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An Evidence-Based Strategy to Improve Influenza Vaccination Rates Among Registered Nurses in Hospitals

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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, Walden University, 2009

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Project Submitted in Partial Fulfillment

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Abstract

Seasonal influenza, or the flu, impacts over 3 million people each year. Within the health sector, nosocomial infection and absenteeism are frequently associated with the flu. The Centers for Disease Control and Prevention (CDC) recommend flu vaccination for all eligible individuals, especially health care workers (HCWs). Interventions associated with increased HCW vaccination include educational programs and occupational health campaigns to address misconceptions regarding vaccine safety and efficacy. This project evaluated the impact of a voluntary, web-based education module to encourage registered nurse (RN) vaccination. The logic and health belief models served as the theoretical frameworks. In a nonequivalent group design, an educational program addressing evidence-based barriers to vaccination was delivered at 1 acute-care hospital and was not delivered at a comparison hospital within the health system. A total of 192 surveys (116 at intervention facility) were returned over 3 weeks. Statistically significant differences ($x^2 = 7.210$, $p = 0.007$) were found for RNs who accepted influenza vaccination after education when compared to the RNs not receiving education. The 15% higher vaccination rate for RNs receiving education (91.1% vs. 76.1%) translates into more than 100 additional vaccinated RNs if applied across both hospitals. This project found that a simple but tailored web-based educational program is effective in converting RNs to vaccination acceptance. Increased vaccination produces societal change by reducing nosocomial and community influenza transmission. Reduced influenza infection improves community health as well as patient safety. Future work should address community-wide HCW education initiatives and evaluate their impact on quality and financial indicators at the hospital and community levels.

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Dedication

This quality improvement project is dedicated to my devoted husband, Dane Sr.; son, Dane Jr.; and parents, Robert and Doris Simpson. Their undying support during this process was critical to my overall academic success. Thank you all for your love and understanding for many missed family activities and vacations over the past several years. Lastly, I also dedicate this project to all my friends and colleagues who became my driving force throughout my entire course work.

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The completion of this project has taken many years of dedication and commitment personally and professionally. However, my success would have not been possible without the support, encouragement, and guidance of many colleagues, friends, and family members. I extend my deepest gratitude and appreciation to all of them. Additionally, I am indebted to Inspira Health Network, which has afforded me many academic opportunities resulting in career growth. I would like to thank and acknowledge my preceptor, Elizabeth Sheridan, for her support and inspiration throughout the years. Ms. Sheridan was an outstanding preceptor and mentor from start to finish of the Doctorate of Nursing Practice program. Finally, I want to acknowledge Sami Abate, Director of Research, who provided me friendship, encouragement, and tutoring in writing. Ms. Abate dedicated countless hours to assisting me with the completion of a successful project.

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Section 1: Overview of the Evidence-Based Project

Introduction

Health sector leaders are challenged with protecting health care workers (HCWs) and their patients from infectious diseases, in particular the highly contagious influenza virus. Although specific figures are not available, numerous researchers have reported that HCWs are often at a higher risk for higher incidence of contracting and spreading the influenza virus because they are exposed both in the community and in the workplace. Additionally, HCWs are not aware of the implications and consequences of the spread of the flu among many vulnerable populations (Hofmann, Ferracin, Marsh, & Dumas, 2006; Zhang, While, & Norman, 2011). The probability for large-scale influenza outbreaks among HCWs creates financial, quality, and safety concerns for all stakeholders.

Health care organizations are responsible for fostering healthy and safe environments. However, both health and safety are compromised by the increased absenteeism associated with seasonal influenza outbreaks (Anikeeva, Mayer, & Rogers, 2009). According to Real, Kim and Conigliaro (2013), preventing the spread of flu in the hospital setting is an important patient safety concern. The alarming rate of influenza vaccine declination, frequently > 50%, continues to be a challenge for health care organizations (Hofmann et al., 2006). The intent of this project was to implement a theory-driven, evidence-based professional web-based education program targeting registered nurses (RNs) to increase influenza vaccination rates. Through increased RN vaccination, there will be less patient risk for secondary influenza exposure and decreased RN influenza-related sick leave. Furthermore, the hospital-level benefits will translate into a positive impact on the larger community.

Background

Fuhrmann (2010) stated that flu has the potential to impact nearly half of the world's population and cause substantial mortality and morbidity during severe pandemic outbreaks. According to the Centers for Disease Control and Prevention (CDC, 2013a), the World Health Organization (WHO) reported that 3-5 million severe cases of flu occur each year, which result in 250,000 to 500,000 deaths, the majority of which occur in adults over 65 years of age. Although specific data were not provided, the WHO reported that HCWs are at increased risk of contracting and spreading the virus to coworkers, patients, visitors, and their own family members.

Existing literature and guidelines overwhelmingly suggest that HCW vaccination is the most effective method to prevent the spread of influenza in the health care environment (Spoltore, 2014). As of 2011, the influenza vaccination rate for American HCWs was 63.5%, well below the national goal of 90% (Healthy People 2020, 2013; Nowalk, Lin, Raymund, Bailor, & Zimmerman, 2013). The rate for RNs was as low as 44.9% in one large study (Zhang, While, & Norman, 2011). In support of the vaccination goal, the CDC, the Advisory Committee on Immunization Practices (ACIP), and the Health Care Infection Control Practices Advisory Committee (HICPAC) recommend that all HCWs receive annual vaccination. To that end, organizations should consider vaccination programs that include HCW education and an electronic system of data collection for monitoring vaccine compliance (CDC, 2014a).

Researchers have identified a relationship between lack of knowledge about vaccines, attitudes toward influenza vaccination, misconceptions about vaccine safety and efficacy, and vaccine practices among HCWs (Canning, Phillips, & Allsup, 2005;

Willis & Wortley, 2007; Zhang, While, & Norman, 2010; Zhang et al., 2011). Recent work by Real et al. (2013), provided insight into HCWs' knowledge and beliefs about their risk of influenza, the efficacy of vaccination, and the impact of both on absenteeism and patient safety. For example, researchers discovered that individuals who had contracted flu (despite previous vaccination) and those who could not conveniently access vaccine clinics were much less likely to accept vaccination. Health care leaders have crafted influenza education and vaccine programs to target high-risk-for-refusal groups.

Problem Statement

The problem addressed by this project was the need for a formal educational program focused on motivating RNs to seek influenza vaccination. Studies indicate that the best practice for preventing influenza in the health care environment is vaccination of all HCWs (Abramson, Avni, Levi, & Miskin, 2010; Akker, Hulsher, Verheij, Dalhuisen, Delden, & Hak, 2011; Buynder, Konrad, Kersteins, Presotn, Brown, Keen, & Murray, 2015). Despite this fact, the rate of HCW influenza vaccination remains at only 63.5% (Nowalk, Lin, Raymund, Bailor, & Zimmerman, 2013), well below the 90% national goal (Healthy People 2020, 2013). This deficiency is unacceptable, as hospital-acquired influenza harms patients yet is preventable. Health care organizations are not focused on implementing the evidence-based recommendations and strategies necessary to protect their patients and to prevent HCWs from avoiding vaccination (Healthy People 2020, 2013; Nowalk et al., 2013).

Common reasons for vaccine avoidance among HCWs include misconceptions about vaccination side effects, the belief that HCWs have better immune systems, and the

perception that HCWs are less likely to transmit the virus to others with whom they come in contact (Canning, Phillips, & Allsup, 2005). Additionally, lack of knowledge about influenza vaccine safety, vaccine efficacy, the need to vaccine even in the absence of high-risk conditions, and the role of vaccination in protecting others were identified as contributing factors for vaccine declination rates as high as 40% among RNs (Corace et al., 2013; Jennings & Burant, 2013; Nowalk et al., 2013). Failing to recognize vaccination as a protective measure for others has a significant impact on the nursing profession. This practice demonstrates that RNs are not engaging in their profession's century-long commitment to protect patients and communities from sickness and harm through health promotion and communicable disease prevention programs.

Purpose Statement

The purpose of this quality improvement project was to improve influenza vaccination rates among RNs at Inspira Health Network, Medical Center Vineland (IHNV), an acute-care hospital in a rural New Jersey, with a web-based professional education program focused on science about influenza, risk to patients, and vaccine safety and efficacy.

