Factors that influence why elderly receive influenza immunizations

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FACTORS THAT INFLUENCE WHY ELDERLY RECEIVE INFLUENZA IMMUNIZATIONS

by

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ABSTRACT

Factors That Influence Why Elderly Receive Influenza Immunizations

by

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The purpose of this study was to determine what variables influence elderly persons to obtain the recommended annual influenza immunization. The Health Belief Model provided the hypotheses that were tested in the comparative descriptive design study. The convenience sample (N = 339) consisted of two groups: those who received the influenza vaccination (n = 267) and those who did not receive the vaccination (n = 72). The questionnaire was designed from the Health Belief Model for influenza immunization. The five predictor variables: susceptibility, perceived severity and threat, perceived benefits and barriers, were significantly related to the outcome of receiving influenza immunization. Log regression found an 88 % correct groupings. The findings support the Health Belief Model as predictive for the older person’s outcome for influenza immunization. Further research should include longitudinal studies to compare year to year influenza immunization results to validate that the findings hold over time.
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CHAPTER 1

INTRODUCTION

Problem

The problem under study is the current low influenza immunization rate for persons sixty-five years and older. There is limited information on the elderly, who obtain or do not obtain the influenza vaccination even though this age group is at greatest risk for getting the flu and resulting in serious complications.

The lack of influenza immunization for the elderly is a problem. Approximately, 35 million persons sixty-five years and older are considered to be at high risk for complications of the influenza virus that results in 110,000 hospitalizations and 20,000 deaths in the United States (CDC, 2000c). It has been shown that the vaccine is cost effective in relation to immunize the elderly and the at risk population. Immunizations prevent or minimize the disease and in turn prevent complications, hospitalizations and death resulting from influenza (St.Pierre, 1996). The Immunization Practices Advisory Committee of the Centers for Disease Control and Prevention for the past 30 years has recommended an annual influenza vaccination for the elderly and chronically ill (Winslow & Jacobson, 1997). Support for the immunization for influenza and pneumonia has been issued from several prominent sources. The American Academy of Family Physicians (AAFP) has recommended reducing the age for receiving influenza
immunization to fifty years of age (Zimmerman, 1999). One of the primary goals of the health initiative, Healthy People 2000, is to reduce the number of infectious disease through immunization programs (Healthy People, 2000). One method to achieve this is to increase the percentage of elderly, who are immunized, from the current rate of 20% to 60% and to reduce the mortality of influenza from 9.1 per 100,000 to 7.3 per 100,000 (Reece, 1995). The Healthy People 2010 has increased the rate for influenza immunization from 60% to 90% (Healthy People 2010). The CDC estimates that 1,300 hospitalizations and 900 deaths could be prevented for each additional one million influenza immunizations given to persons sixty-five years and older (CDC, 2000c). In addition, the Public and Community Health Nurse's Consultant: A Health Promotion Guide recommends annual influenza immunization for all persons sixty-five years and older (Stanhope & Knollmueller, 1997).

Significance of the Study

Ten percent of the influenza cases result in 50% of the hospitalization rates which comprise, approximately, 75-80% of the deaths related to influenza (Bentley, 1992). Many influenza complications and death can be prevented with an annual influenza immunization. This is a simple and cost effective method of preventing influenza (CDC, 1999a).

In 1997, approximately 56.5% of the elderly population 65 years and older in Nevada received influenza vaccination which was an increase from 51.5% in 1995.
(CDC, 2000d). In the United States, including the District of Columbia, the percentage of persons 65 years and older who received the influenza vaccination ranged from a low rate of 54.3% in the District of Columbia to a high rate of 74.4% in the state of Colorado (CDC, 2000d). The problem is persons aged sixty-five years and older at risk population do not get immunized despite the availability of inexpensive and effective influenza immunizations (Richardson & Michocki, 1994).

Purpose

The purpose of this study was to determine what factors influence a person sixty-five years and older to receive influenza immunizations. Identification of the factors that influence the elderly to get immunized can be used to develop programs to increase the influenza immunization rates in this population.

Conclusion

Pneumonia is the sixth leading cause of death for persons sixty-five years and older making a low influenza vaccination rate for the elderly a major concern. One of the objectives for Healthy People 2000 and Healthy People 2010 is to raise awareness and increase the influenza immunization rate from 60% to 90% in the United States (Healthy People 2010, 2000). The purpose of this study was to determine what factors influence a person sixty-five years and older to receive influenza immunizations.
CHAPTER II

LITERATURE REVIEW

Introduction

There are limited studies on why the older population does or does not get influenza immunization despite the solid support for immunization in the literature for the effectiveness of the influenza immunization (Potter, et. al., 1997). To provide a broad understanding of what is involved in immunization rates studies, the impact of immunization rates for health care providers, nursing home residents, and findings from health promotion studies that included immunization rates for the elderly population are presented. A major consideration for healthcare provider influenza immunization is to prevent the transmission of the influenza virus to their patients, especially the elderly and high risk patients living in highly populated communities such as long term facilities and nursing homes (Zimmerman, 1999). Nursing homes are concerned with influenza immunization rates to avoid influenza outbreaks since their population usually consists of frail elderly residents (McArthur, et. al., 1995). Finally the focus of this study elders living independently in their community are presented. Research utilizing the Health Belief Model and limitations and deterrents to immunization are discussed.
Immunization Rates for Healthcare Providers

Immunization rates for healthcare providers is an important issue for several reasons. Primarily, for the promotion of the influenza immunization for their patients and the prevention of iaterogenic transmission of the influenza to patients in their care. The Advisory Committee for Immunization Practices (ACIP) considers healthcare providers as a priority group for annual influenza immunization (Weingarten, Riedinger, Bolton, Miles & Ault, 1989). The primary goal for employees should be the prevention of spreading the influenza virus to their patients during the incubation period or working while ill (Weingarten, et. al., 1989). Zimmerman (1999) states that healthcare providers are often a source of transmission of the virus to their chronically ill or long term care residents. Transmission of the influenza virus can be reduced with annual influenza immunization of the healthcare providers in long term facilities or chronic care facilities. Watanakunakorn, Ellis and Gemmel (1993) concluded that healthcare providers employed by a teaching hospital who have received the influenza immunization will continue to receive the annual immunization as they grew older.

Nichol and Hauge (1997) asked healthcare workers to answer a questionnaire mailed to all employees after the influenza immunizations were offered at a Veterans Administration, University affiliated hospital. The 38 % response rate showed the vaccine was obtained for the following reasons: to avoid illness, to protect the patients, it was convenient, and there was no cost to receive the vaccination. The vaccination rate of these employees was 61. 2%. The employees who did not obtain the vaccine cited the following reasons: concerns about side effects, inconvenient, disagreed with national
recommendations, no contact with high risk patients and dislike needles. The researcher noted that the results could include a bias by the employees who did not complete the questionnaires, and limits the generalizations of the results to other facilities.

