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# Improving Seasonal Influenza Vaccine Uptake Among Health Care Workers

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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MSN, ARNP, Florida International University, 1998

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Project Submitted in Partial Fulfillment

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Doctor of Nursing Practice

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Abstract

Yearly influenza (flu) immunization rates for hospital healthcare workers (HCW) continue to be lower than those suggested by the Centers for Disease Control and the World Health Organization. Vaccination is considered a valuable step in the process to protect patients against influenza infection. The goal of Healthy People 2020, and most hospital administrators, is that 90% of HCWs are being immunized. The objectives for this systematic literature review were to identify best practice recommendations for improving the vaccine rate among HCWs. The Cochrane methodology framed this systematic review, and Fineout-Overholt's and Melnyk's levels of evidence were used to evaluate the reliability of information and effectiveness of their interventions. Twenty articles that met the inclusion criteria (HCWs with direct patient contact, published between 2009-2016, and written in English) were reviewed. Eight articles met Melnyk's criteria for evidence Levels 5 to 7, 8 articles met the criteria for Levels 3 to 4, 2 articles were Level 2, and 2 articles were systematic reviews of randomized controlled trials (Level 1). The major influencer for accepting the flu vaccine was for self-protection; the leading deterrent for receiving the flu vaccine was unbelief and questions about effectiveness. Best practice strategies to increase vaccination rates among HCWs include understanding cultural beliefs, practices, and diversities. Involvement of leadership will direct changes through future policy development. The impact of a progressive flu vaccine campaign can effectively promote social change when health care workers' concerns are addressed and vaccination rates improve. Together, quality of care for patients may also improve.

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# Dedication

I would like to express my gratitude first to God for giving me the ability of endurance to finish my ambition and goal of completing my doctorate degree. I would also like to say a special thank you to my mother, Josephine Gray, whose encouragement, love, and devotion has been a tower of strength and support. To my father, Vincent Gray, for being available when I needed help. To my beautiful daughters, Rachel and Sarah, whose love, patience, and support have been encouraging even when I felt discouraged. Sarah, although you're 8 years old, your innocent words of wisdom was much appreciated. And now I can finally give the answer to your frequent question, "When are you finished? And what are you going to do with your DNP degree when you graduate?" Well Sarah, I'm done!

Rachel, I would like to say thank you for listening to me read over and over whatever section I was writing. I believe you're also an expert on information about the flu. Errol, thank you for getting me Wi-Fi accessibility to do my homework assignments when I had travelled to those remote Caribbean islands, much appreciated. To Marjorie Roache, for assisting me in the beginning of my project. To my colleagues and friends who have been supportive.

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Section 1: Nature of the Project

## Introduction

Influenza (the flu) is an extremely contagious acute viral infection easily transferred from one person to the next; close to 40,000 people die of the flu each year in the United States (Centers for Disease Control [CDC], 2011). The flu is a contagious viral infection attacking the nose, throat, and lungs. The transmission of the infection is transferred through droplets in the air from sneezing, coughing, or touching contaminated objects (CDC, 2014; Erkin & Ozsoy, 2012). According to the National Vaccine Advisory Committee (2012), more than 200,000 people are hospitalized for the respiratory illness and heart-related conditions associated with the seasonal influenza annually. However, influenza can be prevented by health care workers being vaccinated. The vaccination protects health care workers. Lindley et al. (2011) suggested that "vaccination against vaccine-preventable diseases can protect health care workers from acquiring and directly or indirectly transmitting potentially fatal illnesses to patients" (p. 391).

Hollmeyer, Hayden, Mounts, and Buchholz (2013) suggested that an effective way to prevent the flu virus among health care workers (HCWs) and to protect those who are being served by the HCWs is to receive the flu vaccine. Developing mass immunizations enhance the quality of HCWs, providing protection to patients should start at the organizational level. This means that the policy makers at the organizational level should support interventions and programs for the HCWs to receive the vaccine. Researchers have suggested that HCWs being vaccinated against the flu is an effective method that prevents the spread of the flu virus. Some researchers have concluded that a

lack of immunization for the HCWs leads to high rates of hospital-acquired influenza that are confirmed in the laboratory among patients (Rakita, Hagar, Crome, & Lammert, 2010).

According to Burns and Grove (2009), "The ultimate goal of health care workers is to provide evidence-based care that promotes quality outcomes for patients, families, health care providers, allied health students, and the health care system" (p. 11). It often takes a team of expert researchers, health care professionals, policy makers, and consumers to synthesize the best research evidence for developing standardized guidelines for clinical practice (Burns & Grove, 2009).

The CDC and various health organizations have recommended the influenza vaccination of HCWs. Even though recommendations are given relating to the effectiveness of the flu vaccine, 44.8% of HCWs still avoid being vaccinated (Rakita et al., 2010). A lack of knowledge relating to the flu vaccine is identified as a contributing factor and contributes to the view that a lack of education is a barrier for vaccine rates among HCWs (Jennings & Burant, 2013). Multiple efforts have been adopted to increase these rates at individual medical centers; however, the results have been modestly successful (Rakita et al., 2010).

Avoiding harm to patients was conceived over 2,300 years ago, namely called the Hippocratic Corpus. This declaration exists today, and it is imperative that employee health educators have strategies that improves the quality of health care workers accepting the flu vaccine. By assuring hospital staff are immunized, the health system

can fulfill the Hippocratic Oath to protect patients from influenza risks while they are hospitalized.

## Problem Statement

The CDC (2016) reported that influenza is also considered a major cause of death in America; it is reported to be the eighth leading cause of death in the United States. The complications of the influenza virus can cause substantial morbidity and mortality worldwide. Although the majority of infections are described as being mild, some influenza virus infections can lead to fatal complications resulting in death (Music, 2012). Vaccination is vital in the prevention of the transmission of the flu from patients to HCWs. Lemaitre et al. (2009) reported that the risks of complications from the influenza virus are serious, and the presence of increased flu viruses leads to increased risk of death comorbidities.

According to research, by authors Babcock, Gemeinhart, Jones, Dunagan, and Woeltjel (2010) suggest that vaccination against flu should be made mandatory at all organization levels, relating to health care workers both clinical and non-clinical who interact with patients. Campaigns that promote a mandatory influenza vaccine among health care works showed an increase with vaccination rates. Policy makers especially in the health industry should make policies mandating all HCWs have annual vaccination against seasonal influenza virus. At present, not all health care intuitions mandate that their employees should be vaccinated against the flu. The primary aim of nursing is to provide adequate care to their patients in order to promote positive outcome on their families, other HCWs, patients, and the health care system. The World Health

Organization (WHO; 2014) supports the use of vaccines as a safe and positive direction to prevent influenza and reduce the risk of outbreak of the pandemic influenza virus.

The health care organizations and the CDC (2013) in the United States claimed that it is essential to have flu vaccination amongst all HCWs. However, even with this significant recommendation, many health professionals have declined getting the vaccine. A goal of Healthy People 2020 involved promoting national campaign programs to increase the percentage rate to 90% of HCWs to receive the influenza vaccine, which is annually offered to combat against seasonal flu. The increased acceptance by HCW is projected to be accomplished by consistency with national programs and mandated regulations, policies, and laws (Healthy People 2020, 2013).

The benefits of annual influenza vaccination for the young as early as 6 months of age, the elderly, and especially HCWs has been supported by the Advisory Committee on Immunization Practices (ACIP; CDC, 2013). In a quotation from Stewart and Cox (2011), showing the significance for health care workers to be vaccinated against the flu virus, the authors Stewart and Cox stated the following:

> Health Care Workers Impact Patient Safety: HCWs who have direct contact with patients are the primary source of infectious disease outbreaks in health-care facilities. During an average season, 23% of HCWs are infected with the virus, show mild symptoms, and continue to work despite being infectious. Over the past 30 years, nosocomial influenza outbreaks have been documented throughout the United States and abroad. (Stewart & Cox, 2011, p.1)

## Purpose Statement

A systematic review of relevant literature involving the influenza vaccine uptake among HCWs and the relationship of the HCWs' perceptions and knowledge that cause resistance to being vaccinated against the flu vaccine was reviewed. Sources were used from both CINAHL and Medline databases. HCWs, especially baccalaureate nurses who are entering the nursing profession are educated on being proactive leaders in preventing potential global health problems (Whalen et al., 2014).

During the seasonal flu period, the employee health nurse in the hospital usually identifies the problem of HCWs resisting to accept the annual flu vaccine. In spite of the vaccine recommendations from the CDC (2013), vaccine rates have remained inconsistent. According to the National Vaccine Advisory Committee (NVAC, 2013), the focus for Healthy People 2020 is to achieve their target goal of 90% for all health care workers to receive the recommended influenza vaccine. Reaching the target goal would imply an ethical compliance for health care workers to voluntarily accept the recommended annual influenza vaccine (NVAC, 2013). The CDC indicated that the 2012 -2013 mid-season influenza vaccine uptake reached 63%, a positive direction towards achieving Healthy People goal for 2020, as compared to the prior rate of 36% (as cited in Quan, 2012).

The purpose of this quality improvement literature review is to assist the employee health nurse with information that is considered to be the best practice interventions for improving the influenza vaccination rates among HCWs at a government assisted hospital. Developing an action plan as a guide would assist the

employee health nurse with a practice that would communicate the process for implementing and improving flu vaccine rates among HCW with collaboration from infection control and managers within the hospital.

During the seasonal flu period, most hospital administrators without a mandatory hospital policy expect a high percentage of acceptance rate of HCWs acquiring the vaccine. Many institutions support the annual immunization of HCWs against influenza to reduce the risk of infection in the work place. Multiple international vaccination campaigns have subsequently tried to motivate HCWs to be vaccinated; however, they have been met with unexpected resistance (Hoffman, Ferracin, Marsh, & Dumas, 2006). Many programs and published journals have recorded both the triumphs and failures contributing to vaccination programs, as well as the beliefs and attitudes of HCWs regarding this issue.

HCWs are exposed to the flu virus through their involvement within the community and the work place. Misconceptions about the flu vaccine have also led to resistance in being vaccinated. According to a qualitative study with 190 nurses completed by Babcook et al. (2010), only 50% of the nurses who completed the questionnaire on nosocomial infection understood that being vaccinated could prevent them from transferring the infection to their patients. In a cross sectional study done by Lavela, Smith, Weaver, and Legro (2015), among over 1,000 health care workers, it was determined that the HCWs' vaccination rate was 51%. Lavela et al. indicated that HCWs aged over 50 accepted the flu vaccine, and the primary motivator was self-protection at 77%. Caplan (2011), indicated that globally health care workers have demonstrated

difficulty with being immunized against communicable diseases, the rates of influenza vaccination among health care workers has been evidenced to be less than 50%. Mandatory influenza vaccine has raised the rate to 80 – 85% from the previous rate of 30 -40% without a mandatory flu vaccine policy (Caplan, 2011). According to authors Zhang, While, Norman (2012) and Lavela, Smith, Weaver and Legro research showed that a major factor for receipt of the flu vaccine was the HCWs' attitudes and belief in the vaccine ($p < .001$). Other researchers investigated through literature review of health institutions with more than 1,000 health care respondents showed that the percentage rates of health care workers receiving flu vaccine range from 52% to 66%, a mark below the goal set by Healthy People 2020 for 90%.

Anikeeva, Braunack-Mayer, and Rogers (2009) referred to a study conducted in neonatal intensive care units in the United States and "found that influenza immunization compliance rates among staff ranged between 15% and 20% and that 76% of staff continued to care for patients despite reporting flu-like symptom" ( p.25).

Mandatory vaccination for influenza is a very important issue for health care organizations. Hollmeyer et al. (2013) suggested that the most effective way to prevent the HCWs as well as to protect those who are being served by the HCWs is to receive the vaccination for influenza. Mandating the vaccination at the organizational level has been found necessary in research. This means that the policy makers at the organizational level should make it mandatory for the HCWs to receive the vaccine in order to achieve the desired goal close to 90%.