Mission Statement

The Inspira Health Network's mission is to "provide high quality health services that improve the lives of all we serve" (Inspira Health Network [IHN], n.d.). As a Det Norske Veritas (DNV) accredited health care organization, the Inspira Health Network is committed to supporting a culture of continual performance improvement and patient safety. The influenza education program's mission was to provide an evidence-based professional education program to improve vaccination rates among RNs. This DNP

project was aligned with the organizational philosophy of continual performance improvement, as the professional education was developed to increase the number of RNs choosing to vaccinate. Additionally, increased RN vaccination would promote greater quality and safety of care provided to patients by reducing influenza transmission and absenteeism related to RN influenza.

Project Goal and Objectives

Project goals and objectives were developed in accordance with the project hypothesis that a professional education program would increase vaccination rates among participating RNs. Future goals include increasing vaccination rates above the national goal of 90% across the organization and consequently decreasing nosocomial influenza transmission and/or absenteeism. The project objectives included the following:

1. Develop and implement a web-based educational program (addressing the health belief model's elements of susceptibility, severity, and benefits) that addresses common perceptions, beliefs, and information about the influenza virus and influenza vaccination.
2. Develop a data collection tool to measure influenza vaccination rates for RNs at IHNV.
3. Measure the effectiveness of the education program through vaccination rates in a convenience sample of a population of RNs at IHNV.
4. Develop a dissemination plan to report the program evaluation in order to inform the organization about the outcome and to inform future studies.

The health belief model (HBM) has been shown to be useful in guiding interventions designed to improve the wellness and disease prevention behaviors of individuals,

including RNs. The HBM and its application to this project are discussed further in the literature review section of this paper. The adoption of the logic model, according to Kettner, Moroney, & Martin (2013), guides the flow of a project in an orderly manner and provides a framework for outcome measurement. Additionally, the logic model helped in identifying the difference between the short- and long-term impacts and outcomes of the program. A summary of the goals and outcomes identified in the logic model for the influenza virus and vaccination educational program is presented in Figure 1. The short-term outcomes assessment included the analysis of the influenza vaccination rates of the sample population of RNs at IHNV (where education was offered) as compared to Inspira Health Network Elmer (IHNE; where education was not offered). The long-term outcomes of the program could be assessed through overall improvements in vaccine rates over previous years, sustainability of these improvements, and influenza vaccination rates that eventually meet the 90% national goal. In the future, the impact of these outcomes could be assessed through a reduction in absenteeism of RNs and health care workers, reduction of hospital-acquired infections, and reduction in cost associated with care related to the influenza virus.

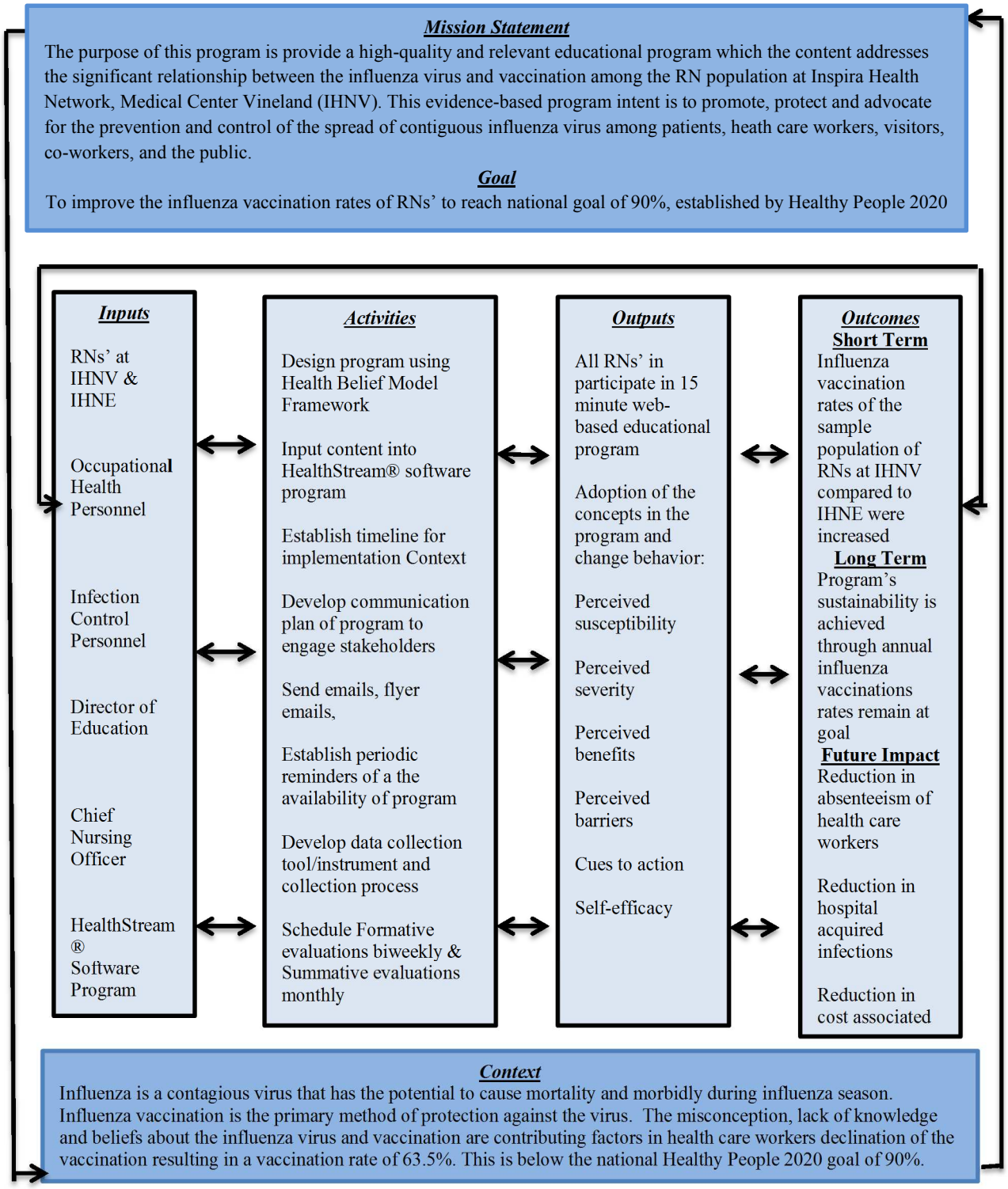

Figure 1. Logic model for the influenza virus and vaccination educational program.

Needs Assessment

In a 2014 interview with Ms. Elizabeth Sheridan, Chief Nursing Officer, the need to improve influenza vaccination rates among the employees in the organization was identified as an organizational priority. This priority was discussed in detail during an Influenza Vaccine Summit, which I attended. Ms. Sheridan served as the facilitator of this summit which reviewed historical vaccination data in comparison to national goals, past initiatives, and plans for the upcoming campaign. Ms. Sheridan acknowledged awareness of the 90% vaccination compliance goal for hospitals. Despite awareness, Ms. Sheridan stated that the organization's 48% vaccination rate had remained significantly below the national goal for the past two influenza seasons. Ms. Sheridan understood the impact of infection on the organization, including the increased risk for hospital-acquired influenza. The impact of the influenza virus was realized through high rates of absenteeism, financial burdens associated with medical care for ill employees, and adverse staffing issues, all of which were included in the influenza summit held within the organization. As the most senior nursing leader at IHNV, Ms. Sheridan was committed to improving influenza vaccination rates through implementing an education program (E. Sheridan, personal communication, August 20, 2014).

For the purpose of this project, the RN intervention population included all RNs at IHNV, ranging from clinical bedside RNs to nursing leaders. A nonequivalent comparison group included nurses at levels working at Inspira Health Network Elmer Medical Center (IHNE). The RN population was selected because, collectively, RNs comprise the largest portion of the organizations' workforces (701 of 1,128 employees at IHNV and 367 of 582 employees at IHNE). With the assistance of the occupational

health nurse manager and infection control department director, influenza vaccine rates for IHNV employees were accessed from the National Healthcare Safety Network (NHSN) database. The data showed that 48% of RNs declined vaccination in 2014, making them the most commonly unvaccinated professional discipline in the organization. This disturbing rate was believed, according to Ms. Sheridan, to result from lack of a formal education program along with the minimal attention to the influenza virus and vaccination for HCWs (E. Sheridan, personal communication, August 20, 2014).

The involvement of key stakeholders (including the target RN population, senior leaders, and leaders from the education, infection prevention and occupational health departments) was vital in determining the critical concepts, behaviors, perceptions and understanding that needed to be included in the content of the program. For example, senior leaders were needed to identify the scope of the project and provide approval for its implementation, while the director of education was essential in designing an education program compatible with the organization's learning and development structure. Both occupational health and infection prevention personnel were needed to validate the need for the program (by accessing vaccine data) and actively participate in data collection (survey collection).