Thomas, Winsted and Koontz (1993) presented an educational program one month prior to offering immunizations to employees at a long term care facility. The immunizations were given at a one day fair for all of the employees at the long-term care facility. At a later time the employees were given a post intervention survey regarding employee attitudes about immunizations. The immunization rate of employees improved from 8% to 46% which increased to a 54% the following year. The reasons the employees gave for not being immunized were: fear of adverse reactions, avoidance of medication, inconvenient times, or the belief that the influenza vaccination was not protective.

Immunization Rates for Nursing Home Residents

Nursing home residents, a subset of the elderly population, are of particular concern due to their unusually frail health status. Arden, Monto and Ohmit’s (1995) studied the vaccination policies for residents of eighty-three nursing homes in Michigan and they found 84.5% of the nursing homes required written consent prior to vaccination from the residents or family members. The highest influenza immunization rates were achieved at the small nursing homes requiring written consent, nursing homes who immunized with a verbal consents or where no consent was required for immunization had achieved an 86.1% vaccination rate. The researchers concluded the written consent was not statistically significant, although, the trend of decreased influenza immunization rates were noted. Nursing homes with a high vaccination rate and nursing homes with a
smaller resident population experienced the fewest influenza outbreaks. The researchers concluded that the residents had a limited exposure from other residents, visitors and nursing home personnel to the influenza virus. In contrast, when there is direct and repeated exposure to the influenza virus, nursing home residents are at greater risk for infections (Potter, et. al., 1997).

Bergman-Evans (1997) compared women nursing home residents, N = 130 to women in the community using a secondary analysis of National Health Survey-Health Promotion and Disease Prevention Supplement (NHIS) weighted data. The nursing home residents data were obtained from chart reviews. Her research determined that 78.5 % of the nursing home residents received their influenza vaccination as opposed to 20.4 % of the women in the community group. The rates of illness from influenza were not compared between the nursing home women residents with the NHIS data.

McArthur, Simor, Campbell and McGeer (1995) used telephone surveys and mailed questionnaires to Canadian long-term care facilities. The researchers achieved an 84% response rate with an N = 1,520. The overall influenza vaccination rate for the elderly residents was 78.5 %. The influenza vaccination rate was higher in the province where the government paid for the vaccine for the residents as well as the staff. The Canadian legislation does not require the influenza vaccination for residents in the long-term care facilities. No data or discussions addressed the relationship of influenza and morbidity and mortality in the Canadian provinces.

In the United Kingdom, Potter, Stott, Roberts, Elder, O’Donnell, Knight and Carman (1997) reported 61 % of the healthcare workers were immunized. The researchers concluded the influenza vaccination of the healthcare workers reduced the
patient mortality from 17% to 10%. Potter et. al., (1997) concluded that vaccination of frail elderly in long term care facilities did not significantly reduce the patient mortality rate. Approximately less than one third of the frail elderly failed to seroconvert after receiving the immunization (CDC, 1999a). The frail elderly do not obtain the highest immunologic protection as a result of their impaired immune response (Potter, et. al., 1997). This seems to support the importance of prevention of transmission from others especially healthcare providers in the facility. In 1996, influenza and pneumonia cause 75,000 deaths for persons sixty-five years and older (CDC, 2000d). Clinics, long-term care facilities, public health and healthcare providers should continue to promote influenza immunizations for the elderly (McArthur et al., 1995).

Immunization Rates for Elders

Most of the studies on elders living in the community that include the influenza immunization have been associated with health promotion research. Fried, Rosenberg and Lipsitz (1995) used a health promotion and activity questionnaire. Results indicated that 95% of individuals over 65 to 75 age group were aware and more likely to obtain of the influenza immunization than the reference group.

Stehr-Green, Sprauer, Williams and Sullivan (1990) telephoned persons sixty-five years and older and used the Behavior Risk Factor Surveillance System Survey to determine the predictors of vaccination behaviors. The researchers concluded the elders, who had a medical checkup were found to be the best predictor for receiving the influenza vaccination due to knowledge of the influenza immunization and accessibility to their healthcare services.
Duclos and Hatcher (1993) conducted a random telephone survey of persons living in the community and full time residents living in institutions in ten different provinces. In the survey, 44.8% of the persons sixty-five years and old had received the influenza immunization. The two most frequent reasons for persons to decline the influenza immunization was the participants believed they hardly ever get the flu and their fear of side effects. The researchers found the best approach to increase influenza immunization rates was to have the healthcare providers offer and to encourage their patients to get their flu shot.

**Deterrents to Immunization**

The barriers to receiving the influenza immunization have essentially remained constant in the literature reported during the past ten years and according to the CDC (1999b). Negative attitudes, myths and the lack of knowledge regarding the importance of receiving influenza immunizations, cost and physical access have been identified as barriers to obtaining vaccinations. Health care providers often fail to offer immunizations to their patients and also fail to track high risk patients (Reese, 1995). Often patients believe that they are in good health and are not at risk for the flu (van Essen, Kuyvenhoven & DeMelker, 1997a).

Other reasons for not receiving immunizations included the following: fear of side effects and needles, belief the vaccination is not effective, and allergies to egg proteins (Thomas et al., 1993). Additional reasons for persons not obtaining the influenza immunization: negative past personal experience with immunizations or had family members, who had a bad experience, persons just not wanting the vaccination, the belief...
that the immunization is unnecessary, persons that have never received an influenza vaccination, ill or missed appointments and the lack of time (Bottum et al., 1995). In addition to the above reasons, Watanakunakorn, et al., (1993) reported: previous poor experience with the influenza immunization, misinformation about the efficacy of the influenza immunization, lack of knowledge of the current recommendations for immunization, lack of time for immunization, not know it was free, and being ill at the time immunizations are also reasons for not obtaining the influenza vaccination.

Health Promotion Studies

Three studies were identified that focused on health promotion practices of the elderly and included the influenza immunization. Herman, Speroff and Cebul (1994) compared three approaches to increase immunization rates for the elderly at a public teaching hospital. The control group without intervention achieved an immunization rate of 41%. The patient education group received teaching and pamphlets and resulted in a 46% immunization rate. The third group, the prevention team had nursing support. A health maintenance flow sheet with a protocol for influenza immunization was given prior to the exam. The third group attained the highest influenza immunization rates, 55%.