An educational program will be implemented for employees halting between two opinions or refusing the flu vaccine. Evidence from literature has indicated that personal experiences, whether positive or negative, affect the decision making of HCWs and the outcome of their choice on the influenza vaccine. Since1984, the ACIP has advocated the advantages for HCWs to accept the flu vaccination. Although the rates of vaccination have been rising for HCWs, only 66% accept the seasonal vaccine (CDC, 2012). According to Kulczycki (2012), in the month of July 2012, the Joint Commission and Infection Control recommended that the flu vaccine be included as part of an organization's quality improvement plan. For hospitals to receive recognition relating to patient safety and to be identified as a facility promoting quality, HCWs are required to be vaccinated against the seasonal flu (Kulczycki, 2012). Hospitals achieved accreditation from the Joint Commission Accreditation for Hospital Organizations, which revealed the number of HCWs who accepted the flu vaccine. The results for quality improvement indicated the effectiveness for yearly scheduled immunizations influenced by campaign vaccination programs for all employees, including extenders for the hospital such as licensed independent practitioners and nonclinical staff visiting the hospital (Kulczycki, 2012).

The seasonal influenza vaccination program has been in effect since 2012, and part of the accreditation survey that started July 2012 includes hospitals reporting results of HCWs being vaccinated against the flu virus (Kulczyzki, 2012). From an executive viewpoint, it is the expectation for the mentioning of quality improvement to be set by the proposed health agencies. The involvement of the CDC and The Joint Commission

seemed promising to support the Healthy People vaccination priority goal to reach the expected 90% coverage by 2020. It is apparent that employee health is struggling with increasing the vaccination rate without a policy mandating HCWs be vaccinated against the seasonal flu virus. Request for information of best evidence-based practice (EBP) to improve rates are explored by a scholarly systematic review of literature that improves the quality of the flu vaccine uptake among HCWs. Improving the rates of vaccination against the flu virus is important to decrease the transmission of infection and serious illness that can be transferred from HCWs to patients and patients to HCWs.

## Project Objective

The primary objective, for this project, was to highlight the most prominent evidenced-based strategies from the literature review; therefore, a power point presentation was developed as an additional tool for the employee health nurse to provide information to HCWs on the value and benefits of being vaccinated against the influenza (flu) virus, and the consequences and risks due to the complications of the flu virus. According to the initial literature, the frequency of education is mentioned as an effective tool to improve the vaccination rates among HCWs during the seasonal flu period in the hospital. The goal of this project was to provide a presentation regarding the best EBP interventions reviewed through the literature that would improve the vaccination rates for HCWs in a hospital that does not have a mandatory flu vaccination policy. This tool provides information to educate HCWs, whose knowledge about the flu virus is limited. Identifying the barriers revealed by literature allows the employee health nurse to target the specific barriers and improve the flu vaccine acceptance rates among HCWs. The

review gives a perspective on the current vaccination program strengths, weaknesses, and opportunities to practice new interventions to increase the vaccine rate among HCWs. Different observational studies may conclude that a lack of immunization for the HCWs will lead to high rates of hospital-acquired influenza among patients (Rakita et al., 2010). As part of its accreditation, the Joint Commission and Accrediting Hospital Organization in 2007 required hospitals to improve quality by increasing the flu vaccine results, indicating to the community that patient safety is high.

## Significance of the Project

As a former occupational health nurse for a metropolitan healthcare organization, the job description and credo for the department is to maintain health and wellness for HCWs by providing a safe environment for both the staff and the patients. Immunization is considered the safest and most effective method of preventing influenza (Backer, 2006). However, with the rise in information regarding the benefits of the flu vaccine, many HCWs refuse to accept administration of the free vaccine.

With extensive research studies available promoting the benefits of the flu vaccine, it is alarming that HCWs refuse the vaccine unless they are pressured to comply due to hospital policies and regulations. My motivation for this systematic literature review is a passion for changing the mindset of HCWs whose perception of the flu vaccine is incorrect. Gathering information on strategies that would improve the flu vaccine uptake among HCWs and involving leadership in the campaign to influence or stress the importance of this preventable disease via vaccine is necessary to break the life cycle of inaccuracies and barriers towards the seasonal flu vaccine among HCWs. The

probability of understanding the health beliefs of HCWs is necessary to eliminate misconceptions by educating the HCW of the benefits of being vaccinated and by promoting quality improvement for the HCW and the patient.

According to the American Association of Colleges of Nursing (AACN; 2006), the DNP degree prepares students to address the most important skills needed to interpret three levels, such as the best evidence-based care into practice, improving systems of care, and measuring outcomes of groups of patients and communities. The scholarly role of the

> DNP graduate prepares the student to design, influence, and implement health care policies that frame health care financing, practice regulation, access, safety, quality, and efficacy. The DNP graduate is able to design, implement and advocate for health care policy that addresses issues of social justice and equity in health care. (AACN, 2006, P.13)

The goal of influencing HCWs is to change their health behavior to accepting the flu vaccine, thereby promoting the flu campaign and preventing transmission of the flu virus among health care worker, and patients.

The CDC, ACIP, and the Healthcare Infection Control Practices Advisory Committee recommend the benefits that are contributed when HCWs are vaccinated against the seasonal flu virus; therefore, governmental health agencies suggest that the majority of HCWs within the United States be immunized annually against the flu vaccine (CDC, 2013). Reasons for encouraging influenza immunization among HCWs are categorized; here are some of the rationales for the significance of being vaccinated:

A HCW with influenza can pass on the virus to another person a day before the initial signs and symptoms are visibly seen. HCWs will continue working with flulike signs and symptoms, especially if they are mild. Researchers have indicated numerous reasons as to why HCWs are not immunized against influenza (Black et al., 2015). The main reason is that there is a widespread perception that the influenza vaccine has numerous side effects, vaccine inefficacy, and an over-estimation of the risks of the vaccine. Hospitals that have mandated their employees be vaccinated have a high percentage rate of employees accepting the flu vaccine. In a study conducted by Black et al. (2015), they indicated the lowest coverage at 44% among HCWs working in assigned areas where employers did not mandate vaccinations, did not promote the flu vaccine campaign, or where the vaccine was made accessible for their employees by providing the vaccination on-site. The primary significance from the literature review relates to presenting an approach for educating the HCWs to understand their beliefs and to overcome barriers.

The benefits of EBP are improved outcomes for patients, providers, and health care workers (Burns & Grove, 2009). EBP is an intricate phenomenon that involves the combined integration of best research evidence with clinical expertise, patient expectations, and patient needs that are required for the delivery of quality, and cost-effective care. The CDC (2013) recommended multiple individual strategies of successful vaccine programs; however, a comprehensive methodology that uses a collection of strategies together may be most effective at increasing influenza vaccine among HCWs.

With previous experiences as an occupational health nurse practitioner in the hospital setting, the significance of educating and understanding the HCWs' perceptions

of the flu was extremely important to navigate and promote a social change that benefits the patient and the employee and increase productivity for management within the hospital arena.

In the systematic literature review, I identified the importance of being immunized. The CDC (2011) recommended that HCWs who are immunized help to decrease the spread of influenza by decreasing staff illness and absenteeism; the vaccine also provides protection in conjunction with assisting in the avoidance of influenza related illness and complications resulting in death, especially for people at increased risk for severe influenza illness.

## Gap in Practice

The National Vaccine Advisory Committee (NVAC; 2012) stated that influenza is a significant public health issue. TheNVAC (2011) reported

> that the annual influenza-associated deaths range from 3,000 to 49,000 according to recent estimates, and more than 200,000 people are hospitalized each year for respiratory illnesses and heart conditions associated with seasonal influenza infections. Immunization is the best method for preventing infection from influenza and possible hospitalization or death. (p.4)

To emphasize the gap in immunization rates for HCWs, the U.S. Department of Health and Human Services, "Assistant Secretary for Health (ASH) directed the National Vaccine Advisory Committee (NVAC)-made recommendations and strategies for the specific purpose of reaching the Healthy People 2020 coverage goal" (NVAC, 2011, p.1). The development of improving influenza infection prevention programs among HCWs

was established by the NVAC. The NVAC advises that a health organization establish a comprehensive influenza campaign program that includes education for HCWs as a significant component. It is critical to develop and generate flu strategy prevention plans that are important steps for all HCWs and health care agencies to achieve the goal for Healthy People 2020 influenza vaccine coverage goal (NVAC, 2011).

## Practice-Focused Questions

The systematic literature review explored the activities of hospital organizational initiatives by comparing what implementation was achieved to change and increase vaccine uptake among HCWs. The practiced-focused questions investigated through the literature are the following: What research has been completed regarding the interventions and effectiveness that the hospital used to improve HCW vaccination rates? What is the association between HCWs' beliefs, knowledge, and perceptions to improve the influenza vaccine uptake? What quality improvements are used in hospitals to improve the influenza vaccination uptake among healthcare providers? Does leadership involvement improve the flu vaccine rates among HCWs in a hospital setting?

## Possible Sources of Evidence

Participation in research is important for the advancement of nursing along with the development, improvement, and evaluation of treatment plans (McEwen & Wills, 2011). The genesis for recommending that all HCWs be vaccinated against the seasonal flu season occurred in 1981 by the CDC, yet only 40% of HCWs are vaccinated against influenza annually (CDC, 2011). The success of the outcome of this review was measured by the results of the literature review for the target population. McCurry,

Revell, and Roy (2009) stated that a nurse's "social mandate requires nurses to question existing care practices, test innovations in care, and engage in action research for the common good" (p. 43). According to public health agency (CDC) reports in the United States, more than 5,000 people die annually as a result of influenza and its related complications (Wood, 2011). More than 20,000 people are being hospitalized with influenza (Wood, 2011).

A plethora of literature indicates the value of leadership involvement, education, and understanding health belief practices of HCWs concerning the severity of their perception illness, the effectiveness of the vaccine, and its tolerance (Cohen & Casken, 2012; Prematunge et al., 2012). Benet et al. (2012) revealed the effectiveness and protection of the flu vaccine for the patients when HCWs who had direct patient care were vaccinated. The literature also showed the value of informative networking for public health institutions by the Global Influenza Hospital Surveillance Network in 2012 for the purpose of creating a database that collects epidemiology data for monitoring the effectiveness of the vaccine internationally and recording the results (Puig-Barbera et al., 2014).

## Definition of Terms

*Barrier*: Something immaterial that obstructs or impedes the positive or negative results about the vaccine. *Behavior*:An action that affects the efficacy of the influenza acceptance or delineation of the flu vaccine.

*Belief*: The mental act or habit of placing trust or confidence in the information received relating to what is perceived about the vaccine.

*Culture*: Culture is formed by values, beliefs, norms, and practices that are shared by members of the same cultural group. Cultural practices varies by various ethnic groups

*Healthy*: An experience that is often expressed in terms of wellness and illness and may occur in the presence or absence of injury.

*Health care worker (HCW)*: A HCW is someone who works in a hospital or health center.

*Influenza*: Influenza is one of the key leading causes of death in the United States. It is a respiratory contagious disease that spreads from one person to the other.

*Nurse*: Provides the protection to patients and provides health promotion and prevention of illness and injury. Responsible for being and advocate for clients.

*Understanding*: The ability to mentally process and interpret the message from another person.

## Aim of Project

In this project, I reviewed evidence in a systematic fashion relating to the effects of leadership involvement with increasing the vaccine uptake of HCWs and equally understanding the perception of barriers to immunization of the influenza vaccine. Exploring the best evidenced-based leadership style that would influence the acceptance of the flu vaccine among HCWs. Many studies have indicated evidence through the literature review that leadership involvement education of health beliefs is important to increase awareness of the benefits of the vaccine among HCWs.

## Assumptions and Limitations

This literature review provided me information to increase strategies that will encourage HCWs to be vaccinated against the seasonal flu vaccine and increase vaccination uptake among HCWs. I will be able to deliver the best evidenced-based practices to the staff employee health nurse in the form of a presentation that can be offered to HCWs to educate and inform them of the benefits and risks of not being vaccinated.

> Wicker and team reported that many studies demonstrate that the benefits of the influenza vaccination for health-care workers significantly decreases the morbidity and mortality in their patients. Official immunization recommendations and free, voluntary immunization programs for health-care workers have been in existence for many years. (Wicker et al., 2009, p. 567).