IHNV recognizes the need to remain focused on new, innovative quality and safety improvement initiatives that apply across many disciplines in the organization. The organization acknowledged that quality is fundamentally important and is increasingly being tied to payment methods. Additionally, third-party performance rankings (such as Leapfrog © grades or CMS star ratings) of health care organizations are

critical to organizations' future competitive position as well as organizational viability and sustainability. According to Lu et al. (2013), effective vaccine promotion strategies not only directly improve patient outcomes, but also decrease flu-related absenteeism. These strategies assisted with organizational management of the spread of influenza virus among HCWs in the practice setting.

Evaluation of available required organizational resources, including time, compensation, and personnel, was necessary to ensure that the project could be completed as planned. Although resources were required for this project, they were minimal in comparison to the resources consumed as a result of flu. For example, the cost of absenteeism associated with flu decreases productivity and a places an additional flu-related financial burden on society (Keech & Beardsworth, 2008). National estimates indicate that between 10% and 12% of all employee absences annually are related to the influenza virus, with most flu absences requiring up to 6 days of missed work (Curran, 2012).

In recent studies, seasonal flu outbreaks resulted in more than 100 million days in which patients were confined to their bed, 200 million days of diminished productivity and 75 million days of absenteeism. Even when patients with the flu do report for duty, the illness and its symptoms result in a 20-40% decline in reaction time, subsequently increasing the risk of error or injury (Getsinger, 2014). The cost of this lost productivity can be staggering. For example, researchers reported that the 2010-2011 influenza season was responsible for $7 billion in lost wages and $10 billion in lost productivity (Curran, 2012). This loss is further compounded by the "presenteeism" phenomenon in which ill workers report to work but are unable to complete job tasks secondary to their symptoms

(Mauer, 2013). Some estimates place the annual total cost of influenza at $87.1 billion annually (National Business Group on Health [NBGH], 2010). At Inspira Health Network, the chief nursing officer (CNO) voiced similar concerns relating to cost and lost productivity among all hospital personnel, but most specifically the nursing staff.

This program was designed to maximize return on investment by using structures, resources and processes already present in the organization. For example, the organization's current internal web-based structure for professional development and training, HealthStream®, was used to deliver the professional educational module. The Infection Control and Occupational Health Department provided resources (in the form of trained personnel) to help with oversight of the training, including reporting of how many RNs in each department participated and the process of administering project surveys during vaccine clinic sessions. Neither activity (web-hosted training or monitoring) was anticipated to incur notable costs. The educational program was developed as part of the DNP Program Practicum, eliminating expense to the organization. The total program cost was less than $4,000, substantially lower than national estimates of $40,000 (Buynder et al., 2015).

According to Getsinger (2014), the cost an individual flu vaccine ranges from $25-$29 per injection. In a well-designed study, Anikeeva et al. (2009) noted that vaccine programs are cost effective and can provide a positive return on investment by decreasing the costs associated with absenteeism and the cost of care provided to ill staff members. The project budget revealed that even when staff compensation for completing education and the cost of vaccines were included, the fiscal resources needed for project implementation were relatively low; the favorable return on investment documented

above ($2.58 per dollar invested) ensured the program's strength and sustainability. A financial analysis that considers both the cost and benefits of achieving results aids in justifying resource allocation during all phases of a project from planning to implementation to outcomes monitoring (Kettner et al., 2013). A project budget is provided in Table 1.

Table 1

Influenza Vaccination Education Program Revenue and Expense Budget

Cost description	Fixed expenses	Variable expenses
HealthStream® annual fee	$2,500	0
Supplies for flyers and survey		$100
Lock box for survey		$50
Project development (student's own time)	$1,200	
Completion of education program (by RN population)	20 minutes * 145 RNs * $27.05 (average RN salary) = $1,307	
Total	$5,007	$150
Total expenses	$5,157	

Revenue	
Vaccinating employees and reducing absenteeism can save employers $2.58/employee x 701 RN participants	$1,808.58
Average cost of 1 flu-related geriatric hospital admission (Peasah, Azziz-Baumgartner, & Breeze et al., 2013)	$9,839
Potential revenue (if one admission is avoided)	$11,647.58

Total expenses	
Potential revenue	$11, 647.58
Less expenses	$5,157
Equals	$6,490

The SWOT analysis (strengths, weaknesses, opportunities, and threats) used in previous influenza project work (e.g., Uscher-Pines, Barnett, Sapsin, Bishai, & Balicer, 2008) identified key areas that were ultimately considered in determining the project's success. The complete SWOT analysis is provided in Figure 2. The project's strengths included the existing organizational resources and executive leader commitment. Weaknesses and threats of the project included an attempt to reach a large population in a limited time period. The population size and time limitations are addressed in the sample population section of this document.

Strengths • Resources and people • Existing data and database • Practice setting • Low cost • Leadership commitment	***Weaknesses*** • Large target population • Timeline • Gap in capabilities to reach target population • No existing educational method
Opportunities • Technology and innovation • Global and societal influences • National organization • Policy change • Political activism	***Threats*** • Loss of key staff stakeholders • Sustaining internal capabilities • Seasonality of program • Other organizational projects/initiatives

Figure 2. Strengths, weaknesses, opportunities, and threats.

IHNV is a progressive organization that had many new initiatives and projects taking place simultaneously with the implementation of this program. This program's contribution to improving employee health and wellness was highlighted to gain global recognition of its importance. This project benefited the organization by improving influenza vaccine uptake. The positive outcomes of the project were translated into health practice changes for the organization, with potential impacts at the local, state, and national levels. This was accomplished through the dissemination of the project's results for future use by others for potential policy.

Significance to Practice

The ability of this health care organization to improve the health and wellness of its RNs is critical to decreasing absenteeism, the consequences of which (higher nurse-patient ratios, temporary workers) can compromise patient outcomes. Initiatives to prevent the spread of influenza virus have the capacity to facilitate quality and financial outcomes, including reduction of hospital-acquired infections and employee-acquired infections, thereby reducing length of stay and absenteeism for this organization. In the future, improvements in RN vaccination rates that are linked to the educational program can subsequently be evaluated for further impact on related quality and financial indicators. The project findings provided significant insight into the use of an evidence-based and theoretically informed approach to improve influenza vaccination among RNs.

Hypothesis and Project Question

The hypothesis for this project was the following: A structured influenza vaccination educational program will improve influenza vaccination rates among an RN population in an acute care setting. The project question was: How can the

implementation of an internal web-based educational program impact the RN influenza vaccination rate in an acute care setting as measured by the vaccine uptake rate (lower vaccine declination rate) in RNs receiving education (intervention group) as compared to RNs not receiving education (comparison group)?

Evidence-Based Significance of the Project

In a rapidly changing health care environment, leaders are faced with financial constraints, workforce reductions, redesigns, and changing consumer expectations. Organizations need to adopt evidence-based practice initiatives to respond to contemporary quality, safety, and financial demands. The dissemination of best clinical practices provides organizations with guidance to implement strategies to improve employee health, patient safety, and quality outcomes.

Literature that describes the influenza vaccine knowledge and beliefs associated of HCWs in general, and RNs in particular, abounds. The evidence to support the implementation of strategies to increase HCW influenza vaccination rates is extensive and strong (Corace et al., 2013; Jennings & Burant, 2013; Llupia, et al., 2013, Real, Kim, & Congigiliaro, 2013). However, little literature exists that demonstrates the impact of using a conceptual framework such as the health belief model to influence RNs' health behavior changes regarding influenza vaccination (Corace et al., 2013; Jennings & Burant, 2013). The deficit of a guiding theory in the development of vaccine promotion programs may be one reason for continually low RN vaccination rates. According to Real et al. (2013), health promotion programs are more successful when they are guided by appropriate behavioral theories.

Researchers addressing the challenges and barriers for vaccination rates among HCWs using evidence-based interventions have yielded significant improvements, with vaccination rates increasing from 40% to 87.4% (Nowalk, et al., 2013). These interventions have included free onsite influenza vaccine clinics, education, incentives, and feedback sessions to report vaccination rates (Nowalk et al., 2013). Similarly, Corace et al. (2013) found that providing educational and promotional campaigns improved vaccine uptake.

The aim of this project was to improve the influenza vaccination rates of RNs in two hospitals to reach the national goal of 90%. This was achieved through the development of a web-based educational program tailored for RNs with evidence from the literature. The program used content recommended by the CDC and ACIP and addressed susceptibility, severity, common barriers to vaccination, and the benefits of vaccination. The significance of this project, a tailored educational program, further evidenced the need to bridge a substantial gap between influenza virus knowledge and vaccination uptake among a specific population of HCWs.