In addition, it was found that physicians and 2nd and 3rd year residents believed that they offered the influenza vaccination more frequently than they actually did. In the survey, the 2nd and 3rd year residents responded that they offered the immunizations to 91.7% in their practice. However the review of records found the 2nd and 3rd year residents offered the influenza immunization only 23.7% to 25.5% of their patients.
The physicians were more realistic with their responses and believed that they offered influenza immunization to 51% of their patients. In reality the vaccination was recommended 27.2% to 29.6% of the time. The strongest predictor for the patient receiving the influenza immunization, 74%, was prior influenza immunization. The researchers were unable to determine which intervention from the prevention team was the most effective. The researchers concluded that the protocol for influenza immunization prior to the exam made the third group the most effective group for increasing the influenza rates. The CDC (1999b) highly recommends standing orders or protocols be utilized in practice sites stating when immunizations are to be given.

Fried, Rosenberg and Lipsitz (1995) using a research registry, requested persons sixty-five years and older to complete a health promotion and activity questionnaires and yeild a 83% response rate. The results indicated that in the 65 to 74 age group, 72% (n = 95) of the respondents were aware of the influenza immunization and were more likely to respond positively by obtaining the influenza immunization than the 65 to 74 reference age group. Russell (1996), in another telephone survey, concluded that self-report of risk factors for influenza is usually under-estimated by the persons aged 15 to 64 years of age. Persons with existing health problems who do not consider themselves to be a high risk are often identified by their physicians as high risk due to existing health problems for the influenza vaccination (Russell, 1996).

Stehr-Green, Sprauer, Williams and Sullivan (1990) telephoned persons sixty-five years and older and used the Behavior Risk Factor Surveillance System Survey to determine the predictors of vaccination behaviors. This nonrandom sample of 9,851 obtained a 99% response rate. All of the respondents knew their immunization status for
the past year and 32% of the respondents reported receiving the influenza immunization in the past year. The predictors associated with not receiving the influenza vaccination included the following: non-white race, obesity, lack of seat belt use, and tobacco use. Elders, who had a medical checkup in the past year, were two times more likely to obtain the influenza immunization than those who did not have a checkup the previous year. The elders, who had a medical checkup were found to be the best predictor for receiving the influenza vaccination due to knowledge of the influenza immunization and accessibility to their healthcare services.

Gyrokos, Tannenbaum, Abrahamowicz, Bedard, Carsley, Franco, Delage, Miller, Lamping and Grover (1994) conducted a multiple study review of Canadian and United States research. Between 1979 to 1991, sixty-two eligible studies were reviewed and twenty-four studies were analyzed. The researchers documented from the multiple study reviews that to increase immunization rates the following methods were effective: standing orders in hospitals and clinics, mail personalized reminder postcards, and healthcare provider’s reminder phone calls to the patients. Influenza and pneumonia are illnesses that are preventable by receiving the influenza immunization by persons sixty-five years and older (St.Pierre, 1996). These conclusions are in agreement with those found in the studies reviewed in this paper.

Specific Use of the Health Belief Model

The Health Belief Model was the basis for several studies for influenza immunization. The two earlier studies were done in the United States and the two more
recent studies were done in the Netherlands using the model in relation to why immunizations are obtained.

In the Netherlands, van Essen, Kuyvenhoven and DeMelker in (1997a) developed a tool based on the Health Belief Model. The study questionnaires were mailed at random to 30% of the patients who were vaccinated and all of their non-responding patients. The clinic patients who received invitations from their physician had an 84% vaccination rate. The study revealed that persons under 75 years of age were more likely not to be vaccinated than those 75 years and older. The reason most stated for not being vaccinated was the belief that the vaccine had possible side-effects. A belief of the person's good health was another reason not to be vaccinated. The primary care provider reminder postcard was cited as the most common reason for receiving the influenza vaccination (van Essen et al., 1997a).

Another study by van Essen et al. (1997b), identified high-risk patient characteristics that affected their decision to be vaccinated for influenza. The researchers response rate was 85% from the immunized patients and 69% from the non-immunized patients via the mailed questionnaires. They found people were more likely to be vaccinated if they perceived benefits as a lack of side effects from the vaccination, protection from illness and the belief of susceptibility to influenza. Approximately one third of the respondents reported getting the vaccination due to the reminder postcard from their healthcare provider. The socioeconomic variables or the persons' perception of their own health were not identified as influencing the behavior for vaccination. Persons younger than fifty years old and with the disbelief of complications of influenza were less likely to be vaccinated. Cost was another factor for not receiving the influenza vaccination.
vaccination. They also found that patients have consistent behavior from year to year regarding influenza vaccination.

Frank, Henderson and McMurray's (1985) results supported the Health Belief Model as a prediction of immunization behavior. Independent living elderly, \( N = 273 \), received reminder letters for their immunizations and then completed a follow-up questionnaire. A strong association between the personal belief in the influenza vaccine efficacy and an increased immunization rate was found. The results indicated that persons who declined the influenza immunization lacked a perceived threat or risk of vaccine reactions or side effects. The results also indicated that persons who received the influenza immunization perceived a threat from and susceptibility to influenza and they also believed the vaccination to be safe and effective.

In the United States, Larson, Bergman, Heidrich, Alvin and Schneeweiss (1982) utilized the Health Belief Model for influenza immunization research that included mailing reminder postcards as cues for vaccination for the patients. One group received a postcard that simply stated that the influenza vaccination was available. This group achieved a 25.0% vaccination rate. The second group received a postcard using the Health Belief Model to explain the importance and health benefits of obtaining the influenza immunization and obtained a 51.5% vaccination rate. The third group received a postcard which had a personal invitation and signature from the physician to call the nurse and schedule a time for the vaccination and resulted in a 41.0% vaccination rate. The control group had no postcard and had a 20.2% vaccination rate. The researchers concluded, that the Health Belief Model postcard and physician
recommendation for vaccination were effective measures to increase immunization rates and was 20% more effective than the other groups.

Conclusion

Despite the Healthy People 2000 and 2010 directives and programs to increase public awareness, immunization rates remain below the 60% to 90% goals established for the elderly. Many of the studies are non-randomized samples of surveys or self-report questionnaires which can not be verified and limits the generalization of the findings. The facilities that study immunizations vaccination rates are usually short termed and limited to one or two years in length. There is a lack of longitudinal studies to determine the effectiveness of the programs with continued improved immunization rates or maintenance of the achieved immunization rates. Essentially, immunization rates have remained low despite the knowledge of the known barriers to low immunization rates. Numerous research studies have documented these barriers, and the immunization rate for the influenza vaccine remain low for the elderly population. The Health Belief Model supports increasing influenza immunization rates and is an appropriate model for this study. This study will contribute to the knowledge base of why the elderly living independently in the community do or do not gain access to healthcare for their annual influenza immunization.
CHAPTER III

FRAMEWORK

Introduction

The Health Belief Model was used for this study's rational basis. The Health Belief Model has six components that are described in this chapter. A conceptual map illustrating the relationship between the five components is included. Independent, dependent and extraneous variables for this study are identified. Five hypotheses have been derived from the Health Belief Model to explain the likelihood of the elderly's action or inaction to obtain the influenza vaccination.