## Summary

This systematic review of the literature shows that the flu vaccine rates increase when leadership actively participates and is involved with the flu vaccine campaign. Understanding cultural health beliefs and promoting educational programs in conjunction with other strategies for improving the flu vaccination rates among HCWs with direct patient care increases quality improvement for patient safety. It is important that influenza vaccine programs stress the benefits of vaccination and underscore positive influencers that improves the vaccination rates, while identifying barriers to vaccination compliance to achieve maximum vaccine coverage among HCW populations (Prematunge et al., 2012).

Section 2: Review of Scholarly Literature and Theoretical Framework

## Introduction

According to Rosenstock, Stretcher, and Becker (1988), "The Health Belief Model (HBM) was originally developed in the 1950's by a group of social psychologists working for the U.S. Public Health Service who wanted to improve the public's use of preventive services" (as cited in McEwen & Wills, 2011, p. 290). Boskey (2010) suggested that the HBM is defined as a tool that predicts health behaviors, and it is informed by the theory that an individual's personal perception and understanding about a disease process will determine if they change their behaviors and follow health recommendations. The theoretical constructs of the model include four perceptions: perceived seriousness, perceived susceptibility, perceived barriers, and perceived benefits (Glanz, Rimer, & Lewis, 2002). The health belief model is a conceptual framework of health behavior that focuses on behavioral change at the individual level. The model implies that decisions the individuals make are based on an internal assessment in which they evaluate if they benefit them (Green & Murphy, 2014).

## Theoretical Framework

The health belief model (HBM) provides a theoretical framework for identifying factors that influence seasonal influenza vaccine compliance for HCWs. Understanding the cultural beliefs and interpreting the knowledge of the health care worker is needed to succeed. Through abstract thought, personal knowledge, and intuition, theories are developed by nurses, and theories are then tested through research to determine the

validity of the research project (Burns & Grove, 2009). A model that is used to describe an individual's use of preventative health measures is the HBM; this model gives researchers a framework in which to understand what lapses in understanding what the misconceptions are relating to immunizations. The HBM identifies four characteristics within its assessment: perceived seriousness about the disease, perceived susceptibility relating to ill-health, which is classified as a risk perception, perceived barriers to taking action, and perceived benefits of behavior change (Green & Murphy, 2014). New methodologies to health behavior change are critical for improvement. However, there has been an inadequate report of the-effectiveness of interventions in creating productive health choices that stimulate change for health behavior that is long term. Health professionals have had only insignificant success at assisting individuals to adopt and keep healthy lifestyles (Moore & Charvat, 2007).

Five potential barriers have been identified including: low perceived risk for influenza, vaccine safety concerns, low perceived effectiveness, recommendations from peers, and recommendations lacking from primary care providers (Thompson, McIntyre, Naleway, & Black, 2013). Based on these barriers, the educational component is an integral factor that needs to be included in the strategy for increasing awareness in many healthcare organizations today and also within the healthcare community as a whole. Educational efforts should focus on the HCWs' level of perception regarding the flu virus. Assessing and promoting the importance of being immunized through education for the HCW may be influential and beneficial with regard to increasing preventive behavior compliance and increasing the vaccination uptake with HCWs.

The HBM stresses the value of understanding health beliefs and perceptions about influenza vaccination in order to guide the choice of interventions for HCWs who are resistant or impervious to the influenza vaccine. The practice issue during this practicum project was to review the results of the literature regarding previous quality improvement by EBP to increase the influenza uptake among HCWs. Zhang, White, and Norman (2012) indicated that the fear of getting the flu increases vaccination rates. This is an indicator that perception can influence the HCWs' decision. According to Pitts, McArthur, Millar, Perl, and Segal (2014),

> Evidence from observational studies suggest that a mandate for health care workers The Advisory Committee on Immunization Practices (ACIP) recommends influenza vaccination for all healthcare personnel (HCP) to reduce transmission to vulnerable patients, and Healthy People 2020 calls for influenza vaccination of 90% of HCP in the U.S. by 2020. (p. 337)

## Literature Search Strategy

This systematic literature investigated the effectiveness of interventions used to improve the flu vaccine rate among HCWs. Searches were done by reviewing journals and articles found in the following databases: PubMed, CINAHL, and the Cochrane Library. The importance of being vaccinated with the flu vaccine is not only a professional, organizational, local state, national, and global issue, but a collective concern to educate both those in health care and those who have no health care affiliation because the flu virus has no boundaries on who it will infect. For example, on a state level, the Florida Department of Health (2015) continues to encourage residents to be

immunized against the flu virus as a preventative measure to reduce their risk of complications from flu. The WHO (2011) and the CDC (2012) have endorsed the promotion of the flu vaccine. The WHO has aggressively campaigned for the importance of the flu vaccine program both nationally and internationally. The WHO and the CDC declared that the seasonal flu vaccine is safe, and the most effective in the protection against the flu and avoidance of severe complications that results in hospitalization. The Florida Department of Health (2015) claimed that "flu vaccination continues to be the main stimulus to protect Florida's families from severe flu outcomes". According to a public health agency in the United States, more than 5,000 people die annually as a result of influenza and its related complications (Florida Department of Health, 2015). This amounts to more than 20,000 people being hospitalized with influenza (Wood, 2011).

## Relevance of Literature Review

Researchers have indicated numerous reasons as to why HCWs are not immunized against influenza. The main reason is that there is a widespread perception that the influenza vaccine has numerous side effects, vaccine inefficacy, where the vaccine should be used by people at high risk, and an over estimation of the risks of the vaccine. Again, there is widespread misunderstanding about the severity of the disease and the transmission of the flu to patients. It is important to have a clear emphasis and accountability to the highest level of health care organization. Successful flu programs should allow for easy access to vaccination over weekends and train the trainers to promote flu programs (Cooper, 2009). As first responders in critical areas, some HCWs, despite encouragements, are ignorant to the dangers of not getting the seasonal flu

vaccine. During the 2009 outbreak of N1H1, researchers showed that in the locations where the vaccine was available, the cohort who was given the vaccination managed better during the flu season than in the groups where the availability of the vaccine was inaccessible. Unfortunately, with the 2009 flu pandemic, studies revealed that the influenza vaccine acceptance among HCWs was internationally low, and the vaccination rates did not increase (Al-Tawfiq, 2012).

According to research, multiple programs have been launched to oversee the vaccination of health staff across the globe. Health care agencies and facilities have supported and created policies indicating that institutional requirements promote immunizations to all medical practitioners, especially nurses. The only exceptions allowed are religious, medical, and philosophical reasons. However, the issue of health worker immunization, especially among the HCWs, remains to be a controversial issue. Policies are challenged due to the principle of choice and privacy; however, it is pivotal that HCWs understand the risks towards immunosuppressive patients.

An existing state of nursing practice for recommendations to improve flu vaccines among HCWs involves identifying substantial gaps in quality and patient safety. According to Institute of Medicine (IOM) 2003, although there is acknowledgement of these gaps in "knowing versus doing," change in health care is slow and difficult relating to HCWs being vaccinated against the flu virus. Patient safety is an important aspect of the quality chasm, also cited by an IOM report (as cited in Institute of Medicine (2003) and Patterson, Cadena, Prigmore, Bowling, Ayala, Kirkman, & Scepanski , 2011). With regard to influenza vaccinations of HCWs, multiple studies have shown that efforts to

improve vaccination rates have been met with limited success. Several researchers have emphasized studies on professional nurses' use of research in practice to the chronicles of identifying and analyzing evidence that relates to nurses using research findings in practice. According to Spires et al. (2011), “concerns about this gap are related to widely held assumptions that patients who receive evidence-based care achieve better outcomes” (p. 2).

## Social Implications

While recommendations; since 1981, relating to the benefits and effectiveness of the flu vaccine has been generated by the Centers for Disease Control and Prevention (CDC) for HCWs to accept the annual flu vaccination, only about half of HCWs in the United States are vaccinated annually (CDC, 2011). Walden University encourages students and supports efforts promoting an optimistic advantage of social change through the implementation of principled, knowledgeable, and ethical scholar-practitioners (Walden University, 2011). The expectations for Walden University graduates are described as being ambassadors who exemplify the qualities of becoming a civic and professional role models by advancing the betterment of society (Walden University, 2011). A crucial component for implementation of a successful flu vaccine campaign among HCWs is the involvement of hospital leadership. It is possible that leadership on board with a mandatory vaccination program. Leadership involvement will be an integral and essential key factor to possibly ensuring that any policy that is put in place is supported and enforced at an organizational level. The AACN (2006) asserts that the essentials of DNP prepares the health care worker to affect social change by actively and

aggressively amending policies that facilitate positive social change to increase quality improvement. A major goal of implementation and intervention is to impart knowledge through education that will lead to behavioral change (Wensing et al., 1998),

## Summary

To remedy the influenza vaccine uptake with healthcare workers (HCWs) of government assisted hospitals, there is a need to identify the percentage of HCW who decline the flu vaccine and identify the common trend from the literature review that describe the barriers to vaccine uptake among HCWs.

Section 3: Methodology: Project Designs & Methods

## Introduction

Poland, Tosh, and Jacobsen (2005) called vaccination a duty of care. Poland et al. proclaimed that it is a nurse's ethical and moral duty to protect patients from "cross-transmission, adding that those who shun the vaccine for reasons other than medical, religious, or philosophical ones, are endangering the lives of their patients" (p.2252). According to Poland et al., it is the health organization's responsibility for curbing yearly exposures that influences the health of patients, workers, and communities (Poland et al, 2005. p. 2254). Participation in research is important for the advancement of nursing along with the development, improvement, and evaluation of treatment plans (McEwen & Wills, 2011).

The Cochrane review methods guide the identification of studies that would meet the eligibility criteria established for the project (Higgins & Green, 2011). Published articles were reviewed electronically using PUBMED, CINHAL, and the COCHRANE library, from 2009 to 2016, searching the following search words: *influenza, seasonal flu, flu, influenza vaccine, vaccination, quality improvement, knowledge, leadership, leadership styles, health beliefs, behavior change, acceptance of the flu vaccine, mandatory requirement, hospital*, and *health care workers*. The search terms were combined to focus the search only on articles related to HCW immunizations practices.

According to CDC reports, HCW vaccination rates are inconsistent and can be capricious, indicating variations from year to year but are consistently well below the Healthy People 2020 goal. For the 2009-2010 influenza season, 61.9% of Health Care

Personnel (HCPs) were vaccinated; for the 2010-2011 season, 63.5% were vaccinated (NVAC, 2013). The NVAC (3013) stated that "in a 2011 CDC report, the results for vaccination coverage was reported to be higher among HCW working in hospitals (71.1%) than among HCP working in ambulatory or outpatient centers (61.5%), patient homes (53.6%), and other health-care settings (46.7%)" (p. 10).

**The Exclusion Criteria**

1. Publication of literature review before the year 2009.
2. Study population that was not HCWs.
3. Studies that were not English.

**The Inclusion Criteria**

1. HCWs who were defined as doctors, nurses, and other allied health workers who have direct contact with patients.
2. Literature from years 2009 to 2016 that included systematic reviews and comparative studies on the influenza vaccine and HCWs.
3. Studies involved HCWs' flu vaccine and behavior changes.

The CDC and WHO consistently suggest that HCWs be vaccinated. With numerous literature reviews and research studies, the evidence shows that the revolutionary method for preventing infection from influenza and possible complications and hospitalization or death is the effectiveness of being immunized against the flu virus. Annual influenza vaccination rates among hospital HCWs are universally low even though suggestive efforts are reinforced from the WHO and public health authorities in many countries (Hollmeyer et al., 2013). The gap in practice addresses problem for health

care workers during the 2014-2015 flu season, the vaccination coverage among health care workers was 64.3%, close to early season coverage during the 2013-14 season (629% (CDC, 2012).

## Population and Sampling

The literature review does not require the participation of a research population.