Definitions of Terms

The key concepts and terminology identified in association with this project include the following:

Registered nurse: A registered nurse (RN) is an individual who has graduated from a nursing program and has passed a national licensing exam to obtain a nursing license. The scope of practice is made and regulated by local legislative governing professionals. A *direct caregiver* is defined as a health professional that performs care directly for a specific patient population. A *nondirect caregiver* is a licensed health care

provider who performs activities related to health care but does not directly deliver care (American Nurses Association [ANA], n.d.).

Health care worker (HCW): Health care workers include individuals who work in health care settings and can be exposed to infectious material. These workers include doctors, nurses, patient care staff, ancillary providers, and non-patient-care staff who come into contact with potentially infectious agents (CDC, 2014b).

Influenza virus: Influenza is an acute viral infection that spreads easily from person to person. In temperate regions, influenza epidemics occur almost annually. As a contagious viral infection, influenza has varying viral strains that cause significant morbidity and mortality in vulnerable patients. This viral infection attacks the respiratory system including the nose, throat, and lungs. Influenza, commonly called the *flu*, is not the same as the stomach "flu" viruses that cause diarrhea and vomiting (CDC, 2013a; Real et al., 2013).

Influenza vaccination: An *annual seasonal flu vaccine*, in the form of a flu shot or nasal spray, is an annual vaccination using a vaccine specifically for protection against the highly virulent influenza virus. The annual seasonal influenza vaccine is composed of antigens for three or four virulent influenza virus strains. The flu vaccines cause antibodies to develop in the body about 2 weeks after vaccination; in turn, antibodies provide protection against infection with the viruses that are in the vaccine (CDC, 2014a).

Influenza declination form: A signed form of understanding that is completed during the seasonal influenza period and serves numerous purposes. This document states that the employer has offered the influenza vaccination to employees who work in a

health care environment that places employees, patients, and coworkers at risk of exposure to the influenza virus. It denotes that the employee has received and understands information given about the risks and benefits of the vaccine. If an employee is eligible for the influenza vaccination and declines it, risk and complications are acknowledged on the form. The form also acts as a waiver for those employees who are not eligible to receive the vaccine, the criteria for which are clearly defined within the form's content (Quach et al., 2013; Talbot, 2009).

HealthStream®: Software program that is a collection of available learning programs that are used in health care settings for training and learning management, talent management, performance assessment, credentialing, and managing simulation-based training programs. The use of this software allows professionals to use, schedule, assign, track, and report online learning. HealthStream® provides capabilities that help health care organizations measure and evaluate performance in support of organizational objectives (HealthStream®, n.d.).

Assumptions

One assumption made for this project was that all RNs identified in the targeted population who participated were truthful about their participation in the education and accurately reported their vaccination status. Another assumption was that participants were truthful in reporting their organizational roles. Inaccurate reporting of roles (e.g., a clinical nurse reporting that he or she is a nurse manager or a nurse manager reporting that he or she is a non-clinical nurse) could impact results, as clinical and non-clinical nurses, or leaders and non-leaders, could have different views of their risk of contracting influenza based on their differing personal or professional experiences. These differences

could impact vaccine decisions. It is suggested that these assumptions be addressed through future projects and studies.

Summary of Section 1

Seasonal influenza is a serious and costly public health concern. National organizations such as the CDC and APIC recommend vaccination for all eligible individuals for the prevention of influenza transmission. Vaccination rates of at least 90% are recommended for HCWs to prevent nosocomial transmission and to lower the risk of outbreaks among staff, which can have serious patient care and financial implications. Despite this recommendation, vaccination rates remain low, particularly among RNs. This section has also introduced an influenza virus and vaccination education program targeting a convenience sample population of RNs in an acute care setting. The professional educational program addressed key elements identified as having been successful in improving vaccination rates among RNs, particularly information regarding the safety and efficacy of influenza vaccines. The professional educational program presented here also uses elements of the HBM, such as severity, susceptibility, and benefits. Additionally, this section has included key associated terms and definitions, project assumptions and noted limitations. Lastly, this section has presented the significance of this evidence-based project and its relationship to improved outcomes for both the practice setting and society.

Section 2: Review of Scholarly Evidence

Introduction

Health care organizations recognize the need to improve influenza vaccination rates among HCWs, as low rates are linked to hospital-acquired infections, staffing issues, and dissatisfaction for stakeholders. The purpose of the project was to offer an influenza vaccine professional educational program in a web-based format tailored to a convenience sample populations of RNs in one acute care setting and evaluate its effectiveness by comparing the vaccination rates of these RNs to the vaccination rates of a similar group of RNs in a separate acute care setting (where the education was not offered). Numerous studies (Anikeeva, Mayer, & Rogers, 2009; Canning, Phillips, & Allsup, 2005; Clark, Cowan, & Wortley, 2009; Corace et al., 2013; Hollmeyer, Hayden, Poland, Bucholz, 2009; Ofstead et al., 2008) have demonstrated that HCWs' perception, knowledge, and beliefs about the influenza virus and the vaccination impact their decision making. The intended project outcome was to promote positive change in future decisions concerning vaccine uptake among this population. This section of the project presents the literature review for the key theories, models, concepts, and terms.

Literature Search Strategy

For the project, six electronic databases were accessed to perform a comprehensive literature review, including Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, PubMed, EBSCO, Ovid Plus, and Cochrane Library. The selected key search terms included *influenza virus*, *influenza vaccination*, *declination of influenza vaccination*, *health care workers*, *health promotion theories*, and *influenza vaccination education*. In the search, Boolean terms *and*, *or*, and *not* were used

to increase accuracy in locating applicable literature as well as to omit irrelevant unrelated papers. Papers and studies published between the years 2005 and 2014 were eligible for inclusion, provided that they met any of the following criteria: systematic review of literature, quantitative research, qualitative research, mixed method study, peer-reviewed best practice recommendation, or theory-based report. Inclusion criteria did not exclude international studies or studies published in health care settings other than acute care hospitals. Excluded from the search were abstracts, dissertations, electronic media, and unpublished research. In total, 242 citations were located and selected for the initial abstract review. Of these, 213 abstracts were excluded based on the described criteria, leaving a total of 29 articles (three randomized controlled trials (RCTs), 19 non-randomized trials, and seven reports of evidence-based practice projects) included in this review of scholarly literature.

Influenza Virus

Influenza virus is an acute viral infection that spreads easily from person to person (CDC, 2013b). In temperate regions, influenza epidemics occur almost annually, with widespread infection typically occurring during the winter season months: November to March in the Northern Hemisphere and May to September in the Southern Hemisphere (Fuhrman, 2010). As a contagious viral infection, influenza has varied strains that cause serious sickness in vulnerable populations (Real, 2013). Influenza, commonly called the *flu*, is not the same as the stomach "flu" viruses that cause diarrhea and vomiting (Fuhrman, 2010; Real et al., 2013; Zhang, While, & Norman, 2012). Instead, the infection adversely impacts the respiratory system, including the nose, throat, and lungs.

The results are fever, malaise, excessive mucous production, and compromised ventilation.

The CDC collects and analyzes population health data for health problems using person, place, and time, or a method for influenza surveillance. Older adults, very young children, pregnant women, and people with chronic medical conditions are at the highest risk for serious influenza-related complications (CDC, 2013a). Furthermore, Lu et al. (2013) found that adults between the ages of 25 and 64 who were unemployed or of low socioeconomic status were at 24.8% higher risk for the virus than individuals who were employed or were of a higher socioeconomic status. In addition, this group was less likely to seek medical attention for viral symptoms or to receive vaccination.

Influenza is serious disease impacting many Americans each year. The reported annual incidence of influenza cases is 36 cases per 100 individuals or 35 million to 50 million cases annually. In fact, approximately 25% of the U.S. population exhibits the signs of influenza annually. An average of 20,000 to 40,000 deaths related to influenza complications occur every year (National Institute of Allergy and Infectious Diseases [NIAID], 2014).

The practice environment is an area of concern for influenza virus transmission among patients, visitors, and HCWs. In fact, HCWs are considered a vulnerable population for flu (Anikeeva, Mayer, & Rogers, 2009). Additionally, patients with compromised immune systems who present for health services are greater risk for influenza exposure as well as other healthcare-associated infections (HAIs). Researchers (Clark, Cowan, & Wortley, 2009; Efstathiou, et al., 2011) have identified that lack of compliance with preventative measures (i.e., those adopted as standard practices)

contributes to transmission of HAIs such as influenza. According to Sessa, DiGiuseppe, Albano, and Angetillo (2011), HAIs are a common public health concern around the globe and can result in increased cost, mortality, and morbidity.