Health Belief Model

The Health Belief Model (H.B.M.) was initially developed in the 1950's and 1960's by a group of investigators in the Public Health Services. In the 1950's the Public Health Services focus was prevention and to identify reasons why people did not participate in health preventive programs. The model has slowly evolved over the past fifty years. The researchers included G. M. Hochbaum, S. S. Kegeles, H. Leventhal and I. M. Rosenstock who were all social psychologists (Rosenstock, 1974). The team worked independently and cooperatively and everyone contributed to the theory. The goal was to develop a theory that could be applied to other problems (Rosenstock, 1974).
The Health Belief Model states that the health preventive behavior must have the three factors occur simultaneously. First, the person must be motivated and have a concern or the issue is irrelevant. Next, the person must believe that he/she is susceptible to the health care issue. Finally, the person needs to believe that the following the health promotion behavior is beneficial and then results in decreasing the perceived barriers (Rosenstock, 1988).

Later the Health Belief Model evolved to include the predictor variable self-efficacy. Bandura’s Health Belief Model was considered a social learning theory, but has been renamed a social cognitive theory. The social cognitive theory states that behavior is explained by expectancies and incentives. Expectancies has two different aspects: environmental cues the sequencing of events, outcome expectation the consequences of one’s own action. Self efficacy is the ability to perform the necessary behavior. Incentives are described as the value placed on the outcome (Rosenstock, 1988).

The original Health Belief Model focused on preventive actions. By including self efficacy explicitly in the model and de-emphasizing the barrier variable, new venues for research, specific planning of health promotion programs and interventions for behavior modification for the person and their community are permitted (Rosenstock, 1988).

The Health Belief Model states that people will utilize preventive health programs if they believe that they are at risk for an illness and possible consequences or complications (Rosenstock, 1990). The Health Belief Model is a value expectancy theory and was formulated for health preventive care. The value is that the person wants to avoid illness or to get well. The expectancy is the person’s belief that the particular
health action or behavior is available to avoid or prevent illness. The primary focus of this model is the values or beliefs that motivates and/or inhibits health preventive practices (Rosenstock, 1990). The Health Belief Model is comprised of three aspects: the components, the relationship between the components and application of the Health Belief Model to public health issues (Rosenstock, 1990).

The model predicts that the individual’s perception of susceptibility to an illness and perceived complications of the illness and the perceived benefit of the influenza vaccination to avoid illness will determine the likelihood of action by that individual. The model proposes that there are two deterrents to health promotion behavior the individual’s perceived barriers and the individual’s belief that the influenza vaccination will result in avoiding influenza (Larson, et al., 1982). Health purposely was not defined in this model. It is unknown if behaviors by a healthy person has a motivating influence for cues of action for a given health prevention behavior or if the behavior occurs at random and without forethought. The Health Belief Model has an avoidance orientation toward disease. It is unknown if disease accounts for health prevention behaviors (Rosenstock, 1974). Refer to Figure 1 for the Health Belief Model diagram.

Research studies and the Health Belief Model

During the past fifty years the Health Belief Model has been used as a conceptual framework for the study of preventive health behavior. This model has been utilized in a variety of research studies to determine what motivates individuals to seek preventive health behavior practices and to identify potential barriers for seeking preventive health care (Rosenstock, 1990).
The following research has been summarized and they all utilized the Health Belief Model for the framework of their studies. Stout (1997) used the Health Belief Model for the basis for the study of the lack of prenatal care for low-income women. In another research study, the topic of ethnic differences in breast self-examination practices used the Health Belief Model (Foxall, Barron and Houfek, 1998). A study by Brez and Taylor (1997) used the Health Belief Model to assess teaching responses for adults with low literacy skills during hospitalization. Tingen, S. Weinrich, Boyd & M. Weinrich (1997) used the Health Belief Model to determine predictors of participation in prostate cancer screening. Sparks and Russell (1998) used the model to determine the efficacy, safety and administration of the varicella vaccine for pediatric patients. A study directly related to the Health Belief Model and influenza immunizations was done by Larson, Olsen, Cole & Shortell (1979), and Larson, Bergman, Heidrich, Alvin & Schneeweiss (1982). In the Netherlands, Van Essen, Kuyvenhoven and DeMelker (1997a) used the Health Belief Model as the basis in their study of the clinic patients, who received invitations from their physician to be vaccinated.

Health Belief Model Applied to this Study

The Health Belief Model includes the following variables: Individual perceptions of susceptibility, seriousness, benefits, barriers and cues to action for the person, which result in the likelihood of the health behavior. The susceptibility and severity together result in the threat. The threat with the perception of benefits minus the barriers enables the individual to decide which preventive health behavior should be chosen if any (Rosenstock, 1974). Adequate measure for the cues to action were not identified for this
study. Cues to action, and self efficacy were not been included in this study. The only modifying factor in this study was the demographic variables.

Study Variables

The independent variables were: (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, (d) perceived barriers, and (e) demographics. The dependent variable was the likelihood of receiving the influenza vaccination.

The extraneous variables included the seasonal residents, those who reside here only during the winter months and use this urban area as a home base and travel to many other areas throughout the year.

Conceptual and Operational Definitions

The following section provides the conceptual definitions of the five components of the Health Belief Model as derived from the Health Belief Model (Rosenstock, 1974). The operational definitions for each component immediately follows each conceptual definition.

1. Perceived Susceptibility: What individual’s perceive as their degree of risk for contracting a disease (Influenza). The degree of risk can range from no risk to a very high risk for contracting the disease (Rosenstock, 1974). Perceived Susceptibility is operationally defined as the individual’s perception or concern for contracting influenza and was obtained from responses to the question. “I am, in general, susceptible to influenza.” (van Essen, et al., 1997a).
2. Perceived Severity or Perceived Threat: This is the individual’s perceived risk for complications of having the disease including death (Rosenstock, 1974). Perceived Severity or Perceived Threat was operationally defined as the risk of complications of having influenza, such as pneumonia or death and was obtained from responses to the questions, “The complications associated with influenza could be dangerous for me.” and “I cannot possibly run the risk of catching influenza.” (van Essen, et al., 1997a).

3. Perceived Benefits: The extent to which an individual believes that participation in preventive health behaviors will prevent illness. The individual’s belief may range from no belief or total belief in the benefit of participation in health prevention behaviors (Rosenstock, 1974). Perceived Benefit is operationally defined as the belief that obtaining the influenza immunization will prevent illness and was obtained from responses to the question. “Influenza vaccination provides a good protection against influenza.” (van Essen, et al., 1997a).

