in that 17% of the sample had indicated that they did not intend to be immunized but later were inoculated. Montano (1986) also concluded that the Triandis model was superior to the Fishbein model in predicting health behavior.

Studies Related to Pneumococcal Immunization

A small number of studies were found in a review of the literature related to pneumococcal vaccination of elders. A study conducted by Tobacman (1992) was concerned with an intervention strategy to increase pneumococcal immunization. This study utilized an 8-month prospective and retrospective survey to monitor the use of pneumococcal immunization in the ambulatory clinic. Additionally, the researcher attempted to ascertain the effect of a quality assessment monitor on immunization rates. The population consisted of 1,060 adult patients who presented to the clinic during the study interval. A brief pneumococcal immunization written monitor used to assess immunization

status was attached to each patient chart. The monitor was completed by resident physicians who staffed the clinic.

Results indicated that, during the period when the monitor was in use, pneumococcal immunization increased 37% in the clinic. Furthermore, pneumococcal immunization more than doubled in all clinics, after implementation of the monitor. Additionally, when the monitor was purposely discontinued during a 2-month period in the study, the immunization rate returned to baseline levels.

The researcher concluded that the monitor not only served as an assessment of immunization status but also served as an impetus to increase immunization rates. The investigator also felt that this was confirmed by the fact that, when the monitor was not in place, immunization rates dropped. Tobacman (1992) recommended further studies to determine if immunizations are underutilized because health care providers fail to recognize appropriate indications. It was further recommended that strategies to increase immunizations need to be determined.

Fedson et al. (1990) conducted a descriptive study that explored the usefulness of a hospital-based pneumococcal immunization program. A retrospective survey of hospital discharge summaries from 23 counties in Virginia was made to identify patients with a diagnosis of pneumonia. Hospital records of those with this diagnosis were audited for the previous 5 years to determine the number of hospitalizations among this group of individuals.

The researchers identified 1,633 individuals aged 65 years or older who were discharged from hospitals in the selected area of Virginia. Findings indicated that 6% to 9% of the patients had been admitted or readmitted for pneumonia during this 5-year period at an average cost of \$2,688 for each admission, while the estimated costs of immunizations would have been \$9.60 per individual. Further, Fedson et al. (1990) concluded that immunizations would have prevented pneumonia hospitalization admissions with a substantial cost savings.

Another study found in the review of literature evaluated the efficacy and associated cost savings of pneumococcal vaccine administration to elders (Gable et al., 1990). A retrospective design was used to compare vaccinated individuals ($N = 762$) over the age of 50 years with randomly selected unvaccinated age-sex matched individuals ($N = 1,161$). Subjects were determined from insurance claim forms filed in Minnesota through Blue Cross/Blue Shield during a 2-year period. For the immunized individuals, medical and pharmaceutical forms were analyzed for the year prior to immunization and the year after immunization. This same time period was used to analyze records for the unimmunized individuals.

Results indicated that, in the vaccinated group, there were 55 reported cases of pneumonia in the year preceding immunization, as compared to 17 cases found during the year after immunization. The Mantel-Haenszel chi square statistic test was utilized to analyze the data for

incidence rate ratio, which compared the rate of pneumonia in the postvaccination period to the prevaccination period. An incidence rate ratio of less than 1 indicated reduced risk for developing pneumonia. The incidence rate ratio of contracting pneumonia in the postimmunization period versus the preimmunization period was calculated to be 0.31. Therefore, Gable et al. (1990) determined that the risk of contracting pneumonia after immunization was less than one third the risk prior to immunization. This finding demonstrated a vaccinated efficacy of 69%.

When looking at the findings for the comparison group, Gable et al. (1990) determined that there were 7 cases of pneumonia during the first year period of the study and 19 cases reported during the second year of the study. The incidence rate ratio for this group was calculated to be 2.7, which indicated a higher risk for pneumonia during the second year for the unvaccinated individuals.

Costs of treatment of the individuals who contracted pneumonia also were compared with the costs of vaccination in this study. The average cost of administering a pneumococcal immunization during a routine office visit was \$18.53. The costs of treating all pneumonia cases were subtracted from the projected costs of treating 1,000 at risk unimmunized individuals. There was a cost savings of \$141,098 associated with immunizing this group of individuals or \$141 per individual savings. The researchers concluded that widespread immunization programs for persons over the age of 50 years are cost effective.

Studies Related to Disease Prevention

Several studies related to preventive practices were found in the review of literature. These studies related to general disease prevention strategies and acceptance of attitudes toward immunizations by health care providers.

One study focused on prevention strategies, including immunizations, used by family physicians in the community (Haber, 1993). This study used a biased convenience sample ($N = 15$) of primary care physicians who were interested in preventive medicine. A series of 1-hr semistructured interviews was conducted with each of the participants. The sessions concentrated on various aspects of disease prevention: nutrition, diet, exercise, stress, alcohol abuse, smoking addiction, medical screenings, and immunizations. The physicians were specifically asked how they attempted to encourage patients to change health behaviors, how successful they were in doing this, and how older patients compared with younger patients.

The data were collected on audio tapes and were transcribed at a later date. Content analysis of the data for recurrent themes revealed that the interviewed physicians endorsed using multiple modalities of patient education. However, only two of the respondents could provide specific examples. In general, most of the physicians indicated a preference for a single approach to patient education, without tailoring the approach to the individual patient. Many of the interviewed physicians spoke about the potential for sharing the responsibility of

teaching prevention to patients with other health care providers, such as NPs. Overall, the physicians were negative about the prospect of changing health behaviors of older patients. Additional analysis revealed that only two of the physicians felt that their preventive medicine education was adequate. The researcher recommended that more studies address how to prepare clinicians for preventive medicine and what needs to be done in the clinic to implement prevention.

Several studies were found in the literature on influenza vaccine acceptance among health care workers. None of these studies targeted health care providers who worked exclusively with elder patients, because only employees of large community hospitals were surveyed.

One study conducted by Christian (1992) evaluated the acceptance of voluntary influenza and hepatitis B immunizations among health care workers. A survey of all employees ($N = 379$) in a medical center in Spokane, Washington was performed. A questionnaire was utilized to collect the data. A return rate of 63.3% was obtained. Descriptive statistics were used to analyze the data.

Results from this study indicated various reasons for not taking the influenza immunization. The most common reason given was the desire to avoid medications whenever possible (47%), and the second most commonly cited reason was fear of getting influenza from the vaccine (45%). Additionally, 37% of the respondents cited fear of adverse

reactions, such as Guillian-Barre' syndrome, as a reason for unacceptance of the influenza vaccine.

Recommendations as a result of the Christian (1992) study included dissemination of the findings of the study to all employees through the employee newsletter. The investigator also recommended that any misinformation should be addressed in a mandatory education program, as well as during formal and informal communication systems, such as staff meetings or memos. It was further recommended that national guidelines for health care workers' acceptance of influenza vaccine be publicized. Additionally, the researcher suggested that the \$2.00 administration fee for the influenza immunization should be waived and that the vaccine should be administered in the employees' departments.

In 1993, Watanakunakorn, Ellis, and Gemmel conducted a study on the attitudes of health care personnel regarding influenza immunization. The stated objectives of the study were to survey the attitudes regarding influenza immunization of health care personnel in a hospital setting.

The method of data collection consisted of administering a questionnaire to all hospital employees in a 650-bed community teaching hospital ($N = 3,501$). A return rate of 34.3% was obtained ($N = 1,203$). Statistical analysis to ascertain differences between immunized and nonimmunized participants utilized Pearson's chi square for

nominal data and analysis of variance (ANOVA) for continuous data.

The findings from this study revealed that 31% of the respondents had received the influenza immunization. Additionally, 84.4% of the participants who received the immunization during the year of the study had received the vaccine during the previous 2 years, as compared to 8.7% of the respondents who did not receive the vaccine during the year of the study. Results also indicated that full time employees who were older were more likely to be immunized. Additionally, proportionately more respondents who received the immunization had attended an in-service related to influenza.

Reasons included for not receiving the influenza inoculation most frequently included fear of having side effects, a dislike for injections, and past experiences of side effects from influenza immunizations. Watanakunakorn et al. (1993) concluded that educational campaigns and more accessible influenza immunization administration could result in higher acceptance of the immunization. The researchers also concluded that efforts should be made to convince health care personnel who never receive the inoculation to do so, as findings indicated that, once personnel receive influenza immunization, they are likely to continue to be immunized in the future.

Weingarten, Riedinger, Bolton, Miles, and Ault (1989) surveyed barriers to influenza vaccine acceptance among physicians and nurses. The study was conducted in an

effort to determine the rate of acceptance of influenza immunization among health care providers in light of a recommendation from the Immunization Practices Advisory Committee (ACIP) that health care workers who are in contact with high risk patients for this disease should be immunized annually (CDC, 1989). The survey was conducted through use of a questionnaire ($N = 463$). A response rate of 41.1% ($N = 193$) was obtained. Descriptive statistics were used to analyze the data.

Findings revealed that 2.1% of the physicians and nurses collectively had received the influenza immunization. Reasons cited by employees for not receiving the influenza immunization were analyzed. Nurses were more skeptical of the immunization efficacy than were physicians (37.8% versus 8.2%), and they also were more concerned about side effects (41.8% versus 12.8%). Assurance of vaccine safety and convenience of vaccine administration were believed to be important for acceptance by 55% and 52.4% of the surveyed health care providers, respectively. Nurses and physicians alike stated they would be more inclined to receive immunization if it was a national health care policy (72.8%). Additionally, 35.3% of the respondents reported that they had contracted a flu-like illness during the last year, and 72.8% of that number had cared for patients while ill. Various reasons were cited by the health care providers for caring for patients while ill. More nurses than physicians cited conserving allotted sick leave (28.6% versus 18.5%) and not having any

remaining sick time (18.5% versus 0%). Both nurses (64.5%) and physicians (90.6%) reported that they were motivated to work while ill because the work would have to be done by coworkers if they were absent.