Influenza Vaccination

Early in the 20th century, the influenza virus and related illnesses were identified as the leading cause of mortality in the United States. By the end of the century, the influenza virus fell to the sixth leading cause of mortality, demonstrating the effectiveness of improved vaccines and vaccination programs (Hood & Smith, 2009). In 1981, the CDC determined that the influenza vaccination is the primary method of preventing influenza flu for all HCWs in the health care setting (CDC, 2014a). Since this time, the effort to limit the spread of influenza in health care organizations has focused on vaccinating HCWs.

Many prominent organizations, such as ACIP, WHO, and NIAID, jointly recommend and actively promote influenza vaccination as the primary preventative means for HCWs and RNs to protect against contracting the virus and to limit the spread of the virus. Furthermore, the vaccination method controls the spread of the virus to patients, visitors, co-workers, and family members. Therefore, organizations need to focus on vaccinating all HCWs as the primary means of illness prevention and wellness promotion (CDC, 2014a).

The annual, or seasonal, influenza vaccine is composed of antigens for three or four virulent influenza virus strains. The flu vaccines cause antibodies to develop in the body about 2 weeks after vaccination; in turn, antibodies provide protection against infection with the viruses that are in the vaccine. Health care organizations are

responsible for providing the influenza vaccination to all accepting employees. As noted by Kaboli et al. (2010), HCWs, including RNs, are considered a vaccine priority in many countries, especially in the case of flu pandemics.

Influenza Vaccination Rates

Health care organizations are encouraged by the CDC to report their influenza vaccination rates to the National Healthcare Safety Network (NHSN; Centers for Disease Control Division of Healthcare Quality Promotion, n.d.). The denominator for the NHSN influenza vaccination is all HCWs, including any individual who meets the following criteria: direct exposure to patients or infectious materials, potential for indirect exposure to patients or infectious materials, and paid or unpaid, an employee, contractor, volunteer, visitor, or student (CDC, 2014b; Quach et al., 2013). According to the National Center for Health Statistics (NCHS), approximately 53% of HCWs were vaccinated in a flu season (2008-2009; Healthy People 2020, 2013). Vaccine rates in HCWs are remarkably low in other countries and settings as well. For example, a 2003 Spanish National Health Survey revealed that only 19.65% of HCWs were vaccinated against influenza. This was substantially lower than American HCW rates (40.1%) reported during a similar time period (Jimenez-Garcia, Hernandez-Barrera, Carrasco-Garrido, Sierra-Moros, & Martinez-Hernandez, 2006). Research specific to the vaccine behaviors of RNs shows considerable variability with the vaccination rates of RNs sometimes reported to be higher than the those of other HCWs, as high as59% in some studies (Clark, Cowan, & Wortley, 2009), but reported as lower (sometimes as low as 37.0%) in other studies (Zhang, While, & Norma, 2012).

Healthy People 2020 (2013) provided a summary of objectives for influenza prevention that included a goal of 90% HCW vaccination, consistent national vaccination programs and policies, and the establishment of a national data source. However, the rate of declination among HCW remains below this goal at 63.5%. Moreover, compliance rates among the RN population specifically were reported at an average of 40%, with the lowest rates among administrative and non-clinical support staff (59.1%) and assistants or aides (46.6%; Toronto & Mullaney, 2010).

HCWs' Influenza and Vaccine Knowledge and Beliefs

Recent works have sought to identify and/or describe HCWs' knowledge and beliefs about influenza risk, infection, and vaccination (Hollmeyer et al., 2009). Despite chronically low vaccine rates, at least one study found that RNs are acutely aware (95%) of the severity of an influenza infection. Further, RNs were at least minimally aware of vaccine recommendations and vaccine effectiveness in preventing influenza transmission to patients (Clark, Cowan, & Wortley, 2009). However, in a cross-sectional survey of nurses (n = 144) in the United Kingdom, apathy was determined to be a primary barrier to vaccination (Canning et al., 2005). Although only 7.6% of surveyed nurses accepted influenza vaccination, those accepting were more likely to report that they expected that the vaccination would be more likely reduce absenteeism (44%) than to prevent an influenza infection (28%). Similarly, a focus group study of RNs in Alabama and Michigan *(*n = 71) found that inaccurate beliefs about vaccine safety are commonly reported among RNs in those who receive as well as those who decline vaccination (Willis & Wortley, 2007). In addition, vaccination recommendation awareness was found to vary between groups, with more vaccinated RNs being aware of the

recommendation. Three common precipitators of vaccine acceptance reported in the literature were prior year's vaccination, belief in vaccine efficacy, and advancing age and the presence of a chronic health condition (Clark et al., 2009; Hollmeyer et al., 2009).

Declination and Impact

During the seasonal influenza period, it is highly recommended that HCWs receive the influenza vaccination. Prior to receiving the vaccination, HCWs need to sign a consent form to verify that they understand the risks and benefits of the vaccine. If a HCW is eligible but opts to decline vaccination, the risks and complications are acknowledged on the form. The form also acts as a waiver for those employees who are not eligible to receive the vaccine, and the applicable criterion is clearly defined within the form's content (Quach et al., 2013). Despite evidence indicating the safety of immunizations, vaccine safety was cited as a leading concern among RNs who chose and chose not to vaccinate (Willis & Wortley, 2007).

A literature review of 29 studies published from 2005 to 2015 revealed that the decline in influenza vaccination among HCW has been primarily related to misconceptions, personal beliefs, and a lack of understanding about the influenza virus and vaccination safety (Corace et al., 2013; Real et al., 2013; Zhang et al., 2012). Concerns about vaccination-related adverse events were also commonly reported (Clark et al., 2009). The reasons for HCWs choosing to decline vaccination are similar in the hospital and ambulatory settings (Hollmeyer et al., 2009).

A lack of vaccine campaign awareness has been associated with vaccine declination, whereas convenience of administration has prompted vaccine acceptance (Hollmeyer et al., 2009; Willis & Wortly, 2007). In a study of English nurses and

healthcare assistants (*n*=144), the most commonly reported reason for vaccine declination was the belief that it was unnecessary (29%); other reasons included lack of awareness and concerns about side effects (Canning et al., 2005). Incidental findings also noted that HCWs believed that their immune systems were stronger than average due to previous occupational exposure (Clark et al., 2009).

Interestingly, when HCWs decline influenza vaccination, the impact is felt well beyond the workplace. For example, RNs in focus groups (*n*=71) recognized that their decision not to vaccinate directly impacted the decisions of patients, families, and colleagues (Willis & Wortly, 2007). However, those declining vaccination are more concerned for their well-being than for the well-being of others (Clark et al., 2009; Hollmeyer et al., 2009). Furthermore, the RNs who reported that their patients at increased risk for influenza were more likely to accept the vaccine than those who were not (Clark et al., 2009). This is related to the supposition that HCWs are unlikely to strongly identify themselves as a vehicle for influenza transmission to their patients (Hollmeyer et al., 2009).

Declining vaccination has a substantial financial impact on organizational and even community stakeholders. According to Keech and Beardsworth (2008), flu outbreaks often result in high rates of absenteeism due to the debilitating nature of the virus. This absenteeism, in turn, results in an increased financial burden (due to replacement costs, etc.), which then leads to a financial burden on society in general. These costs, however, can be mitigated. For example, Anikeeva et al. (2009) noted that successful vaccination campaigns have the ability to provide a return on investment as high as $2.58 per $1 spent.

Health care organizations experience HCW absenteeism when there are influenza outbreaks. The mean number of working days lost because of influenza flu is between 1.5 and 4.9 days per episode (Keech & Beardsworth, 2008; Real et al., 2013). The cost of replacing these workers can be high. In fact, according to Lu et al. (2013), costs associated with vaccine education and vaccination administration programs are lower than the costs associated with controlling an outbreak should one occur. Furthermore, HAIs such as influenza virus result in negative patient outcomes such as exacerbation of heart disease, asthma, pneumonia, and other chronic conditions. These exacerbations could lead to a 2 to 4 day increase in length of stay (Keech & Beardsworth, 2008).