4. Perceived Barriers: The individual does not participate in preventive health behaviors due to the perceived negative consequences of an activity (Rosenstock, 1990). Perceived Barriers are operationally defined as the lack of participation in preventive health behaviors (immunization), due to the negative aspects of the activity such as, pain, inconvenience, side effects and cost and is obtained from the responses to the question. “The influenza vaccination can make me sicker than the influenza itself.”(van Essen, et al., 1997a).

5. Other Variable: The other variable was primarily the motivational variable of the theory. The other variables are those that may influence the individual’s beliefs
regarding his/her perceptions of the perceived benefits of preventive health behaviors. The other variable was operationally defined as the responses to the specific questions regarding the following: gender, age, immunization status, marital status, level of education, occupation, income, regular physician, health care coverage and general state of health (Rosenstock, 1974).

Hypotheses

Based on the literature review and the Health Belief Model the following hypotheses were tested in this study.

Hypothesis 1: The greater the elderly’s perceived susceptibility to influenza the greater the likelihood of receiving the influenza vaccination.

Hypothesis 2: The greater the elderly’s perceived severity of influenza the greater the likelihood of receiving the influenza vaccination.

Hypothesis 3: The greater the elderly’s perceived threat of influenza the greater the likelihood of receiving the influenza vaccination.

Hypothesis 4: The greater the elderly’s perception of the benefits of avoiding influenza the greater the likelihood of receiving the influenza vaccination.

Hypothesis 5: The greater the elderly’s perception of the barriers for obtaining the influenza immunization the lower the likelihood of receiving the influenza vaccination.
Assumptions

The primary assumption for this study, was that individuals would accurately complete the survey. It was not possible to validate where and if the participants actually obtained the vaccination. However, it has been shown that most persons are as accurate as they can be in their responses (Burns & Grove, 1997).

Summary

The Health Belief Model provides the framework for this research study. The conceptual diagram, Figure 1 shows the relationships between the components of the Health Belief Model. Figure 2 shows the application of the model for this study and the variables that predict the outcome of obtaining the influenza immunization. The operational definitions were listed with the conceptual definitions. The identified extraneous variables were also discussed. The five hypotheses were derived from the Health Belief Model to explain the likelihood of the elderly's action or inaction to access health care to receive the influenza vaccination.
CHAPTER IV

METHODOLOGY

Introduction

This chapter describes the research design, sample population, data collection procedures, ethical considerations and statistical procedures utilized in this research study.

Design

This study used a comparative descriptive design. There was no intervention, treatment or pre and post tests involved. The elderly population who received their influenza immunizations were compared to the elderly population who had chosen not to be vaccinated.

Sample Population

A convenience sample was taken from the accessible population of persons 65 years and older who resided in a large urban area. All of the participants indicated that they could read and speak English. The sample did not include residents of acute care facilities or long term facilities. The target population was individuals, 65 years and older who read and write English, and live independently in a large urban area. The accessible sample population was individuals, 65 years and older who attend senior
recreational activities, senior meal sites and senior social meetings. The sample was obtained from the multiple senior sites for data collection to increase the possibility that the accessible population would be similar to the target population.

Site Selection

Data were collected in a large urban area at multiple senior citizen groups, clubs and organization with various and diverse purposes and interests. The researcher contacted the presidents of each organization to obtain permission to distribute the questionnaires. The participants as a group completed the questionnaires before the meetings. The sites that were chosen had monthly meetings. The fourteen sites included a senior travel group, retired military, retired federal employees, senior community centers for various group meetings, senior meal sites, senior games competition and the senior extension group at the local university. Groups from different city areas and different social economic levels were used to provide a sample that would be representative of the elderly population of the overall urban area.

Method

After identifying persons at the various sites who were willing to participate in the study, the researcher asked each person if they had received the influenza vaccination in the influenza season 1998-1999 to determine which questionnaire they would receive. Each participant, who received influenza vaccination in the winter season 1998, received a “taker questionnaire.” Persons who did not receive the influenza immunization received a “non-taker questionnaire.” The completed questionnaires were placed in an unmarked envelope area returned to the researcher.
Data Collection Tool

The data were obtained through a questionnaire developed by van Essen et al. (1997a) and was used in a previous research study. The questionnaire was based on the health belief model with one question per component. The authors did not report reliability or validity of the tool (van Essen, et al., 1997a). For this study, nine questionnaires were distributed to a group of persons to assess the readability of the questionnaires and determine the test-retest reliability of the tool. A Paired t-test were calculated. The perceived susceptibility results were $t = .00$, $df = 8$, $p = 1.00$. The mean difference score was 0.00. The perceived severity results were $t = -1.41$, $df = 8$, $p = .195$. The mean difference score was -.33. The perceived threat results were $t = -1.41$, $df = 8$, $p = .195$. The mean difference score was -.33. The perceived benefits of action results were $t = -.61$, $df = 8$, $p = .559$. The mean difference score was -.22. The perceived barriers of action results were $t = -1.00$, $df = 7$, $p = .351$. The mean difference score was -.13. The test-retest supports the reliability of the tool.

Data Collection

Data collection for this research study began in August of 1999 and was completed in October of 1999. Data collection was eight weeks in length. This time frame was chosen to coincide with the vaccination season. Senior centers were visited during the influenza vaccination season to gain greater access the elderly population. A power analysis was done to determine the number of questionnaires were needed to reduce the risk of a Type II error. The calculations showed 30 to 60 questionnaires needed per group. Five to ten participants per variable is recommended for most statistical analyses (Burns & Grove, 1997). This study had five variables and the goal of 120 completed questionnaires for each group. A total of 339 completed questionnaires was obtained.
with 265 of the participants having received the influenza immunization. Only 74 of the participants did not receive the influenza immunization. The needed 120 completed questionnaires for non-takers was not met.

Ethical Considerations

This research study protocol was approved by the University of Nevada, Las Vegas, Department of Nursing and University of Nevada, Las Vegas Human Subject Right committees. The participants agreed to voluntarily compete the questionnaire. Confidentiality was assured to the participants. Participants who chose not to participate were thanked for their time.

Statistical Procedures

The Health Belief Model questionnaire (van Essen et. al., 1997a) provided nominal and ordinal type data. The sample was described using descriptive analysis procedures. Nonparametric or parametric tests were performed for each hypotheses. Each of the five hypotheses were tested and findings were reported separately. All statistical computations used SPSS 10.0 Graduate Statistical Program.

Summary

This study utilized a comparative descriptive design with a convenience sample obtained from multiple senior sites in a large urban area in the southwest. A questionnaire developed from the Health Belief Model was used for the data collection. The statistical procedures included descriptive statistics for the demographic data of the sample and separate correlation analyses for each hypotheses.
CHAPTER V

RESULTS

Introduction

This chapter explains and describes the data analysis process and presents the results.