Recommendations by the investigators as a result of this study included education for the need for employees to stay home when ill due to influenza. Additionally, they recommended continued interest in immunization of health care providers by hospital administrators.

Immunization Studies Utilizing the Health Belief Model

Use of the HBM in relation to preventive practices has been documented in the literature. The HBM has been used as an organizing framework for studies in a wide variety of health related activities (Janz & Becker, 1984). However, only four studies were identified that have used the HBM as a framework for research related to immunization practices.

Aho (1979) conducted a study to determine the health beliefs and Swine flu immunization status of elders. Participants included 122 randomly selected individuals from two senior citizen centers. An instrument that consisted of an interview schedule surveyed participants' beliefs that included all of the major concepts of the HBM.

The results determined that there was a significant difference in several areas of beliefs between those elders who were immunized against the Swine flu and those who were not. Specifically, there was a significant relationship for susceptibility, efficacy, and safety. To determine the concept of severity, respondents were asked if they had

ever contracted the flu and how serious the individual perceived that contracting flu in that year might be. Having been immunized had a positive but not significant relationship with the belief of severity. The researcher concluded that those who were immunized might have felt that contracting the disease would not be severe after having been inoculated.

Cummings, Jette, and Brock (1979) applied the HBM model in a study that determined immunization practices related to the Swine flu vaccine. This study used a telephone questionnaire survey to gather data. Participants were randomly selected from random dialing digit procedures to individuals ($N = 274$) in Oakland County, Michigan. The survey was carried out 1 week prior to a Swine flu immunization campaign. Follow-up surveys were conducted on half of the participants immediately after the campaign, while the other half of the follow-up surveys were conducted 2 months later. Health belief dimensions were included in the survey questions.

Findings indicated that each of the four dimensions of the HBM had a significant correlation with immunization status. Cummings et al. (1979) also obtained information about the individuals' intentions to obtain a Swine Flu immunization, which correlated significantly with the respondents' eventual immunization status. The investigators concluded that intentions are important in influencing an individual's immunization behavior.

Larson, Olsen, and Cole (1979) also utilized the HBM as a framework for research related to health beliefs and immunization practices. Participants consisted of 241 elders at high risk for contracting the flu. Slightly more than one half ($n = 144$) of the participants were sent a postcard reminder regarding the need for and availability of the Swine flu inoculation.

Results indicated that health beliefs of susceptibility, severity, and efficacy were significantly correlated with immunization status of the participants. Additionally, elders who received postcard reminders were twice as likely to receive the Swine flu immunization as those who did not. The researchers postulated that the postcards served as a cue to action because there was no difference in the two groups' health beliefs.

Rundall and Wheeler (1979) applied the HBM to research involving immunization behavior. A random sample of 500 elders was surveyed in Tompkins County, New York. Participants were asked if they had been immunized against the Swine flue. Additionally, the respondents were queried about each dimension of the HBM.

Findings revealed positive correlations between the HBM concepts and the individuals' immunization behaviors. Results from logit analysis indicated that the individuals' beliefs accounted for 34% of the variance in outcome. The investigators concluded that the HBM could produce useful results in understanding an individual's readiness to assume recommended preventive health care.

Elder Studies Utilizing Neuman's System Model

Neuman's (1989) Systems Model has been widely used as a supporting framework in a variety of nursing research studies. The Neuman Systems Model is applicable to clients of all ages (Neuman, 1990) and has been utilized as a model for use with families with elders in crisis and decision making (Beckingham & Baumann, 1990). The Neuman Systems Model also has been used to support a functional health pattern assessment model of elders (Beyea & Matzo, 1989). In addition, the Neuman Systems Model has been applied to mental health nursing of elders (Moore & Munro, 1990). However, very few studies were found in which the Neuman Systems Model has been utilized as a framework related to elder research. Several health promotion studies were found that utilized Neuman's Systems Model as a framework. Additionally, no studies were identified that used the Neuman System's Model to support immunization research.

One study relating to elders that utilized the Neuman Health Care Systems Approach was conducted by Delunas (1990). This research focused on prevention of elder abuse. The purpose of the study was to determine a definition of elder abuse and to ascertain trends that impact elder abuse.

Aspects of the intrafamily network that were identified as being potential stressors leading to abuse included: developmental stage of the family, physical and emotional health of each family member, and family values regarding the elder and responsibility for care.

Additionally, ethnic, religious, and cultural values toward elders; the needs of individual family members; and role expectations for each individual were ascertained to be possible stressors that may lead to abuse. The investigators recommended that a thorough assessment should be completed on each family with elders and potential problems should be identified. The researchers also indicated that several nursing diagnoses may reveal an increased risk for abuse in the family. They concluded that more nursing research related to elder abuse should be conducted.

Another study in which the Neuman Systems Model has been used to support research that included elders was conducted by Hinds (1990). This research focused on personal and contextual factors that predicted patients' reported quality of life.

This retrospective cross-sectional study had a sample of 87 individuals aged 38 through 82 years, with the average age of 61 years for the participants. All of the participants were diagnosed with lung cancer. Data were collected through a self-administered questionnaire. The questionnaire combined four previously used instruments in an effort to gather data related to demographic information, reported level of family functioning, information preferences, level of learned resourcefulness, and reported quality of life. Correlational statistics were utilized to test the hypotheses. In addition, stepwise multiple regression was performed to determine the

influence of other variables on quality of life (Hinds (1990)).

Findings indicated that correlations were high between quality of life and the subscales related to health, psychospiritual, socioeconomic, and family criteria. The most highly correlated subscale was health. Variables in this area were further analyzed through regression to account for variance. Seven personal and contextual variables of health were identified that accounted collectively for 30% of the variance in predicting quality of life. The overall contribution of each variable was small, with the prognosis of an individual's illness accounting for the highest (7%) variance in predicting quality of life. Hinds (1990) suggested that, because the contribution of each variable was so small in accounting for the individual's quality of life, this concept was complex and was viewed differently among individuals.

The Neuman Systems Model has been applied to various health promotion studies, because the holistic approach of the model is consistent with supporting healthy life practices. It is a particularly useful model in providing a framework for exploring client systems as they relate to health promotion (Breckenridge, 1989; Gavan et al., 1988). Several health promotion studies were identified that used Neuman's Systems Model as a conceptual basis to guide the research.

Brown, Sirles, Hilyer, and Thomas (1992) conducted a health promotion study that was guided by Neuman's Systems

Model. This study examined the effect of a back school rehabilitation intervention for municipal employees as a cost effective health promotion strategy.

The participants consisted of 70 municipal workers with a history of on-the-job back injuries. The treatment group attended back school for 6 weeks of exercise and education. A comparison group was randomly selected from a group of workers that had been compensated for a work related injury. Data were gathered on both groups related to lost work time, lost time costs, and medical costs. Independent t tests were used to analyze the data.

Results indicated that participants who attended the back school program had significantly fewer injuries in the 6-month period following the intervention. Differences between the groups on time and cost variables were not statistically significant. However, actual money saved in lost time and medical expenses between the groups was concluded to be a practical benefit to the city.

Another study that utilized Neuman's Systems Model to guide research related to health promotion of elders was conducted by Johansen (1989). This study investigated the promotion of health and quality of life of older individuals through prophylactic home nursing visits.

The design of this study was qualitative in nature. Ten elders were randomly selected from the country of Denmark to participate in this research. Structured, taped interviews were utilized to gather data. The interviews were recorded and analyzed for common themes.

The research revealed that the elder participants were generally content with their lives and were able to cope with psychological stressors that occurred. The elders' social networks of friends and family offered important emotional support. The most significant stressors identified were related to physical health. Participants indicated a need for prophylactic home nurse visits in order to manage health problems in the home.

Summary

In summary, although the severe consequences of influenza and pneumonia in elders have been documented in the literature, as has the problem of immunizations and elders, very few studies have been conducted regarding this issue. An extremely limited amount of research in the area of determinants of the underimmunization against these diseases or strategies for improving immunizations was found in a review of the literature. Additionally, there were no studies identified that used Neuman's Systems Model to support research specifically on elders' immunization practices. However, the previous use of this model, both in elder research and in health promotion practices, gives credence to it being used as a framework in a study related to immunization practices of elders. Furthermore, no nursing based studies related to immunizations and elders were found in a review of the literature. Since nurses, and NPs in particular, are primary providers of immunizations to rural elders, additional research

concerning this problem should be conducted within the discipline of nursing.

CHAPTER III

Methodology

The purpose of this quasi-experimental intervention research was to determine the immunization practices of elders and to ascertain reasons for underimmunization among this age group. Additionally, this research attempted to determine the effect of strategies utilizing behavioral cues to improve immunization rates among elders. The study design, setting, subjects, and instrumentation are discussed in this chapter. Also, the data collection procedures and analyses performed are presented.

Design of the Study

This research was a quasi-experimental intervention design with three treatment groups and one control group. Because subjects were not randomly assigned to treatment groups and the independent variables were manipulated by the researcher, the quasi-experimental design was deemed appropriate (Polit & Hungler, 1991).

Setting and Subjects

The setting consisted of three rural health clinics in small medically underserved communities in northern Mississippi. The health clinics used were free-standing clinics that utilized only NPs as the sole primary care providers on site. These clinics were identified through

information provided by the Mississippi State Board of Nursing.