## Project Design

The purpose of this systematic review was to examine published journals and articles by exploring strategies that have been proven to increase vaccine uptake among HCWs. The aim was to identify the effects of hospital leadership involvement on improving the flu vaccine and the importance of recognizing the barriers that prevent HCWs from accepting the flu vaccine. Reviewing literature about the significance of leadership involvement to understand health beliefs of HCWs by providing strategies that would improve the acceptance of the flu vaccines among HCWs.

## Purpose & Method

Influenza has the prevalence of progressing to a terminally infectious disease, causing 226,000 hospitalizations and 36,000 deaths in the United States each year (Toronto & Mullaney, 2010). In the cumulative literature review, I identified and addressed the effects of leadership involvement in the flu vaccine campaign, and the significance of education that would influence and improve the seasonal flu uptake among HCWs. The contributions made from this literature review will provide information that associates the possibility of knowledge, perceptions, and beliefs, having an effect on the HCWs regarding the flu and the flu vaccine.

Vaccination when not mandatory is a decision that evokes an individual or societal implication on choice. The goal of HCW vaccination is not only preventing virus transmission to patients but also reducing the risk for infection of HCWs, which in turn preserves an adequate health care work force (Society for Healthcare Epidemiology of America, [SHEA], 2010).

The method for this project focused on scholarly information. The permission and information concerning how many employees were administered the flu vaccine for the 2014-2015 flu season were gathered from infection control within the approved hospital. Since the number of flu vaccines of HCWs in the hospital is mandatory reported information by the CDC, this information is public. The Health and Human Services Action Plan specifically names the Joint Commission as a focal stakeholder that can influence influenza vaccination rates of HCP (Stewart & Cox, 2013).My purpose and mission is to improve the vaccination rates among HCWs within the hospital.

## Data Collection and Intervention Practice

Literature was retrieved from a computerized database search that included PubMed, Cochrane, and CINAHL. The data are presented in a characteristics of included studies table (Appendix A) and include the results of the search and selection criteria in accord with the elements described by Cochrane (Higgins & Green, 2011). The table also includes a notation of grading of the evidence per the criteria given by Melnyk (Melnyk, Overholt, Stillwell, & Williamson, 2010). Melnyk's evidence-based information ranges from Level I, the strongest involving systematic reviews and randomized controlled trials' golden standard (RCTs) to the weakest, Level VII, which

includes evidence from the opinions of authorities or experts (Appendix B; Melnyk et al., 2010). This table includes the following for each identified study: title and year published, study design (stating whether or not the study was randomized and if noted including the duration of the study), participants, intervention (methodology), outcomes, and any additional notes deemed to be relevant.

## Importance of Institutional Review Board Approval

The approval of Walden University IRB is paramount before any data collection can be obtained by the student for any project. The systematic literature review was not initiated until approval was obtained from the Walden University IRB. The IRB approval number is 12-19-16-0382148.

## Data Analysis

The data analysis was from selected articles. The search for the data included a combination of the following keywords: (a) leadership, (b) health beliefs, (3) vaccination, (c) healthcare workers, and (d) interventions for improvement. The selection of literature reviews and articles identified leadership involvement and the understanding of how HCWs' health beliefs influence and improve the vaccine uptake for HCWs. In the systematic literature review, I examined and investigated published journals and articles from 2009 to 2016.

## Validity and Reliability

No instrument was used for this project therefore analysis of validity was limited to an assessment of individual selected studies.

Reliability for a systematic review would occur with the addition of a second reviewer to verify the importance of each identified article and its merit for inclusion in this project. The purpose and scope of this project do not support the inclusion of a second reader for each identified article.

## Summary

Compulsion is authorized usually where individuals are unable to make their own decisions a factor that is not practical in relation to influenza vaccination because health workers are competent decision makers and professionals. As such, it is best to embrace voluntary vaccination interventions and proper incentives to the health workers so they willfully acquire seasonal influenza vaccination. It is highly unlikely that voluntary intervention programs will achieve sufficient vaccination goals and rates. Evidence supports mandatory vaccination but society is resistant to the idea due to its infringement on people's rights (Fiore et al., 2009). The goal of Healthy People 2020 for HCWs to achieve 90% acceptance rate for being vaccinated against the flu, unfortunately this goal can only be achieved by a mandatory policy. According to Patterson, Cadena, Prigmore, Bowling, Ayala, Kirkman, Parekh, & Sceranski (2011), "even though leadership of the US in health-care technologic advances, has influenced the percentage rates of health care workers to accept the flu vaccine, there is evidence that indicates patients in the US receive quality health care only about 55% of the time. "The Institute of Medicine (IOM) in its 2001 report, "Crossing the Quality Chasm," states that between our current health care and the health care that should be "lies not just a gap, but a chasm"(Patterson & et al., 2011, p. 166). Although recommendations and strategies have been made to increase

the vaccine rates. Unfortunately, despite methods to improve the acceptance of the vaccine, health care workers accepting the flu vaccine remains low regardless of reported evidence based practices that indicate health care workers who are vaccinated decrease transmission of the flu virus to patients and their colleagues. It is possible that this goal can only be achieved by a mandatory policy.

Further studies should be continued to investigate the misconception of the risks of the flu that is echoed among HCW to not be vaccinated. The systematic literature review involved an extensive search of research studies that would identify approaches that leadership identifies as barriers and strategize improvement to increase the vaccine uptake among health care workers. The institutional review board is an integral, and essential process of the systematic literature review. According to Burns & Grove (2009) "The IRB purpose includes evaluating research that is exempt from review, expedited review, and complete review, and the committee decides the level of the review" (Burns & Grove, 2009, p. 182). The progress of the systematic review study is dependent on the Institutional review board.

Section 4: Findings and Recommendations

## Introduction

Influenza infections among HCWs lead to nosocomial outbreaks, especially to the immune-compromised patients. It could also lead to staff shortages and the disruption of associated services. HCWs have transmitted influenza to patients in many cases. When it is antigenically compatible, seasonal influenza immunization is effectual among HCWs. Increased uptake by HCWs would also reduce morbidity and mortality in patients who need long-term care and would be protective of the hospitalized patients. Making vaccination of HCWs a priority is particularly important to the elderly and immune-compromised. Although public health institutions as well as the WHO have recommended the vaccination of HCWs against seasonal influenza, the level of implementation is still too low. Hospital administrators and healthcare agencies should respond to this problem by initiating programs to their staff that would ensure compliance of employees and reduce nosocomial transmission of seasonal influenza (Voirin et Al., 2009).

According Schaufeli, Bakker, and Van Rhenen, (2009), the economic health status of corporations correlates directly with employee well-being. The significance of occupational health nurses within corporations and companies can positively influence the employee's decision to be present or absent from work. Preventative measures at work are often beneficial for the organization. Influenza campaigns help keep the productivity within an organization consistent. Influenza is a serious infectious disease, causing 226,000 hospitalizations and 36,000 deaths in the United States each year

(Toronto & Mullaney, 2010). Being sick as a result of the flu virus causes productivity with the organization to decrease. The purpose of this literature review was to provide information for occupational health nurses to review literature that is evidence based that addressed literature proven to improve strategies for successful vaccination rates among HCWs. Vaccination when not mandatory is a decision that evokes an individual or societal implication on choice. The goal of HCW vaccination is not only preventing virus transmission to patients but also reducing the risk for infection of health care workers, which in turn preserves an adequate health care work force (SHEA, 2010). In this DNP project, I explored the numerous literature reviews that showed how leadership involvement, education, and understanding the health beliefs of HCWs could influence a positive change to protect patients and accept the flu vaccine that prevents illness. According to Hood and Smith (2009), the transmission of the flu among HCWs has been studied, recorded, and documented as a problem. The solution to this dilemma is the development of a campaign promoting the flu vaccine among HCWs. In the hospital the challenges that are incurred by Occupational Health Nurses and leaders for the flu vaccine campaign is to increase the influenza vaccine rates among HCWs who are bias to the efficacy and effectiveness of the flu vaccine. To implement an increase flu vaccine rates requires the flu team leaders to review extensive literature reviews and implementation of strategies to improve vaccine rates among health care workers (Hood & Smith, 2009).

I focused on scholarly information from a comprehensive literature review. Each year during the seasonal flu period, there is a hysteria in the hospital setting among leadership, infection control, and the occupational/employee health nurse department on how to increase the flu vaccine uptake among HCWs. The significance of having a high percentage of HCWs accepting the flu vaccine is detrimental since the hospital's reputation is affected by the governmental agency's report relating to quality improvement and patient safety based on the hospital's report of HCWs being vaccinated. The departments within the hospital are responsible for promoting and reporting the results of the number of HCWs vaccinated against the flu virus to the National Institute for Safety and Health (NIOSH); improving the flu vaccine rates is also valuable to meet the recommendations of Healthy People 2020. The objective of Healthy People 2020 circulates on the promotion that vaccination is one of the most effective interventions of preventing the spread of flu amongst HCWs and their patients; therefore, the goal set is for all hospital institutions to have a 90% and above acceptance of the flu vaccine for HCWs by the year 2020. The Department of Health and Human Services action plan specifically cites The Joint Commission as a key stakeholder that can impact influenza vaccination rates of HCP (as cited in Stewart & Cox, 2013). The purpose of the employee health nurse is to improve the vaccination rate among HCWs within the hospital. The value of quality improvement evidenced by increased seasonal flu vaccination uptake by HCWs is reported as a bonus for the hospital reporting quality relating to patient safety. Stewart and Cox (2013) reviewed 20 state laws supporting the yearly seasonal influenza program to HCWs and improved evidenced-based practices.

## Intervention Practice

The proposed supplemental educational intervention for the Occupational Health Nurse is a 13-slide PowerPoint presentation that addresses the risks and benefits of the flu vaccine that could be presented to employees who are undecided about being vaccinated. The intervention practice involves an educational slide that is recommended to be reviewed prior to the HCW signing the declination form. If the employee is still undecided, it is imperative for leadership to understand the barriers that are impeding the employee from taking a preventative step of improving patient safety; therefore, a personal communication should be scheduled between leadership, a manager, nurse manager, or even before the employee signs the declination form refusing the flu vaccine. This extra process may deter the employee from refusing the flu vaccine. The hypothesis is that if HCWs are informed about the severity and benefits of accepting the flu vaccine, then it is possible that after being educated, they will voluntarily accept the flu vaccine more often than those who have not been informed about the severity and complications of the flu causing death. Another suggestion for increasing and improving the flu vaccine uptake among HCWs is to administer a power point presentation that is mandatory for HCWs who refuse. This may be a detour for the HCW and promote the employee to accept the flu vaccine. From the articles reviewed (Monto, 2010; Seale, Kaur, & MacIntyre, 2012;; Seale, Leasik, & MacIntyre, 2009), they indicated that when HCWs are vaccinated, the risks of the flu virus transmission from HCWs to vulnerable patients is definitely reduced. Educating the HCW was also valuable. Peng-jun et al. (2013) commented on the need to provide HCWs educational programs that focus on areas such

as vaccine efficacy, influenza carriage and transmission, and the numerous benefits of influenza vaccination for all parties involved, the HCWs, patients, and family members. In a study piloted by a large inner city tertiary medical center, it was noted that a lack of knowledge regarding the benefits and risks of the flu affected the HCW's decision making on accepting the flu vaccine (Ofstead, 2008).

Brickerd's (2013) identified five reasons Delaware HCWs chose to voluntarily vaccinate against influenza. The reasons included advocacy (role modeling or health promotion), perceived benefit, need for education, policy development (mandates), and fear of illness, respectively. Brickerd's inquiry of what initiatives Delaware HCWs thought could increase rates of influenza vaccination revealed enhanced education, dissemination of accurate information, and dispelling myths about vaccine efficacy and safety. Policy development and addressing vaccination rates were perceived to be influential for increasing vaccination rates, but only as part of the educational strategy. In a systemic review conducted by Burls et al. (2006), 10 studies were included to assess why HCWs declined or accepted influenza vaccine. From the review, the majority of respondents (82-83%) vaccinated to protect themselves, and 62% to 67% vaccinated to protect patients. Reasons provided to decline influenza vaccine included fear of side effects (8-51%), fear of causing influenza (21-45%), dislike of injections (5-27%), unaware the vaccine was available or useful (3-53%), forgetting or lack of time (5-60%), and perception of being at low risk for contracting influenza (5-29%; Burls et al., 2006). In a study collected by Durando et al. (2016) a total of 830 HCWs completed the survey. A doctor confirmed that the flu vaccine was safe, yet the results of the data collected

reflected that barriers to the acceptance of the vaccine was dependent on the belief that pharmaceutical companies influence decisions about vaccination strategies. Vaccination is globally considered the ultimate preventive tool against flu; however, a recent survey documented official vaccination coverage rates collected in 10 European countries during three consecutive flu seasons from 2008 to 2011 showed that the uptake among HCWs continually remained below 35% (Durando et al., 2016).