Sample Description

The total sample was 339 from a possible 580 participants for a 58.4 % response rate. The mean age was 72 years, and was relatively evenly divided between men (n = 156, 46 %) and women (n = 183, 54 %). The majority of the respondents were married (61 %). The level of education of the group was 34 % college graduates, 27 % some college background, and 21 % high school graduates. Seventy-five percent of the group was retired with remainder of the respondents providing multiple answers, such as retired and volunteer at 6 %. The income was $30,001 to $60,000 for 28 % and $15,001 to $30,000 for 23 %. About one fourth (24 %) of the respondents did not answer this question. The sample is described in detail in Tables 1, 2 and 3.

In response to what is your health coverage 25 % indicated HMO insurance, 21 % had a combination of Medicare and insurance, and 20 % had both Medicare and Medicaid. Three hundred-five (90 %) respondents indicated they had a regular healthcare provider and 73 % had seen their healthcare provider in the past three months.
The health care provider had recommended the influenza immunization to 63% (N = 339) of the sample respondents, 78% (n = 265) of this sample who received the influenza immunization reported it was recommended by their healthcare provider as seen on Table 1. Therefore 25% of the sample sought the influenza immunization on their own without a recommendation. Location was another factor when obtaining the influenza immunization, with 45% of the sample receiving the influenza immunization because it was close to home. Of the sample 36% received their influenza immunization at the doctor's office. Of the remainder of the sample who did not obtain the influenza immunization, 21% (n = 74) reported the influenza immunization had been recommended by their healthcare provider.

Sample Population Comparison to the County Population

The sample was compared to the 1990 United States Census Bureau for Clark County. The (1990) census information was the most current information available. The sample population was only compared to Southern Nevada or Clark County and not the entire state. The census data is ten years old and may not be truly representative for Clark County's population at the time this research was completed. Clark County has experienced tremendous growth in the past ten years. There were 77,678 persons sixty-five years and older living in Clark County in 1990. This accounts for 11.3% of the general population. Of the sixty-five and older population the largest age group was the 65 to 69 years old with 31,241 persons or 40% of the older group. The mean age of the participants of this study was 72 years. In Clark County the annual income was $15,000 to $24,999 for persons aged 65 to 75 years. In this study the average income range was $30,001 to $60,000. The level of education was described for the general population and
not available per specified age groups. The sample for this study was slightly older and had a higher annual income than the Clark County population.

Hypotheses Testing Results

Results related to each hypothesis are presented separately. The hypotheses were tested using Spearman’s rho because of the nominal and ordinal levels of the data for dependent and independent variables. Refer to Table 4 and Figure 2 for details.

Hypothesis 1: The elderly’s perceived susceptibility to illness will increase the likelihood of receiving the influenza vaccination. The influenza vaccination data were ordinal and the dependent variable data were nominal. The result of the perceived susceptibility with Spearman’s rho analysis was \( r = .29, df = 321, p = .000 \). This result supports the rejection of the null hypothesis. It needs to be noted the \( r^2 = .08 \), an indicator of low clinical significance. The Research Hypothesis 1 is accepted.

Hypothesis 2: The elderly’s perceived severity of the illness will increase the likelihood of receiving the influenza vaccination. The perceived severity of the illness data was ordinal and the dependent variable data were nominal. The result of the perceived severity with Spearman’s rho analysis was \( r = .28, df = 326, p = .000 \). This result supports the rejection of the null hypothesis. It needs to be noted the \( r^2 = .07 \), an indicator of low clinical significance. Research Hypothesis 2 is accepted.

Hypothesis 3: The elderly’s perceived threat of illness will increase the likelihood of receiving the influenza vaccination. The perceived threat of illness data was ordinal and the dependent variable data were nominal. The result of the perceived threat with Spearman’s rho analysis was \( r = .40, df = 328, p = .000 \). This result supports the
rejection of the null hypothesis. It needs to be noted the $r^2 = .15$, an indicator of low clinical significance. Research Hypothesis 3 is accepted.

Hypothesis 4: The elderly's perception of the benefits of action will increase the likelihood of receiving the influenza vaccination. The benefits of action data were ordinal and the dependent variable data were nominal. The result of the benefits of action with Spearman's rho analysis was $r = .49$, df = 327, $p = .000$. This result supports the rejection of the null hypothesis. It needs to be noted $r^2 = .24$, indicator of significance. Research Hypothesis 4 is accepted.

Hypothesis 5: The elderly's perception of barriers for obtaining the influenza immunization will decrease the likelihood of receiving the vaccination. The perception of barriers data were ordinal and the dependent variable data were nominal. The result of the perceived barriers with Spearman's rho analysis was $r = .39$, df = 339, $p = .000$. This result supports the rejection of the null hypothesis. It needs to be noted the $r^2 = .11$, an indicator of low clinical significance. Research Hypothesis 5 is accepted.

In addition a logistic regression was used to estimate the likelihood of the person obtaining the influenza immunization based on the five Health Belief Model predictor variables. The regression was performed on the entire sample size ($N = 339$). The overall predictive model was statistically significant (model $\chi^2 = 149.69$, $p = .000$). Four of the predictor variables were significantly related to the likelihood of the person obtaining the influenza immunization: the elderly's perceived susceptibility, perceived threat of illness, perceived benefits of action and perception of barriers. The intra-correlation between perceived severity $r = .198$, $p = .431$ and perceived threat $r = .429$, $p = .074$ could be the reason that perceived severity was not significant and did
not enter the equation. The model was significant with an overall rate of correct classification of 88.1% in the analysis sample. Refer to Table 5 for specifics.

Summary

The sample was not comparable to the overall population over sixty-five in this urban area in the Southwest. The sample for this study was slightly older and had a higher annual income. The ethnicity of the sample population was not recorded, although they were primarily Caucasian. The Spearman’s rho correlations were statistically significant and all five of the research hypotheses were accepted and the null hypotheses were rejected. In testing the overall Health Belief Model using logistic regression four of the five predictor variables were statistically significant in predicting the outcome of obtaining the influenza vaccination.
CHAPTER VI

DISCUSSION

Introduction

This chapter discusses the major findings, identified limitations of the study, draws conclusions, and offers implication of the findings for health care providers, and recommendations for further research.