The subjects were individuals, aged 65 years or older, who visited the selected clinics during the months of data collection, which were October, November, and December. These months were selected as this is the recommended time of year for influenza immunizations. Because pneumonia immunizations may be given at any time of the year and may be given in conjunction with the influenza immunization, this was deemed the ideal time frame for the collection of data. Additionally, only those elders who were cognitively intact, as determined by the absence of any diagnosis in the chart related to cognitive impairment, such as senile dementia, Alzheimer's disease, and multi-infarct dementia, were included in the study. Of these 1,047 elders identified who were eligible to participate in the study, 393 subjects were included in the final sample.

All elders who met the criteria and who agreed to participate were included in the study until there was a minimum of 44 elders in each of the four groups. This number was determined to be acceptable for comparison of groups utilizing ANOVA, according to Cohen's Formula (Dr. Michael Milliken, personal communication, June 15, 1995; Polit & Hungler, 1991). This estimation was based on a conventionally acceptable power value of .80, a medium effect size of .60, and a significance level of .05 (Polit & Hungler).

Instrumentation

The Demographic Survey (Appendix D) was used to assess common characteristics of the client. Demographic variables surveyed include the following: age, sex, race, education, site of primary health care, source of payment for medical care, transportation, and a self-rating of health. These characteristics were selected from a review of the literature as being pertinent to elders. The Demographic Survey was piloted during the Summer of 1994.

In the pilot study, the immunization practices of the participants were assessed in an effort to determine if adequate protection against influenza and pneumonia existed by using a researcher-developed Immunization Survey (Appendix A). The Immunization Survey was used to determine which of the elder immunizations of concern the elders had or had not ever received. Question 1 asked, "When was the last time you had a flu shot?" and Question 3 asked, "When was the last time you had a shot to prevent pneumonia?" Response options included the following categories: "never," "more than 10 years ago," "6-10 years ago," "2-5 years ago," "last year," and "unsure."

Further, the Immunization Survey attempted to ascertain the reasons that elders were not receiving the inoculations. Several options were given for elders to select as reasons for not being immunized. These options were gleaned from a review of the literature as being pertinent to immunization practices of elders. It was determined at the time of instrument development that the

Immunization Survey was an efficient tool to gather data regarding reasons for immunization practices of elders for purposes of the pilot study.

Various options were listed on the Immunization Survey in an effort to determine reasons that elders did not obtain influenza or pneumonia immunizations. Response options relating to reasons for not being immunized included: "Did not think I needed it," "Could not afford it," "Was afraid of shots," "Had no transportation to get the immunization," "Did not know there was a flu/pneumonia shot," "Afraid the shot would cause me to have pneumonia/flu symptoms," "Had a reaction to a flu/pneumonia shot in the past," "My doctor or nurse practitioner didn't tell me I needed it," and "Other" for a write-in response.

Pilot Study

Creation of the Demographic Survey and the Immunization Survey was supported by a pilot study conducted by the researcher in the Summer of 1994. This study was performed in an effort to test the instruments on a target population of elders in the community.

The subjects for the pilot study were a sample of convenience selected from a senior group at a church in Columbus, Mississippi. A sample of 18 participants was obtained. Permission was obtained from the pastor of the church to gather data. A letter was personally taken to the church explaining the purpose of the study and protection of human rights of the participants. An agency consent form was developed for the pastor to sign.

The data collection occurred on two different Sundays, immediately before Sunday School, as the classes assembled. During data collection, the purpose of the study was explained to the elders in the Senior Sunday School groups. The elders were assured that their answers would remain anonymous and results of the study would be reported as group responses only. They were told that participation was voluntary and that they were free to withdraw from the study at any time. Questions were answered and the elders were asked to sign an informed consent if they chose to participate. No one declined to participate and all signed consent forms. Participants were then asked to complete the researcher-designed Demographic Survey and the Immunization Survey.

Results of the Demographic Survey in the pilot study were analyzed, using descriptive statistics of frequency, mean, and median. A total of 18 subjects participated in the pilot study. Twelve (66.7%) of the participants were female and 6 (33.3%) were male. All were aged 65 years or older. Respondents were asked to indicate age by placing a check mark on a blank corresponding to their age range. The majority of the elders wrote in an actual age on the age range blank line, instead of merely placing a check mark on the appropriate blank. Of the respondents who specified their age, two were 67 years, three were 68 years, one was 69 years, two were 71 years, one was 72 years, one was 75 years, and one was 83 years. For this group, the mode was 68 years, the mean was 70.8 years, and

the median age was 75 years. The other respondents merely indicated that they were in the 65- to 75-year-old range.

There was a variety of responses to the question concerning highest grade in school completed. The responses were as follows: one (5.6%) individual's highest level of education was 1st through 6th grade, five (27.7%) indicated 7th through 8th grade, one (5.6%) responded 9th through 11th grade, six (33.3%) indicated they had graduated from high school, one (5.6%) graduated from junior college, and one (5.6%) did not respond to this question.

Revisions were made in the Demographic Survey and Immunization Survey as a result of the pilot study. For instance, on the Demographic Survey, the age category was collapsed to allow for an actual response in years, rather than a choice of age ranges. Revisions also were made in the Immunization Survey as a result of the pilot study. Reasons given by elders for not receiving immunizations indicated that other responses were needed. Many elders wrote in responses when the given options did not fit. Other elders might have chosen those written comments as a response if that option had been on the survey. For example, several elders responded that the reason for not receiving immunizations was that the physician or clinic nurse had not indicated that these inoculations were needed. A revision in the instrument was made, therefore, to add the option of "My doctor or nurse practitioner didn't tell me I needed it."

Subsequently, the revised Immunization Survey instrument was reviewed by a panel of gerontology experts in an effort to establish content validity. The instrument was mailed to a group of 30 experts in gerontology throughout Mississippi, Alabama, Tennessee, and Louisiana. All of the panel of experts had at least a master's degree in gerontology and had worked extensively with elders. Minor revisions were made, mainly in the format, as a result of the feedback from the gerontology panel, but the content of the instrument was validated by the experts. A change was made in the wording of the responses to Items 2 and 4 from "felt it would cause me to have flu/pneumonia symptoms" to "thought it would cause me to have flu/pneumonia symptoms." Also revisions to choices in Items 2 and 4 were made by adding the response of "had a reaction to a flu/pneumonia shot in the past."

Suggestions for revisions in format included adding a border around the survey and vertical alignment of the responses to Questions 1 and 3. Other format suggestions included placing the blank to be checked in front of the options.

Procedure for Data Collection

Permission was obtained from the Institutional Review Board (IRB) at The University of Alabama at Birmingham (UAB) to conduct the study (Appendix E). Permission also was obtained to conduct the study from three selected rural health clinics staffed by NPs in medically underserved

areas of northeast Mississippi to conduct the study in these clinics (Appendix F).

The researcher visited the first clinic, Clinic A, to be introduced to the receptionist and the NPs that staffed the clinic. The purpose of the study was described in general terms to the personnel as an investigation into the immunization practices of elders. An alphabetized computer printout of all patients who were potential subjects, aged 65 years or older, was obtained from each clinic. Subsequently, the chart of each patient was checked to verify age to ascertain that the potential subject was cognitively intact as indicated by the absence of a diagnosis related to cognitive impairment.

All charts of potential subjects as identified by the computer printout at Clinic A were marked with a color coded sticker reminding the receptionist to invite these elders to participate in the study if they visited the clinic during the months of data collection. Identified elders were asked to complete the informed consent forms (Appendix G) and complete the Demographic Survey and Immunization Survey if they wished to participate in the study. A box was placed at the reception desk for completed consent forms and surveys. NPs at the clinic also were alerted as to the significance of the stickers, as a reminder to invite patients to participate in the study if they had not already done so when they reached the examination room.

The charts of all subjects at Clinic A who were eligible to participate in the study were divided into two groups, with every other chart identified from the alphabetized computer list color coded with a blue sticker, designating control group (Group 1), or a red sticker, designating treatment group (Group 2). In addition, the informed consent, Demographic Survey, and Immunization Survey forms were color coded, delineating either treatment or control group and placed in the front of the respective charts. The control group received no cue to action nor did the NPs from whom they obtained care. However, all clients, even those in the control group, who asked for immunizations during the time of the study, received them. Additionally, NPs were not asked to change normal preventive practices during the time of the study. The subjects in Group 2 from Clinic A received postcard reminders as behavioral cues to action regarding immunizations. The postcards, mailed the first week in September, reminded this group of subjects to make appointments at the clinic in order to receive the influenza, pneumonia, or both immunizations.

Next, the researcher visited Clinics B and C, where again the purpose of the study was explained in general terms to the receptionist and the NPs. Additionally, at Clinics B and C, all NPs were exposed to a fact sheet as a cue to increase awareness about the consequences of influenza and pneumonia on unimmunized elders. The researcher attempted to expand the NPs' familiarity with

the consequences of underimmunization of elders at this site through a discussion of fact sheets related to influenza and pneumonia. Brightly colored fact sheets were left in these clinics to be used for a reference by the NPs.

The same procedure for identifying and inviting subjects to participate as described for Clinic A was used for Clinics B and C. In addition, the same procedure as used at Clinic A was used to divide the charts of the subjects into two groups, which were color coded green (Group 3 subjects were treated by NPs who had been exposed to the fact sheet cues) and yellow (Group 4 subjects received a postcard reminder in addition to being treated by NPs who had been exposed to the fact sheets). The same postcard and mailing schedule that was used for the subjects in Group 2 was used for the subjects in Group 4.