Influenza Education

Because misconceptions regarding the safety, efficacy, and benefits of influenza vaccination are so common, educational interventions are a logical strategy to improve vaccination rates (Hollmeyer et al., 2009; Person et al., 2013). In a RCT with an educational intervention, Abramson et al. (2010) reported a 52.8% (86 of 163) vaccination rate in the intervention group compared with 26.5% (48 of 181) in the control group ($p<.001$). In a comparison of the immunization uptake rate to the previous season, there was an increase of 25.8% in the intervention and 6.6% in the control group. In a similar RCT, Akker et al. (2011) used a theory-and evidence-based intervention education approach to alter vaccination declination decisions, and behaviors revealed comparable results. The authors reported higher influenza vaccination uptake, 25% in the intervention group as compared to 16% in the control group, thereby supporting the importance of the education program. Coupling the vaccine education program with a

convenient administration program would likely maximize this improvement in vaccine uptake (Hollmeyer et al., 2009).

Other incentive programs (such as raffle tickets and an educational reminder letter) are less effective at increasing vaccine acceptance. For example, researchers in Ohio found similar vaccine acceptance rates in a control group receiving an educational letter and an experimental group receiving the letter and a raffle prize ticket. In fact, vaccine rates remained comparable (41%) to contemporaneous national estimates (40%; Doratotaj, Macknin, & Worley, 2008).

Vaccination Ethics

The consequence of low voluntary vaccination often leads health care organizations to implement mandatory vaccination programs (Zhang et al., 2012). Despite the clear success in vaccination in mandatory programs, ethical considerations are contested and debated among national professional organizations such as the American Nursing Association and the American Hospital Association. These considerations include the person's right to autonomy, regardless of the effect on health and the surrounding environment (Zhang et al., 2012). Major reasons cited in opposition to mandatory campaigns have included fear of disciplinary action and the volume of existing health-related requirements. The debate has resulted in mandatory vaccine campaigns being reversed and/or revised due to the work of powerful nursing organizations such as the Washington State Nurses Association (Willis & Wortley, 2007). In a survey of RNs (n=506) seeking to learn the preferred methods of influenza prevention, 283 (56%) RNs preferred mandatory influenza vaccination and 394 (59.4%) RNs supported an annual influenza policy with an informed declination.

In some cases, mandatory vaccination programs have been remarkably effective, albeit controversial. For example, Loyola University boasted a > 99% vaccination rate (among their more than 8,000 employees for 4 consecutive years) with < 1% largely exempted for contraindications. Organizational leaders reported that some providers chose to leave the organization in response to the requirement; however, they reported only a negligible number (Lillis, 2013).

In order to avoid ethical issues associated with mandatory vaccination programs, Mouzoon, Munoz, Greisinger, and Brehm (2010) cited improved employee influenza vaccination coverage rates that increased from 36.0% in 2003-2004 to 64.0% in 2008-2009 with a mandatory education approach for all HCWs. However, this approach leaves a large number of HCWs (36%) without vaccination. In their model, prior to each influenza season all health care workers were required to complete mandatory education using criteria established by ACIP and CDC regarding influenza prior to each influenza season. This further supporting the CDC and ACIP recommendations of the best strategies to improve influenza vaccination rates among HCWs is through annual structured annual promotional campaigns and educational programs (CDC, 2013b; CDC, 2014a).

Health care organizations have focused on mandatory educational programs for HCWs in lieu of mandating vaccination. These programs increase program compliance as well as vaccination rates (Cornally, Deasy, McCathy, Moran & Weathers, 2013). For example, the authors surveyed RNs to learn they prefer to participate in an educational session rather than imposing mandatory vaccination protocols. Descriptive data indicate there are general educational deficits related to influenza risk, vaccine safety, and vaccine

efficacy (Hollmeyer et al., 2009; Willis & Worley, 2007) while few authors advocate for mandatory vaccine programs. Stewart & Cox (2011) report that only approximately 300 facilities and three health departments have such requirements.

Conceptual Framework: Health Belief Model

The HBM proposes individual beliefs about health problems, perceived benefits of action and barriers to action and self-efficacy explain engagement or lack of engagement in health promoting behavior (Kuhns & McEwen, 2011). HBM is the model chosen to guide this project because the precipitators of and barriers to influenza vaccination include problem specific attributes, such as susceptibility, severity, benefits, and barriers (Boston School of Public Health, n.d.; Efstathiou, et al., 2011).

Using the HBM to detect influencing factors for RN compliance with influenza vaccination, Efstathiou et al., (2011) focused on the factors that impact overall compliance. The HBM has also been successfully employed in predicting lay person intent to receive the H1N1 vaccine while it was still an emerging pathogen. In this case, individuals who perceived themselves to be at risk, received cues to action (such as recommendations or referrals from HCWs) and perceived fewer barriers (such as side-effects, access issues and sickness) were more likely to report an intent to vaccinate against H1N1 (Coe, Gatewood, Moczyemba, Goode, & Beckner, 2012).

The RNs misconceptions regarding their own risk of flu, the severity of flu and the risk transmitting flu to others, coupled with a lack of knowledge regarding flu vaccine safety and efficacy are barriers to change of behavior. The HBM addresses the majority of these areas and was therefore selected as the guiding framework for this project. The project intervention was a professional educational module that included the risk

perceptions of both patients and caregivers, the knowledge of influenza transmission, the negative consequences of declination, and the efficacy of vaccination. For example, the module includes susceptibility (a component of the HBM) data such as the fact that more that influenza is the sixth leading cause of death among American adults and is responsible for more than 200,000 hospitalizations and 36,000 deaths annually (Ottenberg, et al., 2011). Further, the module addresses misconceptions regarding vaccine benefits (another component of the HBM) by informing participants that vaccine reactions are rare, and often mild when they do occur and that the vaccine is frequently effective (Llupia et al. (2013).

Summary of Section 2

This section reviewed the scholarly evidence that support this project proposal. The literature reviewed overwhelming identified knowledge deficits and misconceptions as the primary barriers to vaccination among HCWs. More specifically, individual knowledge about individual and transmission risk, and vaccine safety and efficacy were reported. Educational programs addressing these barriers were recommended. Programs which used a theoretical framework (the HBM) were successful at improving vaccine uptake in RNs.

Section 3: Approach

Introduction

The purpose of this project was to evaluate how a web-based educational program impacted the RN influenza vaccination rate at IHNV. This section outlines the project methodology, including program implementation, setting, targeted population, and data collection method. Additionally, this section describes the instruments used for data collection and analysis. Finally, approvals from the IHNV and Walden University Institutional Review Boards are provided.

Setting

Inspira Health Network (IHN) is a nonprofit health network consisting of four hospital campuses (Vineland, Elmer, Bridgeton, and Woodbury) in rural southern New Jersey. The Vineland campus (IHNV) was the primary project site and the site where the educational intervention was delivered. A nearby campus, IHN Elmer (IHNE), served as a comparison group to evaluate the program's effectiveness. Education was not offered at this site; however, nurses were anonymously surveyed about their vaccination status. A Magnet designated organization, the network's mission is to ensure the highest quality and safest delivery of care. In November 2009, IHNV changed external accreditation providers from the Joint Commission to Det Norske Veritas (DNV) based on the DNV's adoption of National Integrated Accreditation for Health Care Organizations (NIAHO) standards, which closely align with CMS requirements. Additionally, the network is committed to creating a healthy work environment through the establishment of prevention and wellness programs. This organization participates in internal and external prevention and wellness activities. The chief nursing officer leads new initiatives that

focus on the health and wellness of the employees at IHNV. Examples of initiatives include:

- Free influenza vaccinations
- American Heart Association Fit Friendly Walks
- Community involvement and sponsorship in variety of fundraising walks/runs
- Reduction in annual fees for organization's gym, The Fitness Connection
- Heart Healthy meals in the eatery
- Hand Hygiene Campaign (E. Sheridan, personal communication, August 20, 2014)

Project Design and Methods

The project used a quantitative research method with a quasi-experimental nonequivalent control group. Because both the comparison group and the intervention group were convenience (non-randomized) samples, a quasi-experimental design was necessary. The participants self-selected; hence, I was unable to control the assignment of the individuals to groups. The groups were pre-existing and nonequivalent (Burns & Grove, 2009). The selection of this design was most appropriate for this study because it offered a larger cross section of nurses. This design also limited the potential for interaction between the two groups of participants and limited any potential bias; I had no influence over either study site. A brief anonymous paper survey method limited the participant's time commitment required for completion but allowed for collection of sufficient data to gain insight into similarities, differences, and trends to make predictions about the sample population. The anonymous survey also allowed for data collection

from a large population without cumbersome effort on my part. According to Burns and Grove (2009), the survey method also offers an efficient, low-cost means to obtain and analyze data. Lastly, the selection of this method will allow IHNV to continue with the same methodology with other groups of participants in future studies.