Presentation of Major Findings

The sample of 339 was not comparable to the geographical area from which the sample was drawn and consequently limits generalization. All of the predictors: perceived susceptibility, perceived severity, perceived threat of illness, the perception of benefits and the perception of barriers were significantly related to the health behavior of immunizations allowing rejection of the null hypotheses and acceptance of the research hypotheses. The logistical regression results demonstrated that four of the five predictor variables were statistically significant with 88% correct grouping. Perhaps the correlation between the predictor variables the perceived severity and the perceived threat was so high that the susceptibility of threat carried the correlation. The Health Belief Model was an appropriate framework for this study. Although a cue to action was not utilized in this study, 63% of the sample who had received the influenza
immunization had a healthcare provider recommend the influenza immunization. The Health Belief Model in previous research studies does support the increase of influenza immunization with the use of external cues such as reminder postcard (Larson, et al., 1982) or recommendation by the healthcare provider.

The influenza season, 2000-2001 had a shortage in production of the influenza vaccine and will be a unique year to study the impact of the anticipated and actual delay in distribution of the influenza vaccine. The shortage in the vaccine has forced physicians to refer their frail and high risk patients to supermarkets or drug stores for their influenza vaccination. Large orders of the vaccine have been sent to corporations for employee vaccination programs prior to shipments to physicians offices and have resulted in a delay of immunization for many high risk patients (Las Vegas Sun, 2000). Will the delay and shortages and the reduction in easy access to the vaccine impact future immunization rates and the Health Belief Model in predicting the outcome behavior?

Identifications of Limitations

The questionnaire had limitations in several areas. One limitation was the use of a five point likert scale instead of a four point likert scale. The neutral answer would have been deleted from the answers and the respondents would have been forced to chose a specific choice or answer. The neutral answer makes it impossible to accurately interpret the responses and basically resulted as a no answer. Also, the lack of published validity and reliability should be addressed in a future study. Several questions need to be added to the questionnaire. Questions asking about immunization in the prior year, number of years the person has been immunized and plans to be immunized next year should be included. The healthcare provider question should have specifically asked if the healthcare provider was a physician, physician assistant or a nurse practitioner. A
general question regarding the state of health was asked. A question if the person had a chronic disease such as diabetes, COPD or a cardiac condition should have also been included. The persons, who did not get the influenza immunization realize that the vaccine usually can be obtained for free from Medicaid, most HMO’s and insurance companies.

After reviewing the sample demographic descriptive statistics, the sample was not evenly distributed in regards of income, education, and the immunized group was twice as large then the non-immunized group in the survey. The ethnicity of the participants was not recorded and lacked a fair representation of the overall population. Therefore a bias could exist, since the persons not participating in the survey have unknown immunization status and could be different from the results of this survey. A bias could exist with the different levels of education and income. There could be a knowledge deficit or difference in priorities from the persons surveyed and the persons not surveyed. This study will not be able to be generalized to larger or different population because the sample was a study of one specific area and slightly different from the 1990 United States Census Bureau. The efficacy of the individual to obtain the influenza immunization was not measured in this research study and would have enhanced the efficacy findings in the research results.

The researcher did not have any access or resources to the respondents immunization status for verification.

Discussion of the Implications for Healthcare Providers

In this study 90 % of the sample population had a regular healthcare provider and 73 % of the sample had seen their healthcare provider in the past three months. The literature has had similar findings. Elders, who had a medical exam in the past year were
twice as likely to obtain a influenza than those who did not have a checkup in the previous year (Stehr-Green et. al., 1990). This study and other research studies have found one method to increase influenza immunizations is for the healthcare provider to recommend and encourage their patients to receive the influenza vaccine (Duclos & Hatcher 1993). Nurse Practitioners have a pivotal role to increase influenza immunization rates in their practice. The Health Belief Model framework is a good predictor and can be effectively utilized in predicting influenza immunization potential. The findings from the logistic regression significantly correlated the four predictive variables which were 88% for with the correct groupings. This study findings supports the findings by Larson, et. al., (1982) that a of the healthcare provider recommendation for influenza immunization is usually followed. However the impact on those who did not receive the recommended influenza immunization is unknown and needs to be identified in future studies. Ultimately the decision to immunize is the decision of the patient and their family with complete understanding of the purpose and benefits of the influenza immunization.

Recommendations for Further Research

Future research projects can follow the protocol of this study with some of the following recommended changes. The framework of the Health Belief Model was effective for this study. Measurement of the variable self efficacy would have been beneficial and contributed to the results. The questionnaire was satisfactory overall, however, demographic information regarding ethnicity and self efficacy need to be added. A question should have asked the sample if their healthcare provider was a physician, physicians assistant or a nurse practitioner. The sample should have been asked if they had a chronic disease like diabetes, COPD or a cardiac condition. A
possible barrier for the persons, who do not get the influenza immunization could be a
knowledge deficit regarding the cost of the vaccination. Informal peer counseling should
have been considered as a source of information for the elderly population. This could
also be a source of pertinent information and misconceptions regarding the influenza
immunization for the persons, who do not get the influenza vaccine. The questions
regarding colds could have been eliminated. The questionnaire was too time consuming
for this sample population and needs to be streamlined. Time was often cited as a reason
for not completing the questionnaire. Time constraints were also a common reason for
refusal of access to an organization to collect data. Informal peer counseling should have
been considered as a source of information for the elderly population.

This study focused on one influenza season (1999-2000) and it would be
beneficial to continue for another influenza season (2000-2001). A longitudinal time
frame of influenza seasons to compare the data from season to season is also
recommended. The 2000-2001 season should be studied to determine how the delay of
the distribution of the influenza vaccine, affects the immunization rates for the current
influenza season and the upcoming influenza season.

Conclusion

The influenza immunization rate for this sample almost met the Healthy People 2000
goal of 60%, but fails to meet the Healthy People 2010 goals of 90%. The sample size
of 339 is considered a moderately large sample size. However, the sample was not a
good representation of the Clark County population and consequently limits
generalization. The results of this study were consistent with previous studies. All of the
null hypotheses for the predictor variables: perceived susceptibility, perceived severity,
perceived threat of illness, the perception of benefits and the perception of barriers were
rejected and allowed acceptance of the research hypotheses. The logistical regression results demonstrated that four of the five predictor variables were statistically significant with 88% correct grouping. The Health Belief Model was an appropriate framework for this study.
Figure 1. The Overall Health Behavior Model. The variables of total threat and expected outcome from behavior predicted the outcome.
Table 1  **Frequency Distributions of Sample Demographics N=339**

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<td>Seen HCP in past year</td>
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<td>Received influenza immunization</td>
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Table 2  Frequency Distributions of Sample Demographics
For Persons who Received the Influenza Immunization  N=265

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Table continues
Table 2  Frequency Distributions of Sample Demographics

For Persons who Received the Influenza Immunization

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Table 3  **Frequency Distributions of Sample Demographics for Persons who Did Not Receive the Influenza Immunization**