The four groups in the study, therefore, consisted of a control group and three treatment groups. Group 1 was the control group in which the participants received no cues in the form of postcard reminders, nor did the NPs receive cues in the form of immunization fact sheets. The subjects in Group 2 received the behavioral cue of a postcard reminder only. Group 3 participants received care from the NPs who had received a cue to action in the form of the influenza and pneumonia fact sheets, but the subjects themselves did not receive a postcard reminder cue. Subjects in Group 4 received the postcard reminder as

well as receiving care from the NPs who had been exposed to the fact sheets.

In January, following the data collection period, the researcher went back to Clinics A, B, and C to collect the completed consent forms and surveys. Additionally, the investigator went through each group of color coded charts to determine how many elders received influenza, pneumonia, or both immunizations during the 3 preceding months. A record was made for all four groups, indicating whether each individual received the influenza, pneumonia, both immunizations, or no immunization.

Data Analyses

At the end of the data collection period, descriptive statistics were utilized to analyze the Demographic Surveys. The Immunization Surveys of each subject were scored by giving a 0 to each participant who received no immunizations, a 1 to each individual who received either an influenza or pneumonia immunization, and a 2 to each individual who received both immunizations. This allowed the researcher to give a mean score to each group and further allowed comparison of the mean scores for the control group with each of the three treatment groups to be made. An ANOVA was utilized to analyze the differences in the mean scores among the groups, which was deemed appropriate as a parametric statistical test used for analyzing the differences between the means of four groups (Polit & Hungler, 1991).

A post hoc comparison was performed on the data if there was a significant difference among the groups to determine where the differences occurred. Tukey's Honestly Significant Difference (HSD) test was selected as an appropriate post hoc test for making all possible pairwise comparisons between the means of the groups after the ANOVA had indicated that one or more significant difference existed among the groups (Diekhoff, 1992). Finally the Least Significant Difference (LSD) post hoc test was performed to further discriminate any significant differences determined by the ANOVA.

Additionally, data were analyzed to determine if the cues had an effect on elders who had previously not followed CDC guidelines for immunizations. This included subjects who indicated that they had not received an immunization for influenza the previous year or who had never received an immunization against pneumonia. An ANOVA was utilized to analyze the differences in the mean scores among the groups of elders who had not previously adhered to suggested immunization practices. Post hoc tests of Tukey's HSD and the LSD were utilized to determine which groups had the significant differences as identified by the ANOVA.

Summary

Empiricalization of the problem of immunization practices of elders was discussed. The design, setting, subjects, and instrumentation for the study have been described. Further, the procedure for data collection has

been discussed, and the data analysis methods utilized in this study were described.

CHAPTER IV

Findings

In this chapter, findings from data analyses are presented. The Statistical Package for Social Sciences (SPSS) computer package was utilized to analyze the data. Characteristics of the sample are described, followed by the findings related to the hypotheses. Finally, additional findings from data analyses are presented.

Sample Characteristics

The target sample consisted of all elders who were patients at three rural health clinics in which NPs were the only primary care providers. At these selected clinics, 1,065 patients were identified as individuals aged 65 years or over who were eligible to participate according to the age criteria. Of these, 18 elders were excluded from participation in the study due to cognitive impairment, as determined by any diagnosis in the chart related to cognitive impairment, such as senile dementia, Alzheimer's disease, or multi-infarct dementia. Each of the eligible remaining 1,047 elders' charts were color coded with a sticker reminding office personnel to ask these clients to sign consent forms to participate in the study if they visited the clinic during the months of data collection.

The final sample consisted of 393 elders of the total 1,047 eligible elders, aged 65 years or older, who visited the three selected rural health clinics during the data collection months of October, November, and December and who consented to participate in the study. All subjects who agreed to participate in the study met the study criteria of age and the absence of any diagnosis indicative of cognitive impairment. Each subject voluntarily signed a consent form to participate in the study and was assured that his or her care at the clinic would in no way be affected by nonparticipation in the study.

The 1,047 eligible subjects were divided into four groups according to the intervention received and a final sample of 393 participants was obtained. Group 1 received no intervention and consisted of 111 elders. Group 2 consisted of 116 subjects who received a postcard reminder as a behavioral cue to action. Group 3 consisted of 76 elders who received care from NPs who were exposed to fact sheets on influenza and pneumonia. Group 4 consisted of 90 subjects who were mailed a postcard reminder and in addition received care from NPs who were exposed to the fact sheets on influenza and pneumonia. A total of 525 postcards were mailed to subjects who were in groups that received this cue. The final numbers of subjects in the groups were uneven in number due to two reasons. First, there were varying numbers of elders in each group who were willing to participate in the study. Secondly, there were different numbers of elders in each group who visited the

clinics during the data collection months of October, November, and December and, therefore, were available to sign the consent form, complete the surveys, and participate in the study.

Demographic Data

Demographic data of the sample were obtained from the Demographic Survey. Demographic characteristics are presented for each of the nine questions on the survey.

The ages of the 393 subjects ranged from 65 years to 94 years of age. The mean age was 74.05 years, with a median age of 73 years and a mode of 68 years. A summary of the sample characteristics of age is depicted in Table 1.

Table 1

Summary of Sample Characteristics for Age by Frequency and Percentage

Age in years	Frequency	Percentage
65 - 69	112	28.5
70 - 74	116	29.6
75 - 79	86	21.9
80 - 84	54	13.7
85 - 89	17	4.3
90 - 94	8	2.0

Note. N = 393.

Of the 393 participants in the study, 133 (33.8%) were male, and 258 (65.6%) were female, and two subjects (0.6%)

did not report gender. In response to race, 35 (8.9%) subjects ($n = 393$) were African American, 357 (90.8%) were Caucasian, and 1 participant (0.3%) did not report race.

Educational level of the study participants in terms of highest grade of school completed ranged from completion of the first grade to completion of graduate education. Nine individuals (2.3%) did not report educational level. A summary of the sample characteristics by highest level of education completed is presented in Table 2.

Table 2

Summary of Sample Characteristics for Education
by Frequency and Percentage

Highest educational level	Frequency	Percentage
1st to 6th grade	59	15.4
7th to 8th grade	92	23.9
9th to 11th grade	107	27.9
Graduated from high school	89	23.2
Completed some college courses	19	4.9
Graduated from junior college	12	3.1
Graduated from a 4-year college	3	.8
Completed some graduate courses	2	.5
Received a graduate degree	1	.3

Note. $n = 384$.

The majority of subjects ($n = 200$, 50.9%) reported health care was usually received in a health clinic, while 174 subjects (44.3%) reported usually receiving health care

in a doctor's office. Ten (2.5%) subjects reported usually receiving health care either in a public health department, emergency room, or from visiting nurses. The remaining nine (2.3%) subjects did not respond to this question.

A majority ($n = 363$, 92.4%) of the subjects indicated that medical care was paid for by Medicare. In addition, 116 subjects (29.5%) reported health care was paid by Medicaid, and 122 (31.0%) reported payment by private insurance. Of the remaining subjects, there were 26 (6.6%) who paid for health care with cash, 1 (0.3%) who charged expenses, and 1 (0.3%) who was unable to pay. Four subjects (1.0%) did not respond to the question regarding health care payment. Total responses add up to more than 100% because participants were instructed to respond to all options that applied and some subjects selected more than one option.

The reported self-health ratings by participants ranged from excellent to poor. Four participants (1%) did not report health status. Table 3 depicts a summary of the sample characteristics of self-reported health ratings.

Of the 393 subjects, 264 (67.2%) reported yes to the question concerning if they drove a car and 128 (32.5%) reported no. One participant (0.3%) did not report driving status. The majority of subjects ($n = 206$, 52.4%) reported living with someone who drove, while 174 subjects (44.3%) reported they did not live with someone who drove, and 13 subjects (3.3%) did not answer.

Table 3

Summary of Sample Characteristics of Health Rating
by Frequency and Percentage

Health rating	Frequency	Percentage
Excellent	32	8.2
Good	165	42.4
Fair	174	44.7
Poor	18	4.6

Note. $n = 389$.

Findings Related to Research Questions

Data regarding immunization practices of the sample were obtained from the Immunization Survey. Data were analyzed using descriptive statistics to answer the two research questions: "What are the immunization practices of elders?" and "What are the reasons for the immunization practices of elders?"

Research Question 1

The first research question for this study was "What are the immunization practices of elders?" Participants were asked two questions related to immunization practices on the Immunization Survey. The first related question asked on the Immunization Survey was, "When was the last time you had a flu shot?" Three subjects (0.8%) reported being unsure of when the last influenza shot was taken and 12 (3.1%) subjects did not respond to the question.

Responses by the remaining 378 subjects are reported in Table 4.

Table 4

Influenza Immunization Practices of Elders by Frequency and Percentage

Last time flu shot received	Frequency	Percentage
Never	36	9.5
More than 10 years ago	15	4.0
6 to 10 years ago	10	2.6
2 to 5 years ago	28	7.4
Last year	289	76.5

Note. $n = 378$.

The third question on the Immunization Survey also related to the immunization practices of elders and asked, "When was the last time you had a shot to prevent pneumonia?" Ten subjects (2.6%) were unsure about when they last had a pneumonia shot and 15 subjects (3.8%) did not respond to this question. Findings from this question are presented in Table 5.

Research Question 2

The second research question was "What are the reasons for the immunization practices of elders?" Questions 2 and 4 on the Immunization Survey were related to immunization practices. Question 2 asked, "If you have never had a flu shot or you did not receive a flu shot within the last year, what was the reason?" Seven subjects (3.3%) wrote

Table 5

Pneumonia Immunization Practices of Elders by
Frequency and Percentage

Last time had pneumonia shot	Frequency	Percentage
Never	141	38.3
More than 10 years ago	24	6.5
6 to 10 years ago	30	8.2
2 to 5 years ago	79	21.5
Last year	94	25.5

Note. $n = 368$.

in responses in the "other" option. Write-in responses included: "Make(s) me sick," "Allergic to eggs," "Just don't take them," "Had sinusitis after," "Had one last year," "Don't want flu shot," "Did not think I needed it, but took one today after nurse practitioner talked to me," and "I forgot." Total responses do not add up to 100%, as only subjects who did not receive a flu shot last year were instructed to respond and subjects could select more than one reason for not seeking vaccination. Findings from responses by the remaining subjects are reported in Table 6.