The project tested the effectiveness of the selected intervention, a web-based influenza virus and vaccination professional educational module. Participation in the intervention, a 15-minute education learning program, was voluntary. The program content was developed to address knowledge gaps identified in the literature search and was formatted in accordance with the principles of the HBM (see Appendix B for the text of the education program).

The program was made available to all RNs through an existing internal web-based computerized program, HealthStream®. This approach was a familiar learning method for the participants and a standard education delivery method in the project setting. The educational program was made available during the employee influenza vaccination campaign. Nurses in the intervention group (IHNV) had access to the educational program and were notified about the program through a flyer (Appendix C), which was distributed in both printed and digital format. Nurses at IHNV were also invited to participate in the program through an email announcement (Appendix D). Finally, the nursing leaders at the IHNV site were encouraged to include the availability of the educational program in their routine staff meeting agendas. Nurses in the comparison group (IHNE), who did not receive the educational program, were made aware of the study when they presented for vaccination or declination.

A four-question survey was used to collect data from two nonequivalent groups: (a) RNs at IHNV who received the intervention (web-based education) and (b) RNs working at IHNE, who did not (See Appendix E to review the cover letter and study survey). The use of a comparison group located in another hospital limited the risk of bias related to information sharing between nurses who participated in the education and their colleagues who may not have participated. As each RN presented to the IHNV or IHNE influenza vaccine clinic or occupational health office, he or she was provided the standard vaccine consent (Appendix F) or declination form (Appendix G).

After vaccine administration or completion of the declination form, participants were asked to complete the study tool. The tool allowed participants to self-select whether or not they participated in the intervention and to indicate whether they opted to receive or decline the seasonal influenza vaccine. Other pertinent influenza and demographic information was also collected; however, anonymity was maintained. Surveys for data collection were returned immediately following completion to the secured lock box located at the site of vaccine administration. The project leader was the only person able to access the secured box. Pursuant to IRB requirements, participants received a copy of the consent form. Because consent for the anonymous survey was included in the study survey instrument, participants received a copy of the instrument water-marked "Participant Copy—Not for Analysis" (Appendix H).

A Gantt chart was a useful resource to visualize the project schedule. The chart defined the key activities, from start to finish, determined critical for project implementation. The Gantt chart allowed me as the project leader to track the project activities to ensure timeliness. The Influenza Vaccination Education Project Weekly

Gantt Chart (see Figure 3) provided the key activities and project deadlines for each week.

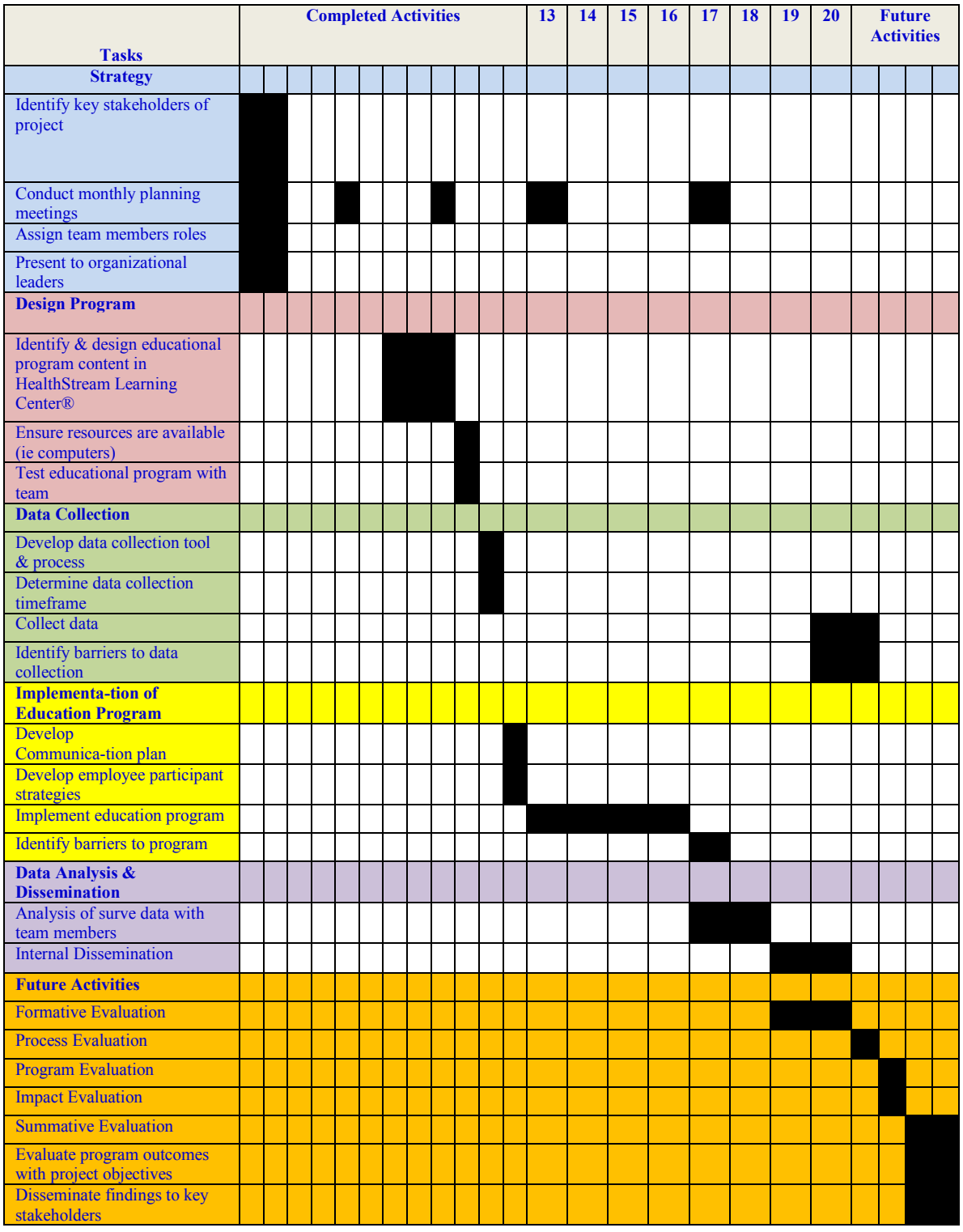

Figure 3. Influenza vaccination educational learning project weekly Gantt chart.

Sample Population

The project targeted a convenience sample population of RNs, as previously defined, who were employed in two acute care hospital settings (IHNV and IHNE). The sample population included nurses at all levels ranging from executive to leadership to clinical (bedside) roles as described in the needs assessment section of this document. I was available to meet with nursing leaders to address questions and to encourage participation in the project.

Inclusion criteria:

- All RNs employed at the IHNV and IHNE campuses, regardless of FTE status.
- Participate in Influenza vaccination campaign and complete study tool.

Exclusion criteria:

- RNs who are ineligible to receive vaccination.
- RNs temporarily assigned to IHNV.
- RNs who are non-IHNV employees.
- RNs who were previously vaccinated at a site other than IHNV.

An *a priori* power analysis indicated that a minimum sample size of 80 participants was required for the analysis of participant behavior with and without exposure to the educational intervention. This sample size was essential to conduct strong nonparametric statistical testing using chi-square (x^2) goodness-of-fit test (Faul, 2014). A sample of 80 participants was necessary for a x^2 analysis with a power = 0.95 and a large effect size *(*w=0.5). A sample of 220 or greater allowed for analysis in aggregate with a

power = 0.95 and a moderate effect size (w=0.3). According to Polit (2010), the test determines significance between the proportions of two dichotomous variables.

The total population eligible for participation was 701 at IHNV and 367 at Elmer. According to Baruch and Holtom (2008), the mean return rate for surveys given in person and returned to a drop box is 62.4%. Mean return rates for surveys of any kind in the healthcare industry are similar at 53.8% (Baruch & Holtom, 2008). Based on this information, it was anticipated that at least 50% of potential participants would complete and return their surveys. Because the study only remained open for a portion of the Inspira influenza vaccination seasonal campaign full accrual was not achieved. However, the minimum of 80 participants was reached.

Variables

The independent variable was the influenza vaccination educational program. The dependent variable consisted of the influenza vaccination rates reported via the study survey. Pearson's chi-square goodness-of-fit test tested statistical significance using two dichotomous variables: exposure to intervention (yes or no) and vaccination (yes or no).