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<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age:</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>48</td>
<td>65</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Widow/widower</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>High School Graduates</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Some College</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>College Graduates</td>
<td>29</td>
<td>39</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>57</td>
<td>77</td>
</tr>
<tr>
<td>Retired and Volunteer Work</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Homemaker</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Table continues
Table 3  Frequency Distributions of Sample Demographics for Persons who Did Not Receive the Influenza Immunization

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $15,000</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>$15,001-30,000</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>$30,001-60,000</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Payment Coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Medicare+Medicaid</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Medicare+Supplement</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>HMO</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>Healthcare Provider (HCP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular HCP</td>
<td>58</td>
<td>78</td>
</tr>
<tr>
<td>Seen HCP in past 3 months</td>
<td>43</td>
<td>58</td>
</tr>
<tr>
<td>Seen HCP in past 6 months</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>Seen HCP in past year</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>HCP recommended influenza immunization</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Refused influenza immunization</td>
<td>74</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 4  Spearman’s rho Comparing Model Predictor Variables to the Outcome of the Likelihood of Receiving the Influenza Immunization

<table>
<thead>
<tr>
<th>Variables</th>
<th>Spearman’s rho</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Perceived susceptibility</td>
<td>321</td>
</tr>
<tr>
<td>Perceived severity</td>
<td>326</td>
</tr>
<tr>
<td>Perceived threat of illness</td>
<td>328</td>
</tr>
<tr>
<td>Benefits of Action</td>
<td>327</td>
</tr>
<tr>
<td>Perception of Barriers</td>
<td>339</td>
</tr>
</tbody>
</table>

**Correlation is significant at the .000 level (2-tailed)**

* Clinical significance based on Burns & Grove (1997)
TOTAL THREAT

Susceptible to influenza
\( r = .28, \text{df} = 8, p = .000 \)

Perceived Severity
\( r = .27, \text{df} = 3, p = .000 \)

Perceived Threat
\( r = .38, \text{df} = 2, p = .000 \)

EXPECTED OUTCOME
FROM BEHAVIOR

Perceived Benefits of Action
\( r = .49, \text{df} = 2, p = .000 \)

Perceived Barriers of Action
\( r = .33, \text{df} = 0, p = .000 \)

OUTCOME

Person received influenza immunization
\( r = .33, \text{df} = 3, p = .000 \)

\( r = .39 \)
\( \text{df} = 0 \)
\( p = .000 \)

Figure 2 The Overall Health Behavior Model. Variables Threat and Expected Outcome From Behavior to predict the outcome.
Table 5  **Logistic Regression Results for the Predictor Variables**

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>b</th>
<th>Wald</th>
<th>Sig.</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived susceptibility</td>
<td>1.02</td>
<td>19.14</td>
<td>.000</td>
<td>2.78</td>
</tr>
<tr>
<td>Perceived severity</td>
<td>0.08</td>
<td>.10</td>
<td>.760</td>
<td>1.08</td>
</tr>
<tr>
<td>Perceived threat of illness</td>
<td>0.06</td>
<td>6.49</td>
<td>.010</td>
<td>1.83</td>
</tr>
<tr>
<td>Perceived benefits of action</td>
<td>1.00</td>
<td>14.06</td>
<td>.000</td>
<td>2.73</td>
</tr>
<tr>
<td>Perception of barriers</td>
<td>1.32</td>
<td>31.36</td>
<td>.000</td>
<td>3.73</td>
</tr>
<tr>
<td>Constant</td>
<td>-11.84</td>
<td>55.01</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>-2 Log Likelihood</td>
<td>186.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Chi-square (df=5)</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall rate of correct classification</td>
<td>88.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A

HUMAN SUBJECT APPROVAL
May 5, 1999

Ms Lynn Ferebee & Margaret Louis
Department of Nursing
4505 S. Maryland Parkway
Las Vegas NV 89154

Dear Ms Ferebee & Dr. Louis:

The Department of Nursing Human Subjects Rights Committee met and approved your proposal "Factors that influence why elderly receive influenza immunizations".

The next step is to take your proposal to Office of Sponsored Programs at UNLV for their approval before beginning further implementation of the project.

The Committee wishes you well in completing it.

If you make any major change in your project please notify the Committee.

Sincerely,

Susan Michael
Acting Chairperson
Human Subjects Rights Committee
Department of Nursing, UNLV
DATE: May 11, 1999

TO: Lynn Marie Ferebee
    Department of Nursing
    M/S 3018

FROM: Dr. William E. Schulze, Director
      Office of Sponsored Programs (X1357)

RE: Status of Human Subject Protocol Entitled:
    "Factors That Influence Why the Elderly Receive
     Their Influenza Immunizations"

OSP #S01s00599-041e

The protocol for the project referenced above has been reviewed by the Office of Sponsored Programs and it has been determined that it meets the criteria for exemption from full review by the UNLV human subjects Institutional Review Board. This protocol is approved for a period of one year from the date of this notification and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

If you have any questions regarding this information, please contact Marsha Green in the Office of Sponsored Programs at 895-1357.

cc: M. Louis (NUR-3018)
    OSP File

Office of Sponsored Programs
4505 Maryland Parkway • Box 451037 • Las Vegas, Nevada 89154-1037
(702) 895-1357 • FAX (702) 895-4242

51
Dear Ms Ferebee,

Hereby I fax you the translated parts of my questionnaire used in the mentioned study. The items regard the used variables in the analysis. I asked other questions, which did not have any relation to the outcome. The questionnaire was in the Dutch language.

Two other articles from my thesis were published in the (american) Archives of family medicine and in the British Journal of General practice 1997.

Of course you are free to use my questionnaire. If you have any other question, please contact me by email.

Yours sincerely,

Ted van Essen
Dear Lynn Ferebee,

Sorry for my late reply. I cannot help you with your question about the validity and reliability for the questionnaire, since we did not calculate this. About the validity: we tried to stay as close as possible to the real conduct and assumed that therefore the validity was good enough. About the reliability: we only asked one question per item, so we could not calculate an alpha over the answers. I do not have a copy of our research study in English. The only material I have is in the articles.

Sorry I cannot help you further on this. Any other question, please try again (and use my email address GAvEssen@knmg.nl as you did before, instead of the one I use in this reply).

Ted van Essen
REFERENCES


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VITA

Graduate College
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Lynn Marie Ferebee

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Las Vegas, NV 89154

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Bachelor of Science, Nursing, 1983
University of Nebraska, Lincoln

Thesis Title: Factors That Influence Why The Elderly Receive Influenza Immunizations

Thesis Examination Committee:
Chairperson, Dr. Margaret Louis, Ph.D., R.N.
Committee Member, Dr. Rosemary Witt, Ph.D., R.N.
Committee Member, Pat Alpert, R.N.-C, APN, MSN, MPH
Graduate Faculty Representative, Dr. Ann McDonough, Ph.D.