In Toronto & Mullaney (2010), There were five Perceived barriers found to be reasons that nurses did not take the vaccine; vaccine efficacy, vaccine safety, lack of knowledge, avoidance of infections, and time constraints. There are various interventions to promote influenza vaccination among healthcare workers. They include announcing the availability of the work via email, newsletters or through paycheck inserts. The other way is making the influenza vaccine available. The most effective intervention would be mandatory vaccination of healthcare workers. Healthcare facilities should also take to educating the healthcare workers and making the vaccination an organizational culture. To reduce the costs, offering the vaccine on-site or off-site with health education and mobile units. The vaccine could also be offered at reduced costs and multiple locations. Free on-site vaccinations as part of the multi-component intervention could increase seasonal influenza vaccination among health workers if implemented. The leadership could also embrace sustained vaccination strategies with a strict commitment from hospital management.

## Implications of an Evidence-Based Project

Although there has been progress in making quality indicators and risk-adjustment mechanisms to parallel with the quality that is represented across many institutions by examining practices and cultures in high-performing hospitals defining quality, there is little evidence to indicate the "dynamics of hospital performance" and the question is are hospitals improving or deteriorating in quality (Carroll et al., 2007). To improve with quality there is constructive evidence that immunization of health care workers (HCWs) suggests that the vaccine for influenza is most effective in preventing the spread of this disease and lowers mortality among patients. Unfortunately, worldwide influenza vaccination rates are undoubtedly low among HCWs; especially with nurse vaccination rates among the lowest which may affect the quality and regards to patient safety (Rhudy et al., 2010). Vaccination is an effective and preventative guide against influenza, and can prevent illnesses, deaths, and losses in productivity (CDC, 2010). Completion of campaign programs and promoting high influenza vaccination coverage among nursing students and healthcare workers is intended to help protect the student nurse, HCW, their patients and reduce healthcare cost (CDC, 2010). The focus during the flu season is to increase the awareness and voluntary acceptance rate of the influenza vaccine among HCW's; however, this task appears to be an arduous one, especially with the premise of everyone self-medicating or treating themselves with the symptoms of a cold or flu. There is a need to change the environmental philosophy of the HCW and nursing students in respect to avoiding transmitting the flu vaccine.

Education could dispel some notions about influenza vaccination. According to Rebmann, Wright, & Anthony (2012) the most common reason health care workers declined vaccination was listed as follows: they believed they did not need it. They also expressed concern about the effectiveness of the vaccine and about the side effects. Providing a safe and healthy workplace is a legal requirement, the purpose of the project is to promote the positive outcome of being vaccinated thereby changing the perception of the nursing students entering the health profession recognizing their social responsibility to prevent the transmission of the flu virus to those patients they took an oath to do no harm too.

In order to sustain the improvement initiatives, there are several strategies that the leaders and team member may use including sharing information and creating effective communication channel with the stakeholders. Indeed, opening channel of communication in all disciplines involved in the initiative will permit voicing of observation and concerns throughout this process of creating change.

Health Care Workers are at a greater risk of contracting influenza due to their close proximity with patients during caring for and attending to patients. No instrument was used for this project therefore Analysis of data is important in regards to reliability and validity. Vaccination against influenza is estimated to provide greater than 60% protection against infections, therefore the importance of being immunized both patients and health care personnel is pragmatic (Bridges, Kuehnert, & Hall, 2003).

Validity focuses on accuracy it is a tool that has to be routine and precise. An instrument is valid if it accurately represents the underlying characteristic of interest.

Analysis of the data needed to include consideration of design, bias or limitations may affect the validity and reliability of the results (Hodges & Videto, 2011).

**Interventions Used in Hospitals to Upsurge the Medical Care Workers Vaccination**

Healthcare workers are at constant threat of being exposed to various deadly infectious diseases owing to their close interactions with patients. The extreme nature of their work and the type of patients they assist with care can escalates the probability of them spreading infections. To reduce the possibility of transferring infectious diseases or spreading infections, and reduce the morbidity rate of patients from infections transmitted to them by health workers, the HCW is strongly advised to be vaccinated against the flu virus. Development of efficient methods of monitoring the transmission of diseases, the use of vaccines needs to be advanced.

The vaccination rates for health care workers remain considerably below the ratified recommendations. Literature reviewed by the CDC, (2015), Poland, Jacobson, & Sullivan, (2009), referred to reviews that even though recommendations have been given for HCW's to be vaccinated against the flu, their vaccination rate is still below 50 -60%. Conversely, various infections circulating can be prevented through vaccines. When health care workers contract these infectious diseases, that can be preventable, the result is costly to the employer, as a result there is a lot of absenteeism, increased medical costs to organizations and an increase in the mortality rate of patients. Encouraging the vaccination of healthcare workers to uphold their immunity is, therefore, crucial. The optimal use of consistent vaccination campaigns could significantly lessen the number of

vulnerable health care employees and also reduce the risk of transmission of this infection from attendants to patients.

The research developed by Thomas, Lassorn, and Jefferson (2015) showed the effectiveness of intervention in vaccination of health care workers. Thomas, Lassorn, and Jefferson (2015) argued that interventions that promoted flu campaigns for health care workers to be vaccinated provided protection to patients aged 60 years and above in long-term care institutions. The studied include four clusters of residents studied during specific seasons of influenza infections. Total residents (n=8468). The residents in intervention were (n= 100) and control residents (n=100) during the different seasons. The long-term care institutions offered Influenza vaccinations to their workers. However, the long-term care institutions in the control arm did not offer influenza vaccines. The frequency of laboratory-confirmed Influenza rates in the total residents was also compared. In two studies conducted to the clusters with (n=752). Influenza confirmed in control room was 5 per 100 people and 2 per 100 in the intervention arm. The risk of transience in the intervention arm ranged from 5-13% and 6-22% in the control arm for all residents (n=8468). The risk was established at 95% confidence interval signifying that the long-term care institutions intervention reduced the spread of influenza.

From the numerous literature reviews, the common denominator that is evident for HCW's classifying as barriers to the influenza vaccine uptake according to a report advanced by Moore & Charvat (2009), is the lack of transparency to the effectiveness and validity of the flu vaccine. The commonality from these reviews indicated that HCW's that refuse the flu vaccine often do not discern the risks of influenza and how it can be

transmitted. Another factor, expressed within the literature review and the HBM describes the barriers are a result of how the health care workers perceived the severity, susceptibility of the flu, especially if they are not suffering from the ailment themselves and they also perceive that taking the immunization would increase their likelihood of an attack by the infection.

**Leadership Involvement Helps Improve the Flu Vaccine Rates**

Hospital leadership plays a key role in the intervention and increase in vaccination rates of its workers. They are in a strategic position to increase the vaccination rates since they hold a key concern on the safety needs of their medical personnel and patients. Leader's influence their employees' they provide direction and motivation to change the behavior of healthcare. The hospital leadership is also in a position to implement effective programs that will bring satisfactory immunization. In addition, leaders should act as mentors to their junior staffs by taking up the vaccines and volunteering their time to help distribute promotional materials that encourage the vaccine uptake. Another important aspect that influences the vaccination process is the leadership style which entails the approach of implementing plans, motivating people and providing direction to the employees (Moore & Charvat, 2009). The theorists in medical leadership identified transformational and transactional management as the two major categories of leadership styles that may affect the process of Influenza vaccination of the healthcare workers.

The two types of leadership styles are essential in facilitating a vaccination process of the employees. The transactional leaders seek to uphold the hospital procedures through supervision and organization of employees. Therefore, they will be

vital in reinforcing the vaccination process if Influenza vaccination deemed mandatory. However, the transformational leaders are the most effective in facilitating the vaccination process because of their positive leadership style that seeks to motivate employees. These leaders enhance the employee`s morale in taking the vaccination and operating by the hospital's guidelines as opposed to the former leadership style that uses authoritative means (Moore & Charvat, 2009).

Moreover, the literature reviewed implied that majority of health institutions have removed the barrier of cost of the vaccine to their employees. Increasing commitment to combating the flu threat by raising the portion of revenue in the total budget intended at promoting measures aimed at creating awareness on immunization. (Moore & Charvat, 2009).

## Impact of the Interventions

Annual vaccination of health workers against seasonal influenza has potential benefit to their patients, themselves, and their families since it reduces the transmission of influenza within the healthcare environment. Vaccinating employees reduces absenteeism, which in the end saves employers a lot of money spent on the vaccination program. In the US alone employers could save $2.58 for every dollar invested in the vaccination program. There is evidence that vaccination of healthy people below the age of 60, including health workers could lead to decrease cases of infection among these groups (Hollmeyer et al., 2002). Programs that target previously identified barriers to health staff evaluation have greater impact than generic programs. The increased rate of acceptance and reduced illness and absenteeism among workers have been achieved by

addressing common misconceptions through education and administering seasonal influenza vaccination free of charge (Hollmeyer et al., 2002). Similarly, little incentives to staff and vaccination through mobile units help the participants a lot. Targeting known barriers have resulted in an increase in vaccination rates in the USA from 42% to 77% over a period of three years. Another US program combined free vaccination and worker education increasing the coverage rates of influenza from 5% to 44% within a year. Vaccination is the most effective measure at preventing flu virus and its severity to patients within the hospital, studies have shown that when the flu vaccine is administered to health care workers it can reduce the economic burden caused by the flu virus. Globally, the seasonal flu creates an economic burden studies by WHO (2012), Molinari et al. (2007), and Nichol, D'Heilly, Greenberg, & Ehlinger, (2009) proposed the financial strain of influenza from developed countries to be in US currency $1 million to $6 million per 100,000 population. The Society for Healthcare Epidemiology of America (SHEA) recommended the flu vaccine for health care workers and agreed that vaccination of HCWs as a professional safety practice (Talbot et al., 2010). The benefits of compulsory vaccination are insurmountable as it provides high levels of patient protective as well as decreased transmission and absenteeism. The best way to ensure health care vaccination would be to make it a requirement for employment. However, there are controversies over mandated vaccination that it interferes with the workers' autonomy and infringes in their rights (Fiore et al., 2009). The cost of compulsion is authorized usually where individuals are unable to make their own decisions a factor that is not practical in relationship to influenza vaccination health workers are experienced

and knowledgeable about decision making and professionalism. As such, it is best to embrace voluntary vaccination interventions and proper incentives to the health workers so they willfully acquire seasonal influenza vaccination.

**Weakness Discovered**

Unanimously, throughout the literature review governing agencies support the evidence that it is beneficial for health care workers to be vaccinated against the flu virus. Although there are numerous studies for the influenza vaccine effectiveness the variety of vaccine strains are not compatible with circulating influenza viruses, the benefits of vaccination may be reduced. For example, "patients with more serious influenza associated events are generally a select group of older persons with other comorbidities. Cochrane analysis, evaluated influenza vaccine effectiveness for the prevention of hospitalization in adults 50–64 years of age using laboratory-confirmed influenza and community controls. Vaccine effectiveness was 35.6% (95% CI, 0%–63.2%) and 90.5% (95% CI, 68.1%–97.2%) for those with and without high risk conditions, respectively" when the vaccine strains are not (Talbot, Griffin, Chen, Zhu, Williams, & Edwards, 2011, p.506) correctly matched to viruses in circulation.. A factor that presents as a barrier for some health care workers is the efficacy of the vaccine strain.