Question 4 on the Immunization Survey also related to the reasons for the immunization practices of elders and asked, "If you have never had a shot to prevent pneumonia indicate the reasons." Eleven subjects ($n = 85$, 12.9%) wrote in responses in the other option. Write-in responses

Table 6

Reasons Selected by Elders for Not Receiving Flu Shots by Frequency and Percentage

Reasons	Frequency	Percentage
I did not think I needed it	38	44.7
Could not afford it	0	0.0
Was afraid of the pain	0	0.0
Had no transportation	2	2.4
Did not know there was a flu shot	2	2.4
Had a reaction in the past to a flu shot	19	22.3
Thought it would cause me to have flu symptoms	13	15.3
My doctor or nurse practitioner didn't tell me I needed it	4	4.7
Other	7	8.2

Note. $n = 85$.

included: "It would make me sick," "Had not considered taking it," "Did not know there was a pneumonia shot, but got it today," "Forgot to get it," "Lack of information," "Just don't take them," "I would never need another shot," and "Not sure why." Findings from responses of participants to Question 4 on the Immunization Survey are found in Table 7. Total responses do not add up to 100%, as only subjects who never received a pneumonia shot were instructed to respond and subjects could respond to more than one answer.

Table 7

Reasons Selected by Elders for Not Receiving
Pneumonia Shot by Frequency and Percentage

Reasons	Frequency	Percentage
I did not think I needed it	100	66.2
Could not afford it	0	0.0
Was afraid of the pain	1	0.7
Had no transportation	2	1.3
Did not know there was a pneumonia shot	24	15.9
Had a reaction in the past to a pneumonia shot	1	0.7
Thought it would cause me to have flu/pneumonia symptoms	4	2.6
My doctor or nurse practitioner didn't tell me I needed it	8	5.3
Other	11	7.3

Note. $n = 85$.

Findings Related to Research Hypotheses

Seven research hypotheses were generated for this study. Operations for data analysis were used as previously described for the research hypotheses.

Research Hypothesis 1

There will be no difference between immunization practices of elders who: (a) are in the control group and receive neither postcard reminders as behavioral cues to action nor obtain care from NPs who were exposed to fact sheets as behavioral cues to action, (b) receive a postcard

reminder, (c) obtain health care from NPs who were exposed to immunization fact sheets, (d) receive both a postcard reminder and also obtain health care from NPs who were exposed to immunization fact sheets.

Group 1 consisted of 111 elders who received no intervention and was the control group for the study. The subjects in this group received no behavioral cues in the form of a postcard reminder. Likewise, the NPs from whom they received care received no cues in the form of immunization fact sheets. Of this group, 44.1% ($n = 49$) of the elders received immunizations during the data collection period. Group 2 consisted of 116 subjects who received a postcard reminder as a behavioral cue to action. In Group 2, 52.6% ($n = 61$) of the subjects received immunizations during the data collection period. The Group 3 sample consisted of 76 elders who received care from NPs who were exposed to immunization fact sheets. In Group 3, 51.3% ($n = 39$) of the participants received immunizations during the fall months of data collection. Group 4 consisted of 90 subjects who were mailed a postcard reminder and also received care from NPs who were exposed to the immunization fact sheets. In Group 4, 76.7% ($n = 69$) of the elders received immunizations during the data collection months.

The Immunization Survey of each subject were scored by giving a 0 to each participant who received no immunizations, a 1 to each individual who received either an influenza or pneumonia immunization, and a 2 to each

individual who received both immunizations. This allowed the researcher to give a mean score to each group and further allowed comparison of the mean scores for the control group and each of the three treatment groups to be made. The ANOVA was utilized to analyze the differences in the mean scores between the groups. The ANOVA revealed that there was a significant difference among the groups with different interventions and the group with no intervention, $F(3,389) = 8.84, p = .0000$. Therefore, the null hypothesis was rejected. Findings from the analysis of Research Hypothesis 1 can be found in Table 8.

Table 8

One-Way Analysis of Variance Comparing Mean Scores Between Groups of Elders Receiving Three Different Interventions and Those Receiving No Interventions

Groups	<u>DF</u>	<u>SS</u>	<u>MS</u>	<u>F Ratio</u>	<u>F Prob</u>
Between groups	3	10.11	3.37	8.84	.0000*
Within groups	389	148.30	0.38		
Total	392	152.41			

* $p < .05$.

Research Hypothesis 2

There will be no difference between immunization practices of elders who receive a postcard reminder and elders in the control group who receive neither postcard reminders nor obtain care from NPs who were exposed to immunization fact sheets. Because the ANOVA revealed a significant difference among the groups, post hoc tests

were performed on the data to determine where the significant difference among the groups occurred. The Tukey HSD post hoc test and the LSD procedure both revealed that there was no significant difference in immunization practices between the group with no intervention and the group that received the postcard reminder as a behavioral cue. The mean group score for the group with no intervention was .4865 and the mean group score for the group that received the postcard cue was .6034. Therefore, the researcher failed to reject the null hypothesis.

Research Hypothesis 3

There will be no difference between immunization practices of elders who obtain health care from NPs who were exposed to immunization fact sheets and elders in the control group who receive neither postcard reminders nor obtain care from NPs who were exposed to immunization fact sheets. Post hoc tests were performed on the data to determine if there was a significant difference between these groups. The Tukey HSD post hoc test and the LSD procedure both revealed that there was no significant difference between the group with no intervention and the group that received health care from NPs who had been exposed to fact sheets regarding influenza and pneumonia as a cue to increase awareness. The mean score of the group receiving no intervention was .4865, while the mean score of the group receiving the described intervention was .5921. Therefore, the researcher failed to reject the null hypothesis.

Research Hypothesis 4

There will be no difference between immunization practices of elders who receive a postcard reminder as a cue to action and also obtain care from NPs who were exposed to immunization fact sheets and elders in the control group who receive neither postcard reminders nor obtain care from NPs who were exposed to immunization fact sheets. Post hoc tests were performed on the data to determine if there was a significant difference between these groups. The Tukey HSD post hoc test and the LSD procedure both revealed that there was a significant difference between the group with no intervention and the group that received a postcard as a behavioral cue to action and also obtained health care from NPs who had received fact sheets as cues to increase awareness. The mean score of the group receiving no intervention was .4865, while the mean score of the group receiving the described intervention was .9222. Thus, the null hypothesis was rejected.

Research Hypothesis 5

There will be no difference between immunization practices of elders who receive postcard reminders and obtain care from NPs exposed to immunization fact sheets and elders who only receive postcard reminders but do not obtain care from NPs who were exposed to immunization fact sheets. The mean score of the group receiving the postcard and care from NPs who were exposed to fact sheets was .9222, while the mean score of the group receiving the

postcard cue only was .6034. Post hoc tests were performed on the data to determine if there was a significant difference between these groups. The Tukey HSD post hoc test and the LSD procedure both revealed a significant difference between the group that received the postcard as a behavioral cue to action and obtained health care from NPs who had received fact sheets as cues to increase awareness and those who only received a postcard behavioral cue. Therefore, the null hypothesis was rejected.

Research Hypothesis 6

There will be no difference between immunization practices of elders who receive postcard reminders but do not obtain care from NPs who were exposed to immunization fact sheets and elders who only obtain care from NPs who were exposed to immunization fact sheets but do not receive postcard reminders. Post hoc tests were performed on the data to determine if there was a significant difference between these groups. The Tukey HSD post hoc test and the LSD procedure both revealed that there was no significant difference between the group that received a postcard as a behavioral cue to action and those obtained health care from NPs who had received fact sheets as cues to increase awareness but had not received a postcard reminder behavioral cue. The mean score of the group receiving the postcard reminder was .6034 and the mean score of the group receiving no postcard reminders but obtaining health care from the NPs who were exposed to the fact sheets was .5921.

Therefore, the researcher failed to reject the null hypothesis.

Research Hypothesis 7

There will be no difference between immunization practices of elders who receive postcard reminders and also obtain care from NPs who were exposed to immunization fact sheets and elders who do not receive postcard reminders but obtain care from NPs who were exposed to immunization fact sheets. Post hoc tests were performed on the data to determine if there was a significant difference between these groups. The Tukey HSD post hoc test and the LSD procedure both revealed that there was a significant difference between these groups. The mean group score for those receiving a postcard behavioral cue and obtained care from the NPs who had been exposed to fact sheets was .9222. The mean group score for those receiving care from the NPs who had received the fact sheets but who did not receive the postcard reminders was .5921. Thus, the null hypothesis was rejected.

Additional Data Analysis

Data were additionally analyzed to determine if the interventions had an effect on elders who had previously not followed the CDC guidelines for immunizations. All participants in the study who indicated on the Immunization Survey that they had not received an immunization for influenza in the previous year or who had never received an immunization against pneumonia were identified as individuals not being immunized according to CDC guidelines

(CDC, 1989). An ANOVA was utilized to analyze the differences in mean scores among the groups of elders in each of the groups who were not previously immunized according to suggested guidelines. Among these elders, the mean score for the group who received no intervention was .2883, while the mean group score for the group who received a postcard reminder was .3707. The mean group score for the group who received care from NPs exposed to fact sheets was .6184 and the group mean score for the group who received care from the NPs exposed to fact sheets and also received a postcard reminder was .5222.

The ANOVA revealed that there was a significant difference between elders in the groups with different interventions and the group with no intervention, $F(3,389) = 8.77$, $p = .0000$. Data analyses of differences between the control group and the three other groups who had not previously been immunized according to CDC guidelines are presented in Table 9.

Post hoc tests of Tukey's HSD and the LSD were utilized to determine which groups had the significant differences as identified by the ANOVA. The Tukey HSD revealed a significant difference among these elders who had not previously followed immunization recommendations between the group receiving no intervention and the group receiving care from the NPs who had been exposed to the immunization fact sheets. There also was a significant difference between the group who received no intervention and those who received a postcard cue in addition to

Table 9

One-Way Analysis of Variance Comparing Mean Scores
Of Elders Who Had Not Previously Followed CDC
Immunization Guidelines Between the Control Group
and the Three Intervention Groups

Groups	DF	SS	MS	F Ratio	F Prob
Between groups	3	6.10	2.03	8.77	.0000*
Within groups	389	90.22	0.23		
Total	392	96.33			

*p < .05.

receiving care from NPs who were exposed to the immunization fact sheet cues. Additionally, the Tukey HSD revealed a significant difference in immunization practices between the elders in the group that received a postcard reminder and the group that received health care from the NPs who received the fact sheets but did not receive postcards.

Further post hoc analysis utilizing the LSD procedure revealed that, in addition to the significant differences previously described, there was also a significant difference among these elders who had not previously followed immunization recommendations between the group who received a postcard reminder and those who received a postcard reminder as well as receiving care from NPs who were exposed to fact sheets.

Summary of Findings

Descriptive statistics were utilized to analyze data for the purposes of determining the immunization practices

of elders and the reasons for those practices. The majority of subjects ($n = 289$, 73.5%) indicated that they had received an influenza immunization last year. Of those who had not obtained an influenza inoculation last year, the most frequent reason was "I did not think I needed it" ($n = 38$, 9.7%). Nineteen elders (4.8%) indicated having "had a reaction in the past to a flu shot," while 13 (3.3%) gave "thought it would cause me to have flu symptoms" as a reason for not receiving the inoculation. The majority of participants ($n = 100$, 25.4%) who indicated reasons for not obtaining a pneumonia immunization responded, "I did not think I needed it," while 24 subjects (6.1%) responded "did not know there was a pneumonia shot."

Data were collected and analyzed for the purposes of determining if there was a difference in immunization practices of elders between the three groups in which there were various behavioral cues used as interventions and a group in which there was no intervention. An ANOVA revealed that there was a significant difference between the groups. Post hoc analysis was used to determine where the significant differences existed. Examination of the data revealed significant differences in immunization practices of elders between the group of elders who received a postcard reminder and were treated by the NPs who received the fact sheets and (a) the group that received the postcard reminder as a cue to action, (b) the group that received health care from the NPs who were exposed to the fact sheets as a cue to increase awareness,

and (c) those elders in the control group who received no intervention. Data were additionally analyzed to determine if the interventions had no effect on elders who had previously not complied with CDC guidelines for immunizations. The ANOVA revealed that there were significant differences in immunization practices among the four groups of elders who had not followed suggested immunization guidelines in the past. The Tukey post hoc analysis revealed a significant difference between the group receiving no intervention and (a) the group receiving care from the NPs who had been exposed to the fact sheets, and (b) the group that received a postcard reminder and obtained health care from the NPs who were exposed to fact sheets. Additionally, the Tukey post hoc analysis revealed a significant difference among the group of elders who did not follow CDC immunization recommendations between the group that received health care from the NPs who received the fact sheets but did not receive postcards and the group that received the postcard reminders only. Further post hoc analysis utilizing the LSD procedure for these groups of elders revealed a significant difference between those who received a postcard reminder and those who received a postcard reminder and also received care from NPs who were exposed to fact sheets.

CHAPTER V

Discussion, Conclusions, Implications, and Recommendations

A quasi-experimental intervention design was utilized in this study to determine the immunization practices of elders and to ascertain reasons for underimmunization among this age group. Additionally, this research compared strategies utilizing behavioral cues to improve immunization rates among elders. Discussion of the findings, conclusions, implications for nursing, and recommendations for future research are presented.

Discussion of Findings

There was a total of 1,047 eligible elders at the three selected clinics, aged 65 years or older, who did not have any diagnosis related to cognitive impairment. The final sample consisted of 393 (37.5%) elders who visited the three selected rural health clinics in Mississippi during the data collection months of October, November, and December and who consented to participate in the study. A total of 525 postcards were mailed to the eligible subjects who were in the two groups that received this cue. Possible explanations for the size of the final sample include elders not receiving the postcard reminders due to a change of address, lost mail, or not visiting the clinics during the months of data collection. Additionally, it is

possible that elders may have had visual problems or illiteracy that prevented them from responding to the postcard or completing the surveys. Further, those elders who did visit the clinics may not have been willing to sign the consent form and participate in the study.

Demographic Characteristics

Characteristics regarding the demographics of the sample were obtained from responses on the Demographic Survey. Subjects' ages ranged from 65 years to 94 years of age, with a mean age of 74.05 years, which was consistent with the Mississippi elder mean age of 74.32 years and the national elder mean age of 72.52 years (U.S. Bureau of the Census, 1990). The sample consisted of 65.6% females and 33.8% males. These findings are congruent with the national elder gender distribution of 59.8% females and 40.2% males (U.S. Bureau of the Census). However, there were slightly more females in the sample than in the national statistics. This gender distribution may be explained by females being more willing to participate in this research study about immunizations than were males. Another possible explanation for the gender distribution in the sample may be that more females seek preventive care than males.

The majority (90.8%) of the participants in the study were Caucasian, and 8.9% were African American. These findings are congruent with the national racial distribution of 80.3% Caucasian and 12.1% African American but are inconsistent with the demographics of Mississippi,

in that 64.1% of all individuals in this state are Caucasian and 35.9% are African-American (U.S. Bureau of the Census, 1990). Although the sample was not representative of the racial makeup of the state as a whole, it may represent the percentage of African-American elders who seek primary care from a rural health clinic. It may also be that African-American elders were less willing than Caucasian elders to participate in this study.

Individuals' educational levels in terms of highest grade of school completed ranged from those completing the first to the sixth grade to one elder who received a graduate degree. The highest percentage of participants (27.2%) reported the 9th to the 11th grade as the highest level of education received, closely followed by 23.9% who reported 7th to 8th grade, and 23.2% who reported completion of high school. These findings vary slightly from the educational level of elders nationally, in that the majority (34.2%) of individuals aged 65 years and over in the United States completed high school, while 24.1% have completed less than 9th grade, and 15.6% have completed the 9th to the 11th grade as the highest level of education received (U.S. Bureau of the Census, 1996).

The difference between the educational levels of elders nationally and the participants in this study may be explained by the fact that the study took place in a poor, rural state in which individuals traditionally had been encouraged to help work on family farms rather than complete a formal education. The educational level for

elders in this study also varied slightly from those statewide, in that 36.7% of individuals aged 65 years and older in Mississippi completed less than 9th grade, 23.8% completed 9th to 11th grade, and 20.1% completed high school (U.S. Bureau of the Census, 1993). Although the reasons for these variations are unknown, it may be that elders who participated in the study were slightly better educated than the average elder in Mississippi and those who were less educated chose not to participate.

Of the 393 subjects, the majority (92.4%) indicated that medical care was paid for by Medicare, while 116 individuals (29.5%) reported Medicaid was the usual method of payment, and 122 (31%) reported private insurance. Because only one subject reported a need to charge medical expenses and only one other subject reported not being able to pay for medical expenses, cost did not seem to be a major barrier to seeking immunizations for 98% of this sample. However, there may have been individuals in the associated rural communities for whom cost may have been a barrier and therefore had never sought care at one of the three clinics and consequently were not included in this study.

In response to transportation questions, 264 (67.2%) elders indicated that they drove a car, while 206 (52.4%) responded that they lived with someone who drove a car. These responses may indicate a potential problem for rural elders in obtaining transportation to a primary care facility to obtain needed immunizations, because only

slightly over half of the elders indicated that they drove or lived with someone who drove.

Self-reported health status ranged from excellent to poor for participants in the study, with a majority (44.3%) indicating fair health and 42% indicating good health. Only 18 (4.6%) of the subjects indicated a poor health rating. This was not a surprising finding in that the study was conducted in an ambulatory health care setting, and those elders in the poorest health may not have been able to come to the clinic to receive care.

Research Questions

The findings of this study indicated that the majority of the subjects received immunizations as recommended according to the CDC guidelines (CDC, 1989). Of the 378 elders who responded to the question, "When was the last time you had a flu shot?", 289 (73.5%) indicated last year, which is in accordance with CDC recommendations. These results were higher than national estimates in which experts approximate that 20% to 30% of all elders receive influenza immunizations each year (Fedson et al., 1990; Marchiondo, 1991). This finding may be explained by the fact that elders in the current study were receiving primary care from NPs whose emphasis in health care is on prevention.

In response to the question, "When was the last time you had a shot to prevent pneumonia?", only 57.7% indicated that they had ever received this immunization. Additionally, 35.9% of the subjects indicated they had

never received this immunization, with all others not responding or marking unsure. Since CDC guidelines indicate that a pneumonia immunization need only be taken one time to confer immunity to this disease, only slightly over half of the subjects indicated following CDC recommendations regarding pneumonia immunization (CDC, 1989). The percentage of elders in this study who had previously received an inoculation for protection against pneumonia was again higher than the estimated national average of 10% to 20% of all elders (Besdine, 1992; Catalana, 1992; Eickhoff et al., 1992; Tobacman, 1992). This difference also may be due to NPs' emphasis on prevention for this sample of elders.