HCWs relates to the effectiveness of the flu vaccine, in that it takes approximately two weeks after vaccination for antibodies to develop in the body and provide protection against influenza virus infection. In the meantime, they are at risk for getting the flu, and possibly getting the flu from patients this represent a weak link in the chain for persuading the health care worker that the flu vaccine was effective. Weigel (2014) and

Osterholm, Kelley, Sommer, & Belongia (2012), in a review involving a combined 2011 meta study from the University of Minnesota, Johns Hopkins University and the Marshfield Clinic Research Foundation analyzed 31 articles on the efficacy and effectiveness of influenza vaccination. The time frame for these trails was 44 years the results of the 17 randomized controlled trials only 35% showed the effectives of vaccine. The most effective administration for flu prevention was the nasal spray form of the vaccine which was determined to be 75% effective in 12 separate flu seasons; unfortunately, for participants ages 18 to 46, the spray was not particularly effective (Weigel, 2014).

## Limitations

The health belief model is the model commonly used theoretical framework for investigating preventative health behaviors, however it is limited in explanation of the relationship of preventative health behaviors and cultural practices. Lack of understanding is a limitation for the decrease rate of HCW taking the flu vaccine. Immunization is considered the safest and most effective method of preventing influenza (Backer, 2006). However, the vaccination rates among health care workers remains globally low. Influenza, as common as it is, is a greatly misinterpreted the severity of the disease is often misunderstood. Seasonal influenza kills about 250,000 to 300,000 people globally. In the United States 36,000 people die each year, greater than 90 percent of whom are 65 years or older (Fauci, 2005). Tuttas (2011), reports that seasonal influenza has been documented to cause 5% to 15% of the world's population yearly , with severe

illness occurring in 3-5 million people, resulting in death for 250,000-500,000 annually (WHO, 2010; Tuttas, 2011).

## Strengths

There is a wealth of literature available about the seriousness, efficacy, and effectiveness relating to the flu vaccine. Numerous research has been done indicating the pro's and con's for health care workers to be vaccinated with the flu vaccine. With recommendations from many health care governing agencies promoting the flu vaccine it is possible that health care institutions will incorporate education into their policies, credo, and mission of their organizations, thereby changing the mindset from feeling involuntary coerced to accept the flu vaccine to voluntarily accepting the flu vaccine, because they have acknowledged the benefits of the flu vaccine to protect themselves and prevent the transmission of the flu to patients, honoring the pledge of doing no harm to the patients they plan to serve. Recommendations from hospitals and health care agencies are promoted thru education, and sometimes to enforce the change policies are mandated. There is tremendous amount of evidence to prove that a substantial evidence suggesting that increasing the rate of influenza vaccination of HCW can reduce the risk of transmission to patients acquiring influenza from health care workers in the health-care system. Education promoted by the combined campaign team planners in conjunction with occupational health nurse will change the mindset of health care workers and increase the hospital flu vaccine uptake among health care workers. Evaluation is not an action that occurs once at the end of the program, "but is rather an ongoing process that

produces information used by a variety of people to describe, improve, adapt, and make decisions about the program" (Hodges, with Videto, 2011, p. 207).

## Implications for Social Change

There is a need to change the environmental philosophy of the HCW if given the choice they would not accept the flu vaccine was related to knowledge deficit of not understanding the risks verses the benefits of the flu vaccine. A campaign will be initiated to educate the health care worker implemented by the following: mandatory presentation that focuses attention on evidenced-based practice, and the benefits of being vaccinated, and examples of cases of incidences related to individuals who were intubated as a result of complications from the flu.

An example of Green and Tones (1999) theory model is shown to indicate that the development and application of theory in practice is evidence for health promotion success.

Leading by example is often paramount for success, being informed helps the individual to make a positive change for the social good of all, the CDC recommends that HCW's, students and other health care personnel be vaccinated with the flu vaccine. "Many health care workers testified to  a lack of awareness and understanding of the influenza vaccine", especially in relationship to its advantages and disadvantages (Canning, Phillips, & Allsup, 2005, p. 922), therefore they opted out to receive the vaccine during the winter season some had symptoms of the flu which resulted in absenteeism. Agencies that mandated the flu vaccine coverage was highest among HCW working in settings with flu vaccination requirements (97.8%).

As a DNP scholar I have gained increase understanding on the importance of leadership involvement, and acceptance of the leader to embrace cultural beliefs, which is compulsory to influence a social change within the organization and environment. Although change is evident, it is often met with resistance due to lack of understanding. This project utilized the HBM to initiate change by understanding various influencers for change and those that oppose change. An individual behavior will not be changed until their cultural beliefs, or practices are understood to include what is perceived as susceptible or severe to the individual. The reviews of numerous literature reviews has revealed the importance of understanding the barriers towards preventative vaccines, not only for patients but health care workers. The journey in accomplishing this systematic review has developed the expertise of this researcher and has allowed her to support the credible evidence-based applications into practice.

Walden University promotes the philosophy of social change, and therefore health care leaders are encourage to develop innovative and creative ideas that promotes behavioral changes that will impact social change in the community, city, and the world. This literature review showed that the HCW It is evident from the extensive literature review that informing and educating the health care worker to understand the risks and the benefits of being vaccinated against the flu virus, will contribute to a positive outcome for social change, and the end result will be an increase of voluntary acceptance to the flu vaccine. The NLN (2012) is confident that Doctoral prepared educators are required to respond to national directives for leading curriculum change, developing

models of cost effective education, and preparing a workforce to meet the needs of a reformed health care system, both nationally and globally (NLN, 2012).

To create change requires one to be a visionary, even thou it is not tangible they believe it is achievable. Growing as a leader requires a combination of intentional growth and leadership experience (Maxwell, 2011, p. 15). During the course of this project this researcher understood the value of connecting academic knowledge with clinical knowledge as an advance practice nurse; in order to make changes whether in the clinical arena or policy changes I currently hold an office as a governmental affairs officer within the state I practice in. According to AACN (2006) the DNP program prepares the Health care leader to be creative and develop intervention that complements the processes to evaluate outcomes of practice, practice patterns, and systems of care within a practice setting, health care organization, or community against national benchmarks to determine variances in practice outcomes and population trends (AACN, 2006, p. 13). Professionally the DNP graduate combines experiences with two additional skill sets: the ability to analyze and develop the policy process and the ability to engage in politically competent action (O'Grady, 2004).

## Summary and Conclusion

According to the broad literature search leadership involvement, educational and vaccine promotion have proven to be beneficial in increasing vaccination rates among health care workers. Ottenberg & et al. (2011) implied that when public health is jeopardized, and a safe, low –cost, and effective method are utilized to achieve patient safety. Health care organizations and public health authorities have an obligation to take

action and change the status quo. Mandatory influenza vaccination for health care workers is encouraged by a scientific data but also by ethical principles and legal precedent (Ottenberg, & et al.). This is important given that the work of quality improvement also relies on teamwork (Kelly, 2011). Another strategy that is very significant includes the involvement and engagement of all health care workers and leadership to facilitate a social change. Preventative measures may develop policies to implement change that mandates that all health care workers within the hospital are informed of the importance of flu vaccine for preventative illnesses the end results are HCWs becoming change makers for promoting the flu vaccine.

Education could dispel some notions about influenza vaccination. According to Rebmann, Wright, & Anthony (2012) the most common reason health care workers declined vaccination was listed as follows: they believed they did not need it. They also expressed concern about the effectiveness of the vaccine and about the side effects. Providing a safe and healthy workplace is a legal requirement, the purpose of the project is to promote the positive outcome of being vaccinated thereby changing the perception of the nursing students entering the health profession recognizing their social responsibility to prevent the transmission of the flu virus to those patients they took an oath to do no harm too.

In order to sustain the improvement initiatives, there are several strategies that the leaders and team member may use including sharing information and creating effective communication channel with the stakeholders. Indeed, opening channel of

communication in all disciplines involved in the initiative will permit voicing of observation and concerns throughout this process of creating change.

## Recommendations for Further Study

The low percentage rate of Health care workers accepting the flu vaccine, stem from the fear of the risks of the vaccine, in particular the fear of getting Guillain-Barre Syndrome (GBS). In 1976 there was an increase of individuals who were diagnosed with GBS after being vaccinated with the flu vaccine, since that time many nurses are afraid of the possible side effects. Nelson (2012) stated that in 2009 was the year of H1N1 swine flu scare, and everyone was expected to be vaccinated; this vaccine was linked to a greater risk of GBS, as in 1976. According to Nelson (2012) surveillance for GBS was conducted in 2009–2010 the experience during 1976 reflecting 362 GBS cases' which occurred 6 weeks after influenza vaccination of 45 million persons, an 8.8-fold increase over background rates, this increase was risk of GBS compared to the risks of the complications of the flu is minimal. This works out to be about 1.6 extra GBS cases for every million people vaccinated (Nelson, 2012).

Education within the HCW's population and the allied health schools must stress on the importance of the flu vaccine, based on some of their responses thus far their decisions indicates that there is a lack of understanding and knowledge based on the perception of the risks of the flu, and the benefits gained from getting the flu vaccine. With increase knowledge about the purpose of this preventable disease vaccine, the students would change their negative perspective and gain positive outcomes as they willingly accept the flu vaccine regardless of the mandatory requirement; since after

increase knowledge they have an understanding of the serious complications and traumatic consequences if the flu virus is transmitted to them or the patients they are assigned too.

The results from the literature review suggest that educational programs as a singular intervention, although valuable may not be sufficient to revolutionize changes among HCW's, the impact of the education may decrease the misconceptions about the flu vaccine, but it is necessary to understand the HCW beliefs and cultural practices. The involvement of leadership is beneficial to achieve the zenith of the desired goal and expectation of management within the organization HCW receiving the flu vaccine within the organization. Further studies and implementation are warranted to increase awareness among HCW's, and the public. From this study it is obvious that promotional events must be done repetitively to inform the community on being vaccinated. Communication should echo the seriousness of the risks of not accepting the vaccine. As stated above it is also the responsibility of public health to promote the flu vaccine thru mass media, and television advertisements that are also done in other countries concerning seriousness of the flu and personal hygiene from transmitting the flu to others.

Unlike other vaccines, which are given one or two times as a requirement for HCW such as; hepatitis B, or Tdap, the receptiveness of being told that the flu vaccine needs to give annually and the strains varies from year to year without true accuracy is a barrier that is noted. A solution to this barrier would be a universal flu vaccine that is taken one time. An international convention of pharmaceutical and biotechnology companies, hospitals and academic research institutions globally are pursuing the

development of a single universal influenza vaccine (Rudolph & Ben-Yedidia, 2011, p.9). Coincidently, because of the frequent mutations and variations of the influenza virus annually the previous year vaccine is not mutated by design to protect against the flu. Rudolph and Ben-Yedidia (2011) exclaims that the annual reformation of the flu vaccine necessitates annual reformulation of the vaccines, resulting in the public having to be immunized annually with the flu vaccine of that particular

## Section 5: Scholarly Product

Leadership and improvement team members play a key role in changing and supporting improvements efforts. The influence of hospital leadership has been evaluated as critical because the impact of leadership involvement with the flu campaign has played a significant role in the promotion of flu vaccine uptake among HCWs. The results of the literature review showed evidence that without leadership or governmental involvement with recommendations and suggestions, the decision and results for increased flu vaccine acceptance among HCWs would not have increased. Previous studies have indicated that increased flu vaccines rates among HCWs are the result of state government agencies (The Joint Commission, CDC), professional organizations such as the America Medical Association and the American Nurses Association (AMA, ANA), and health care system Hospital Corporation of America (HCA, for profit hospitals) development of policies mandating vaccination as a condition in the process of being hired or maintaining employment( Caplan, 2012; Music, 2012; Talbot et al., 2010; ).