Descriptive analysis was conducted on the questions indicating reasons for elders not receiving immunizations. The responses to the question concerning reasons for not receiving influenza immunizations were from 85 subjects, because only those elders who did not receive this inoculation last year were instructed to answer. The majority of the respondents ($n = 38$) indicated, "I did not think I needed it," while 19 responded they "had a reaction in the past to a flu shot," and 13 indicated that they "thought it would cause me to have flu symptoms." These responses are consistent with the findings from a study conducted by Christian in 1992 in which the most common reason given for not being immunized was the desire to avoid medications whenever possible (47%), followed by fear

of getting influenza from the vaccine (45%) and fear of adverse reactions (37%).

There were 151 subjects who responded to the statement, "If you have never had a shot to prevent pneumonia indicate the reasons." The most frequently cited response to this query was , "I did not think I needed it" ($n = 100$), followed by "Did not know there was a pneumonia shot" ($n = 24$). Eight individuals indicated that "My doctor or nurse practitioner didn't tell me I needed it." Write-in responses reflected similar thoughts, such as "Did not know there was a pneumonia shot, but got it today" and "Lack of information." These responses are consistent with conclusions made by Fedson (1994) that health care providers may fail to utilize opportunities to educate and immunize adults during clinic or office visits.

Research Hypotheses

The findings generated from this study indicated that there was a significant difference in immunizations between the control group and the three groups of elders with the various interventions. Analysis indicated that Group 4, which received the postcard reminder and received care from an NP who was exposed to the immunization fact sheet, was significantly different from all of the other groups. Elders in Group 4 received significantly more immunizations than those who received no intervention, or those who received a postcard reminder only, or those who received care from NPs who were exposed to fact sheets as a cue to increase awareness but did not receive a postcard reminder.

A combination of cues in the form of a postcard reminder for the patient and immunization fact sheets for the NP giving the primary care had the greatest effect on the immunization practices of elders. These findings are similar to the results of a study conducted by Leirer et al. in 1989 to determine if influenza immunization rates of elders could be improved through the use of various behavioral cues. Results of the Leirer and associates' study indicated that there was significantly increased participation in an influenza clinic when combined cues of voice mail and verbal announcements were utilized as well as a significant increase in participation when the voice mail cue was used alone.

Results from this research also were supported by the findings from a study conducted by Montano (1986) in which postcards were sent to all elderly clients at a Seattle clinic, reminding them of availability of the influenza immunization. Findings revealed that 17% of the patients were immunized who had previously indicated that they did not intend to receive the influenza inoculation.

Additional Findings

Data were additionally analyzed to determine if the behavioral cue interventions had an effect on elders who reported that they had not previously followed CDC immunization recommendations. This analysis was performed in an effort to separate those elders who had routinely obtained immunizations without any interventions and to focus instead on those individuals who had not responded to

usual methods utilized by health care providers to reach elders regarding immunizations.

Analysis revealed that there was a significant difference in the immunization practices of elders between the different groups who had not previously followed CDC guidelines. Post hoc analysis revealed that, of these subjects, the group of elders who received no intervention obtained significantly fewer immunizations than both those elders in the group who received care from the NPs exposed to the fact sheet cue and those who received care from the NPs exposed to the fact sheet cue and in addition received the postcard cue. Data analysis further revealed that, among this group of elders who had not previously followed CDC immunization guidelines, those who received the postcard only as a cue obtained significantly fewer immunizations than those who received care from the NPs who were exposed to the fact sheet cue. Additionally, those who received the postcard reminder as a cue received significantly fewer immunizations than those who received care from the NPs who received the fact sheet cue in addition to receiving the postcard cue. These findings suggest that, among groups of elders who do not follow recommended immunization guidelines, receiving care from NPs who have received an immunization fact sheet cue may significantly increase immunization rates. Findings also indicate that immunization rates may improve with the addition of a postcard reminder if elders are receiving care from NPs who have been exposed to a fact sheet cue.

Conceptual Framework

Two models provided the conceptual framework for this study. Neuman's (1989) Systems Model and the HBM (Leventhal & Cameron, 1987; Mullen et al., 1987; Rosenstock et al., 1988; Salazar, 1991) provided the structural basis that guided this research in relation to the clinical problem of immunization practices of elders.

The findings from this study support Neuman's Systems Model. In the Neuman Systems Model, the client/client system is in continuous interaction with nursing and the environment. The client's flexible lines of defense can be strengthened for protection from stressors such as disease. Additionally, according to Neuman (1989), prevention as intervention is a means of strengthening the flexible lines of defense. This study indicated that, if the client, who is continuously interacting with all elements in it's system, is exposed to interaction from nursing in which there is support to increase flexible lines of defense through immunizations, this means of prevention as intervention is likely to occur.

Findings from this study also support the HBM. According to this model, increasing cues to action is one method to trigger a response in an individual to undertake a health related behavior. Results from this study indicated that utilizing cues to action in the form of reminder postcards and fact sheets significantly increased a response in the immunization practices of elders.

Results from this research also support another concept from the HBM regarding the need for clients to perceive susceptibility in order to change health related behavior. A majority of elders in this study indicated no perceived susceptibility to pneumonia or influenza by the reasons given for not obtaining these immunizations. Most of the participants responded "no need" as the reason for not being immunized. Findings from this study indicated that, when NPs were made aware of elders' susceptibility to these diseases and the consequences of not being immunized through the use of fact sheets, they were able to significantly increase the immunization rates of elders who visited their clinics.

Conclusions

The following conclusions were derived from the findings of this study: (a) a majority of elders receive an influenza immunization on an annual basis; (b) the most frequently cited reasons for elders not receiving influenza inoculations are a belief that there was no need for the immunization, having a reaction to a previous flu injection, and fear of the inoculation causing flu symptoms; (c) only slightly over half of the elders have ever received an immunization against pneumonia; (d) the most frequently cited reasons for elders not receiving pneumonia inoculations are a belief that there was no need for the immunization, lack of knowledge that a pneumonia immunization existed, and primary health care providers not indicating a need for it; (e) behavioral cues of postcard

reminders and fact sheets, when used in combination, significantly increase immunizations among elders; (f) among elders who do not routinely follow immunization guidelines, receiving care from NPs who were exposed to fact sheet cues alone or in combination with postcard reminders significantly increased immunizations; (g) Neuman's Systems Model provides an appropriate framework for research regarding preventive interventions among elders; and (h) the HBM may be utilized as a framework to guide studies utilizing behavioral cues to impact elders' immunization practices.

Implications

Findings derived from this study have implications for nursing in the areas of research, clinical practice, and education. The results of this research cannot be generalized to all elders, however, data gleaned from the findings can add to the body of nursing knowledge.

NPs who provide primary care may be able to utilize the findings from this study in clinical practice. The practice of sending postcards to elders as a reminder to make an appointment to receive immunizations may be an effective strategy for NPs to pursue. Additionally, fact sheets for diseases preventable with inoculations could be developed and displayed as reminders to NPs working in primary care clinics. With the cost of health care escalating, any effective preventive intervention would be deemed useful not only in keeping elders healthy but also as an economic savings in terms of the expense incurred in

treating diseases preventable with immunizations. Because transportation appears to be a problem for rural elderly patients, nurses should be cognizant of any federal or private transportation programs within a region and inform elders about these programs. Additionally, NPs need to utilize every opportunity provided during elders' clinic visits to teach about immunizations and offer needed inoculations to these individuals.

Results from this study also should be beneficial to nursing education. Schools of nursing might incorporate the findings and recommendations from this study into curricula related to immunizations for elders. Findings from this study lend credence to emphasis on disease prevention content in schools of nursing. In graduate nursing programs that educate NPs, the concept of increasing cues to action for elders as a strategy to improve immunization practices could be taught.

Findings from this research might provide a framework for future studies regarding the immunization practices of elders. This study should provide useful data for a variety of studies regarding elder immunization practices. This primary study should serve as an impetus to further studies regarding elder immunization practices and related strategies to promote prevention of infection with either influenza, pneumonia, or both. Additionally, this study could provide a basis for studies related to cost savings of immunizations for elders in terms of expenditures as well as quality of life. Ultimately, such studies on this

important issue should benefit the American public in general.

Recommendations for Future Research

Recommendations for further research identified from the results of this study are as follows: (a) replicate this study utilizing a larger sample of culturally diverse elders in various geographic locations; (b) replicate this study in rural settings in which subjects are procured based on residency in the community rather than clinic affiliation; (c) replicate this study utilizing different behavioral cues, such as announcements in newspapers or public service announcements on the radio, as a trigger to improve immunization practices among elders; (d) conduct a correlational study that would relate immunization practices with demographic variables; (e) conduct a study to determine if any behavioral cues are more effective among certain age categories of elders; (f) conduct a study to determine if any behavioral cues are more effective strategies for either gender or race; (g) conduct a longitudinal study to determine if behavioral cues will continue to impact immunization practices of elders over time; and (h) conduct a study to determine NPs' use of and preference for types of behavioral cues.

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APPENDIX A
Immunization Survey

IMMUNIZATION SURVEY

1. When was the last time you had a flu shot? (check 1 response)

- Never
- More than 10 years ago
- 6-10 years ago
- 2-5 years ago
- Last year
- Unsure

2. If you have NEVER had a flu shot **OR** you **DID NOT RECEIVE** a flu shot within the **LAST YEAR**, -- What was the reason? (Check as many answers that apply)

- I did not think I needed it
 - Could not afford it
 - Was afraid of the pain
 - Had no transportation to get it
 - Did not know there was a flu shot
 - Had a reaction in the past to a flu shot
 - Thought it would cause me to have flu symptoms
 - My doctor or nurse practitioner didn't tell me I needed it
- Other: _____

3. When was the last time you had a shot to prevent pneumonia? (check 1 response)

- Never
- More than 10 years ago
- 6 - 10 years ago
- 2-5 years ago
- Last year
- Unsure

4. If you have a NEVER had a shot to prevent pneumonia indicate the reasons.
(check all that apply)

- I did not think I needed it
 - Could not afford it
 - Was afraid of the pain
 - Had no transportation to get it
 - Did not know there was a pneumonia shot
 - Had a reaction in the past to a pneumonia shot
 - Thought it would cause me to have pneumonia symptoms
 - My doctor or nurse practitioner didn't tell me I needed it
- Other: _____

APPENDIX B
Postcard Reminder

Postcard Reminder

The flu season will soon be here. NOW is the time to make an appointment at the _____ Clinic to receive a flu shot to protect you against this illness. It is recommended that persons aged 65 and older receive a flu shot every year in order to PREVENT serious illness.

It is also time to see if you need a shot to protect you against pneumonia. It is recommended that all persons aged 65 and over receive this immunization in order to prevent illness which could lead to hospitalization. Medicare will pay for both of these immunizations. Please CALL ____ - ____ today for an appointment.

THANK YOU

APPENDIX C
Fact Sheets

Fact Sheet on Immunization of Elders for Influenza

1. The incidence rate of influenza among elderly individuals is four times that of adults under the age of 40.
2. Approximately 22% of those elders affected with influenza develop complications severe enough to warrant hospitalization.
3. Influenza related disease accounts for 10,000 to 40,000 deaths a year in this country, of which 80% to 90% occur among elders. This disease is the fourth leading cause of death in elders.
4. Immunization reduces influenza related hospitalizations among community residing elders by 72% and reduces death by 87%.
5. Cost estimates of the economic impact of an influenza epidemic range from \$3 to \$12 billion annually.
6. Immunization saves approximately \$1 million per year in net medical costs associated with influenza.
7. It has been estimated that immunizing all elders against influenza would incur a net cost of only \$13 per year of healthy life gained.
8. Only 20% to 30% of all elders are immunized annually.
9. Nearly 80% of all Americans visit a health care provider at least once a year, with persons aged 65 and over visiting more often. Elders are more likely than younger patients to be influenced by a health care provider's recommendations for immunization.

Fact Sheet on Pneumonia Immunization for Elders

1. Pneumococcal pneumonia affects one half million individuals every year in the United States.
2. While pneumonia causes disease in 21 to 43 per 100,000 persons in the general population, it causes disease in 125 to 245 per 100,000 elderly persons.
3. Hospitalizations and deaths for elders with pneumonia have increased in the last decade. Pneumonia is the fifth leading cause of death in the United States, killing 40,000 individuals annually.
4. A single dose pneumococcal pneumonia vaccine that is effective against 23 of the most common strains of the known 83 types of pneumonia was introduced in 1983. These 23 types are responsible for 88% of all pneumonia infections.
5. The efficacy of the vaccine varies with age and the immune response of the individual ranging from 46% to 80%. It is considered 61% effective overall in elders.
6. The Immunization Practice Advisory Committee of the Public Health Service recommends vaccination for pneumonia for all persons aged 65 and over. The Nation's Health Objectives for the year 2000 call for a 60% pneumonia immunization rate for this high risk elderly population.
7. Only 10% to 15% of all elders have ever been immunized against pneumonia. Elders are unaware of the high risk of this disease for them. They trust health care providers to recommend immunizations if needed. Health care providers do not routinely assess the immunization status of elders.
8. The average cost of a hospitalization for pneumonia is \$9,448 if the individual had never been immunized for this disease. The average cost of a pneumonia admission to a hospital for a person who had been previously immunized is \$4,480. The average cost of a pneumonia vaccine given during a routine clinic visit is \$18.53.

APPENDIX D
Demographic Survey

DEMOGRAPHIC SURVEY

1. How old are you? _____
2. What is your sex?
 Female Male
3. What is your race?
 Black White
 _____ Other (specify)
4. What is the highest grade of school that you completed? (check only one)
 1st - 6th grade Graduated from Junior College
 7th - 8th grade Graduated from a 4 year College
 9th - 11th grade Completed some graduate courses
 Graduated from High School Received a Graduate Degree
 Completed some college courses
5. Where do you usually receive you health care? (check only one)
 Doctor's office Emergency Room
 Health Clinic At home from visiting nurse
 Public Health Department
 _____ Other (specify)
6. How do you pay for your medical care? (check all that apply)
 Medicare Cash
 Medicaid Charge expenses
 Private insurance Unable to pay
 _____ Other (specify)
7. Do you drive a car?
 Yes No
8. Do you live with someone who drives a car?
 Yes No
9. How would you rate your health? (check only one)
 Excellent Fair
 Good Poor

APPENDIX E
IRB Approval Form

UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM

Office of the Institutional Review Board for Human Use

FORM 4: IDENTIFICATION AND CERTIFICATION OF
RESEARCH PROJECTS INVOLVING HUMAN SUBJECTS

THE INSTITUTIONAL REVIEW BOARD (IRB) MUST COMPLETE THIS FORM FOR ALL APPLICATIONS FOR RESEARCH AND TRAINING GRANTS, PROGRAM PROJECT AND CENTER GRANTS, DEMONSTRATION GRANTS, FELLOWSHIPS, TRAINEESHIPS, AWARDS, AND OTHER PROPOSALS WHICH MIGHT INVOLVE THE USE OF HUMAN RESEARCH SUBJECTS INDEPENDENT OF SOURCE OF FUNDING.

THIS FORM DOES NOT APPLY TO APPLICATIONS FOR GRANTS LIMITED TO THE SUPPORT OF CONSTRUCTION, ALTERATIONS AND RENOVATIONS, OR RESEARCH RESOURCES.

PRINCIPAL INVESTIGATOR: LYNN CHILTON

PROJECT TITLE: IMMUNIZATION PRACTICES OF ELDERS

 1. THIS IS A TRAINING GRANT. EACH RESEARCH PROJECT INVOLVING HUMAN SUBJECTS PROPOSED BY TRAINEES MUST BE REVIEWED SEPARATELY BY THE INSTITUTIONAL REVIEW BOARD (IRB).

 X 2. THIS APPLICATION INCLUDES RESEARCH INVOLVING HUMAN SUBJECTS. THE IRB HAS REVIEWED AND APPROVED THIS APPLICATION ON 9-17-95 THE IN ACCORDANCE WITH UAB'S ASSURANCE APPROVED BY THE UNITED STATES PUBLIC HEALTH SERVICE. THE PROJECT WILL BE SUBJECT TO ANNUAL CONTINUING REVIEW AS PROVIDED IN THAT ASSURANCE.

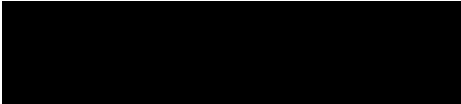
 X THIS PROJECT RECEIVED EXPEDITED REVIEW.

 THIS PROJECT RECEIVED FULL BOARD REVIEW.

 3. THIS APPLICATION MAY INCLUDE RESEARCH INVOLVING HUMAN SUBJECTS. REVIEW IS PENDING BY THE IRB AS PROVIDED BY UAB'S ASSURANCE. COMPLETION OF REVIEW WILL BE CERTIFIED BY ISSUANCE OF ANOTHER FORM 4 AS SOON AS POSSIBLE.

 4. EXEMPTION IS APPROVED BASED ON EXEMPTION CATEGORY NUMBER(S)

DATE: 9-17-95


RUSSELL CUNNINGHAM, M.D.
INTERIM CHAIRMAN OF THE
INSTITUTIONAL REVIEW BOARD

The University of Alabama at Birmingham
1170R Administration Building • 701 South 20th Street
Birmingham, Alabama 35294-0111 • (205) 934-3789 • FAX (205) 975-5077

APPENDIX F
Agency Consent Form

Agency Consent Form

I agree to allow Lynn Chilton to conduct research on immunization practices of elders at the _____ Clinic. I understand that participants will be asked to sign an informed consent form if they are willing to participate. I also understand that the study will be conducted during the months of October, November, and December of 1995.

NAME _____

TITLE _____

DATE _____

APPENDIX G
Consent Form

Consent Form

My name is Lynn Chilton and I am a Registered Nurse and a Certified Gerontological Nurse Practitioner. I am presently enrolled in a doctoral nursing program at the University of Alabama at Birmingham and am conducting a research study on immunizations for the elderly. The results of this study should help health care professionals provide better disease prevention services.

I would appreciate it if you would consent to participate in this study by filling out two brief questionnaires that will take approximately 5 minutes to complete. There are no identified risks for participation in this study. Your answers will remain anonymous and will not identify you in any way. Results of the study will be reported as group scores only. Your participation in this study is voluntary. Your care at this clinic will in no way be affected by your decision to participate or not participate. You are free to withdraw from the study at any time. There are no individual benefits for participation, however, health care providers should be able to provide better services to elders as a result of this research.

I appreciate you taking the time to complete these questionnaires. Please sign on the line below to indicate your consent to participate. Thank you very much.

NAME _____

DATE _____

GRADUATE SCHOOL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
DISSERTATION APPROVAL FORM

Name of Candidate Lynn L. Chilton

Major Subject Nursing Health Policy

Title of Dissertation The Influence of Behavioral Cues on

Immunization Practices of Elders

Dissertation Committee:



Chairman _____

Director of Graduate Program _____

Dean, UAB Graduate School _____

Date 9/27/96