According to Graeve, McGovern, and Nachreiener (2014),

> Although different methods can be used to value productivity, the human capital method takes into account the patient (or employee) perspective and counts hours not worked as hours lost (van den Hout, 2010). Health economists have described employees' productive output during periods of illness, injury, or disability when employees are on leave from work to rest and recover as less than 100% due to poor health or limited function (van den Hout, 2010). Industry leaders are looking

> for ways to cut costs and, at the same time, increase employees' productivity (Wallace, 2009). p. 36)

The intricacies of hospital leadership involvement to implement change often is guaranteed by sufficient financial resources that identifies capital that is required for the change for flu vaccine improvements, or policy that permits additional time for the work to be carried out, enabling and facilitating Occupational Health Nurses and other interpersonal team players the opportunities to actively promote change processes, and emphasizing safety as the organization embarks on the change processes (Streiner & Norman, 2008). As such, it is important that leaders and team players understand the high impact flu education, health beliefs, and cultural practices have on the decisions made by staff, which can assist with the change practice within the hospital to improve quality to the patients and health industry.

**Analysis of Self as a Scholar, Practitioner, Project Developer, and a Professional**

As a scholar, I have gained an increased understanding of the importance of educating HCWs to promote health literacy and the promotion of wellness. Although change is evident, it is often met with resistance. In this project, I used the HBM to initiate change by understanding various influencers for change and those who oppose change. An individual behavior will not be changed until his or her cultural beliefs or practices are understood to include what is perceived as susceptible or severe to the individual. This project has revealed the importance of understanding the barriers towards preventative vaccines, not only for patients but also for HCWs. The journey in accomplishing this project has developed my expertise and has allowed me to focus

heavily on the practice that is innovative and incorporates credible evidence-based applications into practice.

Walden University promotes the philosophy of social change, and therefore, students are encouraged to develop innovative and creative ideas that promote behavioral changes that will impact social change in the community, city, and the world. This project is the genesis of social change. I have developed and expanded on leadership skills and roles among other health care leaders. The development of this project has allowed me to be informed of the history and severity of the flu. The ability and privilege to educate nursing students and health care workers in the Caribbean, by focusing on promote the importance of being vaccinated against the flu. The action of presentation included speaking about the subject even privy to accompanying an international medical team by presenting the value of health care workers to be immunized. The urgency of the presentation involved bringing awareness and understanding about the risks and the benefits of being vaccinated against the flu virus. As a result, the positive outcome for social change will be an increase of voluntary acceptance to the flu vaccine, thereby decreasing the risk of transmission of the flu virus to other individuals within the hospital settings. The completion of this project started as an academic journey to achieve the goal as a doctoral professional. The process directed my ambition of being an evidence-based practitioner to pursue clinical expertise throughout my practice.

During the course of this systematic literature review, I have understood the value of connecting academic knowledge with clinical knowledge as an advance practice nurse

in order to make changes whether in the clinical arena or developer of policy changes. For the past 2 years, I have been humbled and honored to represent the position for the State Occupational Health Nurses Association as an office of Legislative and Governmental Affairs officer, my involvement can be an asset to invoke change in policy making., As a DNP prepared graduate the exposure to develop policies to initiate change that impact prevention of illness and facilitating the process of global health and wellness is promoting the ambition of the mission of the role of an DNP graduate. According to AACN (2006), the DNP program prepares the student to "design and implement processes to evaluate outcomes of care within a practice setting, health care organization, or community against national benchmarks to determine variances in practice outcomes and population trends" (AACN, 2006, p. 13). Professionally, the DNP graduate integrates experiences with evidence-based practices. As a DNP graduate, this project has influenced social change to promote and integrate best practices, create policies, and expand on research in the practice setting locally, nationally, and internationally (AACN, 2006).

## Summary and Conclusion

According to the numerous pieces of literature reviewed, it is evident that leadership, whether state government or hospital administration, education, and flu vaccine promotion have proven to be beneficial in increasing vaccination rates among HCWs. An approach that may lead to supporting and satisfying the improvement efforts of what is been promoted is empowering and motivating HCWs to get involved in self-teaching to understand the benefits of getting the flu vaccine. Understanding the benefits

of being vaccinated and the involvement of leadership will help the occupational health nurse to meet the achievement goal of 90% by the year of 2020. Annual vaccination is the best method to decrease and prevent influenza infection (CDC, 2012). Ottenberg, Poland, Jacobsen, and Koenig (2011) implied that when public health is jeopardized, and the opportunity for a safe, low-cost solution is available to pursue patient safety, health care organizations and public health authorities have an absolute responsibility to take action and change from the status quo.

Mandatory influenza vaccination for HCWs is supported not only by a myriad of scientific data but also by ethical principles and legal precedent (Ottenberg et al., 2011). Quality improvement relies on studies that provide evidence-based practices that determine vaccination for HCWs and leadership involvement, and the teamwork of the flu campaign promotes a positive uptake of HCWs being immunized (Kelly, 2011).

A significant strategy for the success of increasing the percentage rate of HCWs immunized is the involvement and engagement of all leadership and stakeholders, which may include sponsors to provide financial resources and personnel to deliver understanding of the importance of investing resources in the processes. The leadership team, occupational health nurses, and stakeholders are of great importance in the improvement process. Leadership can and may influence change and may develop policies to implement change that mandates that all within the hospital community are informed of the importance of the flu vaccine to become change makers for promoting the immunization.

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# Appendix A: Evaluation Table

| Author & year | Title, aim or framework | Level of evidence | Purpose of literature | Design & methods | Findings | Evaluation / Conclusions |
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| Thomas, Lassorn, & Jefferson, (2015) | Systematic review of interventions to increase influenza vaccination rates of for health care workers who care for patients 60 years and older | I I | To test interventions that increased the influenza vaccine rates among HCW's. To know if vaccinating healthcare workers against influenza reduces the risk of older individuals in long-term care institutions (LTCIs) acquiring influenza infections from healthcare workers. | To identify all randomized controlled trials (RCTs) and non-RCTs assessing the effects of vaccinating healthcare workers on the incidence of laboratory-proven influenza, pneumonia, death from pneumonia and admission to hospital for respiratory illness in those aged 60 years or older resident in long-term care institutions (LTCIs). | Five studies were included within the review; however only three trials used with 5896 residents. Four clusters of residents we studied during distinct seasons of influenza infections. Total residents (n=8468). The residents in intervention were (n= 100) and control residents (n=100) during the different seasons. . | Evidence showed that the review findings did not identified conclusive evidence of the benefit of HCW vaccination programs on specific outcomes of laboratory-proven influenza, its complications (lower respiratory tract infection, hospitalization or death due to lower respiratory tract illness), or all cause mortality in people over the age of 60 who live in care institutions. This review did not provide reasonable evidence to support the vaccination of healthcare workers to prevent influenza in those aged 60 years or older resident in LTCIs. |
| Giannatta sio & et al., (2015) | Aim of this observational two-phase study was to estimate the H1N1 immunization rates for influenza in four subsequent seasons and for pandemic H1N1 influenza in HCWs of a University Hospital, and to investigate its distribution pattern and the main determinants of immunization | I V | To Increase Europe's flu vaccine rates among HCW's. Despite consistent recommendation s by all Public Health Authorities in support of annual influenza vaccination for at-risk categories, there is still a low uptake of influenza vaccine. In the US flu vaccine rates among HCW has increased about 60%. Recent evidence reported influenza vaccination rates ranging between | This cross-sectional study was carried out at a tertiary-care University Hospital in Southern Italy. An anonymous questionnaire consisting of a demographic section, professional category and 7 multiple-choice questions exploring determinants and barriers to influenza vaccination. Some questions required a yes/no response (e.g. "Did you receive the pandemic H1N1 flu vaccination?"). | A comparative evaluation of H1N1 vaccination coverage in health care categories was as follows: 205/837 (24.5 %) staff physicians, 143/750 (19.1 %) residents, 144/868 (16.6 %) nurses and paramedics, 7/102 (6.9 %) laboratory and administrative personnel ($p < 0.0001$). Trust in recommendatio ns on influenza vaccination should be improved among HCWs. | Vaccination campaign combined education and promotion, free vaccination, flexibility of delivery of vaccine in terms of day of the week and hours, involvement of hospital's leaders and administrative support. Mandatory influenza vaccination for HCWs, especially in settings where high-risk groups are treated, should be considered as a possible strategy to increase vaccination rates. |

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| | | | 5.8 % (Greece 2006–07) and 35 % (Germany 2010–11) | The healthcare categories were divided by departments; such as, Pediatrics (n=182) the doctors, Infectious Disease (n=59) and OB/GYN n= (137) for taking the flu vaccine accepted most was by physicians within the ID department at 68.2% (Giannattasio, & et al., 2015) | by education and optimizing organizational barriers to allow flexible and workplace vaccine delivery. | |
| Poland et al., (2005) | Requiring influenza vaccination for health care workers: Seven truths we must accept. The aim of this literature is to outline the seven primary truths supporting the call for requiring influenza immunization of all health care workers | VI | Unfortunately, health care Workers have demonstrated, over almost 25 years that they are unwilling to comply with voluntary influenza immunization programs. The goal of utilizing a variety of education and incentive programs, at rates sufficient to protect the patients in their care. inter | Findings showed that influenza vaccination. have 25% fewer upper respiratory Infections, 44% fewer doctor visits, and 43% fewer sick days off, saving an average of $47 per person annually. (p.2253) | A finding from the truths described is: influenza vaccination of health care workers save money for employees and employers and prevents workplace disruption it was reported that healthy working adults who receive influenza | High rates of health care workers immunization will benefit patients, health care workers, their families, and employers, and the communities within which they work and live. |
| Durando et al., (2016) | Determinants of adherence to seasonal influenza vaccination among **healthcare workers** from an Italian region: results from a cross-sectional study. | I V | To examine and understand the reasons for the low adherence to **flu** vaccination , a study was carried out among HCWs of two **healthcare** o rganizations in Liguria, a region in northwest Italy. | Cross sectional study based on anonymous self-administered web questionnaires carried out between October 2013 and February 2014. Through univariate and multivariate regression analysis investigated the association between demographic and professional | A total of n= 830 HCWs completed the survey. Factors statistically associated with **flu** vaccina tion uptake in the 2013/2014 season were: being a medical doctor and agreeing with the statements '**flu vaccine** is safe', 'HCWs have a higher risk of getting **flu**' and 'HCWs should receive **flu** vacc ination every | An associated factor that was significant was based on educational level and how the disease was perceived the survey allowed the researcher to better understand the determinants of adherence to vaccination as a fundamental preventive strategy against **flu** among Italian HCWs. These findings should be used to improve and customize any |

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| | | | | characteristics, knowledge, beliefs and attitudes of the study participants and (i) the seasonal **flu** vac cination uptake in the 2013/2014 season and (ii) the self-reported number of **flu** vaccinati on uptakes in the six consecutive seasons from 2008/2009 to 2013/2014. | year'. A **barrier** to vaccination was the belief that pharmaceutical companies influence decisions about vaccination strategies. Discussion: | future promotion **campai gns** to overcome identified **barriers** to immunization |
| Zhang et al., (2012), | The aim was estimate the coverage against H1N1 influenza in nurses and determines the vaccination behaviors. | I V | Multidimensiona l health locus of control (MHLC). Limited sample group which was sought out. Possibly having same belief based on training and education | 936 Surveys were offered, 672 volunteered to take the survey and administered to nursed enrolled in continuing education at a large university using a convenience sample | Statistical analysis was performed using a two-sided hypothesis. Pearson chi-square test and Fisher exact test was used. The independent sample t-test (ANOVA) and binori logistic regression and ordinal regression to calculate potential difference. | There was a significant difference of knowledge between different specialties in nursing, and they were more likely to be vaccinated when there was a pandemic year compared to year with just seasonal vaccine. |
| Lindley et al., (2014) | The aim was to evaluate Rhode Island's revised vaccination regulation requiring HCWs to take the annual Influenza vaccination or wear mask. | V I | None addresses | Semi-structured interviews were conducted during the 2012-2013 influenza season from five facilities, asking 20 items about the policy, efforts to promote HCWs. Limited data pool was used since the interviews were conducted among small facilities and over 40 % did not report. | Participants were contact via email and phone and the interviews were conducted by three interviewers from an outside non-profit public health research organization. Consensus to the coding for the questions was determined by discussion. | The results were pretty similar between the facilities and most were found to have acceptance to the mandatory flu vaccination but a barrier to implementing the enforcement of wearing the mask. |
| Bridges, C., Kuehnert, | Examination of literature for factors that | V I | None addressed | Review of research articles from 2003. | Selective literature review using | The aim of handwashing is to remove transient |

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| M., Hall, C. | influence the Transmission of influenza vaccine by HCWs. | | | Systematic review | Medline, PubMed, CINAHL | microorganisms and prevent transmission |
| Toronto et al., (2010) | The purpose for this integrative review was to identify factors that contributes to the professional and personal influenza vaccination practices. The Heath belief model (HBM) | V | 5 Perceived barriers were found to be reasons that nurses did not take the vaccine; vaccine efficacy, vaccine safety, lack of knowledge, avoidance of infections, and time constraints. | Out of 129 articles, 12 articles were identified as meeting the criteria from medical journal, nursing journals and health economics. | Selective literature review using CINAHL (culminating index of nursing and allied health literature) and PubMed databases | This article with reviewed 12 studies can be very useful for the change proposal of development of a mandatory influenza vaccination program by given the nurses the education needed. |
| Zhang, et al., (2012) | To clarify the relationship between knowledge risk perception health beliefs and vaccination behaviors in nurses | I V | A cross sectional survey was conducted of qualified nurses between April 18 and October 18, 2010 on qualified nurses working at a large hospital in London using Likert scale for the questions | Statistical analysis was performed using SPSS version 15.0. The one-way between groups analysis of variance (ANOVA) was used to explore the difference between groups. The P value <0.05 was considered to denote statistical significance. | The study discovered that vaccination behaviors displayed complexity requiring an analysis of both vaccinated and those unvaccinated suggesting different strategies to improve vaccination rate and lack of knowledge was a big predictor. | Although this study was statistically significant it is applicable to the behavior change needed for increasing the influenza vaccination rate at the current time for the research. |
| Lindley et al., (2014) | The aim was to evaluate Rhode Island's revised vaccination regulation requiring HCWs to take the annual Influenza vaccination or wear mask. | V I | Semi-structured interviews were conducted during the 2012-2013 influenza season from five facilities, asking 20 items about the policy, efforts to promote HCWs. | Participants were conducted by three interviewers from an outside non-profit public health research organization. Consensus to the coding for the questions was determined by discussion. | Comparison in study noted that mandatory requirement led to acceptance to the mandatory flu vaccination but a barrier to implementing the enforcement of wearing the mask. | This article does show that by regulating the seasonal influenza vaccine to healthcare workers yearly they had an increase of 20 % vaccinated HCWs from the prior season. |
| Khodyakov et al., (2014) | The aim was to study the impact of health care personn (HCP) Influenza vaccination requirement within California. | V I | Qualitative evaluation was based on hospital case studies and 13 key stakeholder interviews between December 2011 and February 2012. | All data was coded and thematically using the MAXQDA 10 qualitative data analysis software was used to summarize themes and identify patterns. | The found a wide support for the intent of California law, that influenza vaccination of HCP was the right thing to do to ensure patient safety. | The public awareness of patient safety and health care quality are important factors from this study to use for the mandating process of the researchers paper. |

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| Winston et al., (2014) | The aim was with survey employee perception of mandated H1N1 policy with the possibility of termination if not complied. | I I | A voluntary paper survey of 202 HCWs at an urban community hospital in Chicago. It comprised of 16 questions compiled anonymously. | The results were analyzed by group differences using Pearson chi-square. Statistical significance was set at 0.05 and calculations were done with SPSS 11.5.1. | The result showed a mean age of 39.3 that responded 5.9 % had contraindication to the vaccine, 86.1% reported they received the vaccine. 54.6 % was prior to the mandate and 45.4 % took it after the mandate. | The risk for termination of employment if a HCW is not accepting the vaccine was found to be too harsh per this study. Opt out declination forms was suggested in conjunction with the mandatory process of vaccination is thought to be good option for the change proposal. |
| Al-Tawfiq, (2012). | The aim of the study was to investigate HCWs attitude and possible factors associated with vaccine acceptance | I V | 250 surveys were distributed and 161 (64.4) were completed. This was conducted during the 2009 H1N1 season. | Cross Sectional observational study by self-administered surveys by HCWs. Data was analyzed by SPSS version 10.0, and Chi-square tests. | The intention to accept the H1N1 vaccine was 31 %; in this study 36.6 % had received the seasonal influenza vaccine 2008-2009. Findings were consistent with prior studies. | HCWs acceptance of pandemic vaccination internationally is alarming. Different strategies are needed to increase awareness. |
| Prosser, et al., (2011) | The aim was to review the cost effectiveness of the pandemic influenza A(H1N1) 2009 vaccination program | I V | A decision analytic program using standard software to estimate cost and health outcome. | Cohorts of children and adults age 6 months and older where divided by age groups then divided into risk groups such as patient with co-morbid factors. Cost included direct medical cost for the influenza event, and the consumer price index 2009 was used to compare the cost | The endpoint of incremental cost-effectiveness ratio was calculated by dividing the net cost health benefits. Sensitivity | A vaccination program for H1N1 influenza vaccine for target groups can be justified from an economic perspective then indirect are not considered and assuming the vaccine supply are sufficient. |
| Thompson, et al., (2013). | Exploring the influence of a required seasonal influenza program versus traditional promotional strategies | I V | Of the 1781 completed enrolled questionnaire 4.7 % did not complete the post season questionnaire. Half of the unvaccinated HCP reported a high likelihood that they would accept the | Self-reporting intentions are not equivalent to actual behavior limiting the validity of this study. | The participant's characteristics were identified and correlated by chi-square test, and standard t-test. The analysis was conducted using IBM PASW statistics 18.0. Five potential | Limitation behavior not changed, but most likely would accept the vaccine due to policy changes. |

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| | | | seasonal influenza vaccination. | | barriers were identified. Linear regression with the 5 point influence rating as the dependent variable were done and repeated for each intervention to test the null hypothesis | |
| Benet et al., (2012) | The effectiveness of HCWs influenza vaccination controlling the hospital acquired influenza (HAI) among patients. | I I I | Categorical variable was compared by Fisher's exact test and by Mann-Whitney U-test. Conditional logistic regression was undertaken. Covariates with P <0.15 was used. | A case control study was performed using cases with virological tests that tests that confirmed influenza occurring 72 hours after admission. Using control studies from 2004-2005-2006 and 2007 were randomly selected. | Among 55 patients analyzed 11 patients had confirmed HAI. The median vaccination rate of the HCP in the unit was 36 %. The proportion of >35 % vaccinated HCW in short stay units appeared to protect against patient HAI (odd ratio was estimated to 95%) | Currently there is few statistics performed of the ratio of HCWs taking the vaccine and the likelihood to contract the HAI. This article at least is shedding some light for the change proposal being a work in progress. |
| Sullivan, et al., (2010). | This author aimed t advocate for a non-mandatory flu vaccination but supporting requirements for institutions to offer programs that aims to eliminate voluntary immunizations. | I | A review of available research and expert opinion with a conclusion based on the authors experiences and work in the field of occupational medicine. | Review of available research articles on Medline, CIANHL, randomized control studies, case studies, case reports, editorials, and expert opinions searching as far back as 1990 thru 2009. | The findings per this author was that respect for individual right to decline the vaccine for religious, medical, or philosophical reasons should be supported. | It is still a valuable article in the fact collected and requirements looked at in the perspective of HCWs personnel beliefs and rights if a mandatory program is implemented. |
| Cohen & Casken, (2012) | The aim of the study was to examine the factors that influence the HCW choice to accept the flu vaccine. | V | Literature articles reviewed were from the time frame of 1981 thru 2009. | Review of 40 studies that pinpoint the specific factors that influenced HCW decisions | Selective reviews from PUBMED, CINAHL, some articles reviewed were out dated for study | Current literature needed with updated EBP to improve information |
| Prematun ge, & et al., (2012) | A systematic review to communicate with the future planning process for influenza program. | I | Examining factors that influenza pandemic influenza vaccination of health care workers | A systematic review of a cross sectional questionnaire survey based studies. Selective reviews of | If HCW believe in the vaccine or the validity and effect was safe the probability of referring others | HCW were more likely to accept the flu vaccine, if they believed that the benefits outweighed the risks. |

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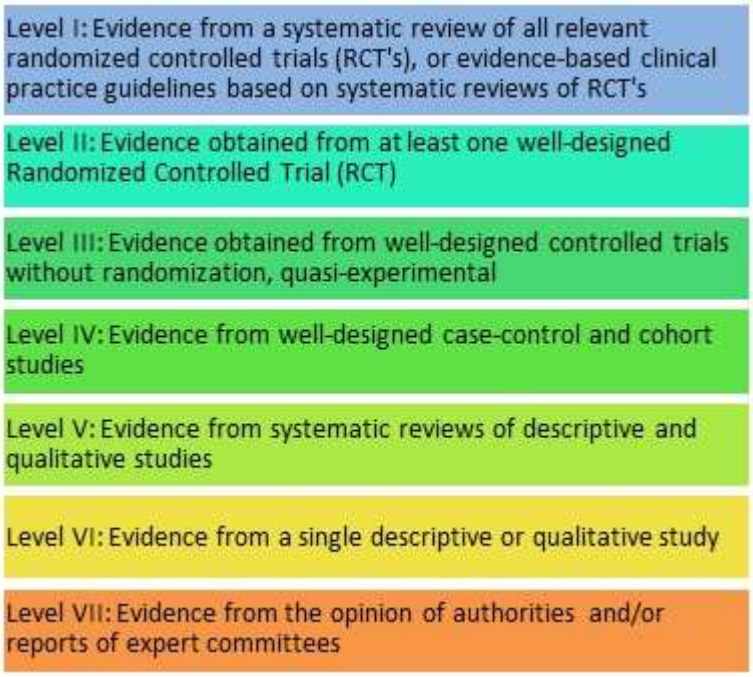
| | | | | MEDLINE, PubMed, CINAHL. | to take it would be high | |
| Vanhems & et al (2011) | The main aim of this prospective study was to estimate the risk of HA-ILI with hospitalized patients being exposure to contagious patients and HCWs with ILI in the hospital. | IV | A prospective surveillance study was performed by the infection control team between October 15, 2004, and April 15, 2007, at Edouard Herriot Hospital. | According to Vanhems & et al. (2011) Surveillance of ILI and laboratory-confirmed influenza was undertaken at Edouard Herriot Hospital (1100 beds) during 3 influenza seasons. A total of 21 519 patients and 2153 health care workers (HCWs) from 2004 to 2007 were included. The RR of HA-ILI in patients was calculated according to exposure to other contagious patients and HCWs. | Patients exposed to at least 1 contagious HCW compared with those with no documented exposure in the hospital, had a relative risks of HA-ILI was 5.48 (95% confidence interval for patients exposed to at least 1 contagious patient, the RR was 17.96 (95%) the significance was even greater if the patient was exposed to both patient and HCW who were contagious | Hospitalized patients exposed to potentially infectious patients and HCWs with ILI inside the hospital are at greater risk for HA-ILI |
| Graeve & et al., (2014) | The aim of this project was to create and pilot test of a quantitative tool for occupational health nurses to track their activities and the potential cost savings for on-site, which indicate the value of occupational health nursing services | V II | Review the role of Occupational health nurses who use their knowledge and skills to improve the health and safety of the working population; however, companies increasingly face budget constraints and may eliminate health and safety programs. OHN must now prepare service outcomes to improve safety. | A review of the literature and semi-structured interviews with occupational health leaders from a major Midwestern city were conducted to identify tools that estimate the economic value of occupational health nursing services. A sample of five occupational health and safety professionals with nursing backgrounds employed in leadership roles in their organizations | The findings from the interviews revealed key themes about the potential value of health promotion and prevention programs and the importance of documenting occupational health nurses worth of decreasing costs for employers. | Future research could explore how occupational health professionals might affect the health of employees with limited access to primary care providers. What additional tools can the OHN achieve to reach autonomy to decrease health cost to the employer |

Appendix B: Evidence-Based Practice: Step by Step: The Seven Steps of Evidence-Based Practice




(Melnyk, Fineout-Overholt, 2005, p. 10)