Extraneous variables are categorized as recognized or unrecognized and controlled or uncontrolled variables in a study. These place limitations or weaknesses on the study. The use of a quasi-experimental study limits the control and increases the potential influence of confounding variables (Polit, 2010). Extraneous variables in this study included availability of vaccine clinics, ability to access the education, severity of the previous flu season, and media coverage of influenza vaccine effectiveness.

There were several confounding variables identified in this study. They included the potential selection bias using a convenience sample population. RNs who

participated in the flu vaccine education may have been more likely to be interested in preventing flu and therefore more likely to be vaccinated with or without the intervention. Another confounding variable identified was participant anonymity, which was chosen in order to increase participation. Due to participant anonymity, specific comparisons cannot be made involving participant behavior in previous years; this was recognized as a limitation (Burns & Grove, 2009).

Data Collection

Instrument

This study used an instrument created specifically for the purpose of this project. The instrument (Appendix F) was used to collect anonymous self-reported information regarding exposure to the intervention, acceptance or declination of the vaccine, previous year's vaccine status, and history of flu. Demographic information was collected in order to describe the study population. No personally identifying information was collected via the survey instrument, and participants remained anonymous. Occupational health employees managed the IHNV and IHNE consent or declination forms per their usual practice. Completed study instruments were only accessible to me upon retrieval from the locked drop box located at the vaccine clinic and/or occupational health office. Once converted to an electronic database, information was accessible only by me on a password protected computer subject to IHNV and IHNE cybersecurity protections.

Protection of Human Subjects

I am credentialed to conduct human subjects' research by the IHNV Institutional Review Board and underwent National Institute of Health Human Subjects Protection training. This study protocol was reviewed and approved by both the IHNV IRB (IRB

Approval #N2015-015; see Appendix A) exempt committee and the Walden University IRB (IRB Approval #01-20-15-0122701; see Appendix A).

Deidentified surveys were analyzed in aggregate. All paper files were destroyed at the conclusion of the project. Electronic data will be maintained through professional dissemination (peer-reviewed publication) or for 5 years at minimum.

Data Analysis

Reliability

Reliability, according to Polit (2010), represents the ability of an instrument to consistently measure the phenomenon or construct of interest. In this study, a specially created survey was used to measure the desired outcome (influenza vaccine decision). Over- and underreporting on surveys is more likely to be seen when questions are considered socially sensitive—for example, church attendance or criminal records (Preisendorfer & Wolter, 2014). No such items were included in this survey. According to Morrel-Samuels (2002), well-designed surveys are more likely to elicit accurate information. For example, survey items should address observable or reproducible behaviors, not opinions or inferences, and questions should address only one topic or idea each. Surveys should also be anonymous (Morrel-Samuels, 2002). These guidelines were used in the creation of this survey; the brief survey tool represented a feasible and cost-effective means to gather data on the large sample population.

Validity

Validity is defined, according to Polit (2010), as the ability of a measurement instrument to actually measure the phenomenon it is intended to measure. To ensure content validity, scholarly literature was used in the development of both the educational

intervention and the data collection instrument. Experts in infection control and prevention and employee (occupational) health were also consulted in the development of both the education and the instrument (Burns & Grove, 2009).

Analytical Techniques

Descriptive statistics (frequencies) were used to describe the sample population, including role, education level, tenure, and practice setting. A chi-square (goodness-of-fit) analysis was used to assess for any significant difference in vaccination between the two groups in the study (Polit, 2010). This analysis included those comparisons made between vaccine acceptance rates at the two study sites (IHNV and IHNE) and between participants who received the intervention education and those who did not (regardless of site). Additional analysis was performed to assess for differences between different subgroups within the study population such as rates of participation in the intervention between nurse leaders and clinical nurses or between nurses who contracted influenza in the previous year and those who did not. The chi-square analysis was conducted using the software program Statistical Package for the Social Sciences (SPSS) version 23 (SPSS Inc., Chicago, Illinois) to test the statistical significance of the relationship between the two variables.

Project Evaluation Plan

According to Friis and Sellers (2009), evaluation is the final determinant of whether a project has been successful or not. Successfully engaging key stakeholders and meeting critical program milestones was crucial to achieving the desired outcome of this program (improving influenza vaccination rates at IHNV). In the evaluation method, it was necessary to monitor and evaluate milestone achievements along the timeline of the

program and assess the performance outcome metrics. This monitoring tested the feedback loop system as demonstrated in the logic model (see Figure 1).

Feedback evaluation involved formative, process, program, and impact evaluation, and summative evaluation processes included input from key stakeholders (Hodges & Videto, 2011). The comprehensive evaluation plan is displayed in Table 2.

Table 2

Evaluation Plan of Program

Evaluation question	Information needed	From whom	How collected	When collected	Types of data	Analysis
Did participants in the educational program (using the tenets of the health belief model) have higher rates of vaccine uptake than those who were not educated?	Survey reported influenza vaccination rates	Internal database	Analysis of brief survey form	Collected throughout the influenza campaign Analyzed at the conclusion of the campaign *Possible additional evaluation: if repeated in subsequent flu seasons (ex. 2016-2017) compare vaccine rates from to prior season (2015–2016).*	Dichotomous Nominal (vaccine status—yes or no)	Chi-square to compare differences in vaccine rates between the two groups: those who participated and those who did not
Did the program aid in improving influenza rate to the goal of 90% in the targeted RN population	Employee Health documented influenza vaccination rates	External database NHSN	Use of anonymous brief survey attached to influenza consent and declination forms	Collected through the influenza campaign Analyzed at the conclusion of the vaccine campaign	Ratio—Vaccination percentage (# vaccinated / # eligible)	Comparison of current vaccination rates to vaccination rates of previous year
Did the program incorporate appropriate content and activities?	End user/ participant feedback	RN population (those who did and did not participate in education)	Focus group evaluation	Immediately post completion of vaccine campaign *Possible additional evaluation: prior to start of next influenza campaign)*	Nominal / qualitative data	Analysis of themes—suggestions of opportunities for improvement RT program accessibility, content, and relevance.

Formative evaluation provided feedback and information during the educational training process and included assessment of participation in the voluntary education program at the IHNV site. Formative evaluation occurred at routine (weekly) intervals during the time period in which the educational program was available. Process evaluation explored the effectiveness of the program, explored means for sustainability, and reviewed the theories or models applied to the program. This occurred during the implementation of the education and continued through the vaccine campaign. There were many areas of the process evaluation to explore to ensure the following: fidelity, materials, delivery of the program, recruitment of the targeted population, efficiency, and cost effectiveness. Next, impact evaluation occurred to assess the level to which the program had produced a change in the targeted population. This was completed through the statistical analysis of vaccination rates previously described. If needed, changes to the project's future goals and objectives would have also been considered at this time (Hodges & Videto, 2011).

Last phase of evaluation was the summative. Summative assessment takes place after the learning has been completed and provides information and feedback that sums up the teaching and learning process. This phase, while outside of the IRB approved research project and outside the scope of this project's timeline, focuses on the long term effects of the program. Typically, no more formal learning is taking place at this stage, other than incidental learning which might take place through the completion of projects and assignments (Polit and Beck, 2004). In this case, the summative evaluation will, in the future, focus on overall RN vaccination rates at each campus (irrespective of survey completion). Once complete, this evaluation will provide an evaluation of learning

methods in the project (Hodges & Videto, 2011). Additionally, focus groups could be completed with participants to assess the usability, content and general satisfaction with the education program.

This project was developed considering clinical as well as statistical significance. The evaluation of statistical significance was completed as described above using chi-square analysis. Clinical significance could, in the future, be evaluated by exploring secondary impacts of the program such as decreases in absenteeism and decrease for potential flu transmission to patient. For example, the decrease in potential exposure can be quantified by determining how many patients each nurse contacts during a given shift, then multiplying this number by the number of nurses vaccinated over the previous years and by the number of days each nurse works in the current flu season. Additionally, absenteeism could be evaluated by evaluating the number of call-outs in general, and the number of call outs made by unvaccinated RNs versus vaccinated RNs, any decrease would result in lower replacement costs. Unfortunately a number of extraneous and confounding variables including the effectiveness of the vaccine and the severity of the flu season could impact these clinical outcomes. Lastly, the use of post-hoc focus groups is suggested to evaluate the education program itself to in length of time, content, and format.

Summary of Section 3

Section three provided the approach of the proposed project, which included the project design, methods, data collection and analysis. The implementation, evaluation and results of this project provided valuable information for both IHNV and IHNE. This will allow for future dissemination of the program to other disciplines within the organization.

Section 4: Summary of Project Outcomes, Findings, and Implications

Summary of Project Outcomes

A total of 192 surveys were returned during the data collection period of approximately 3 weeks. During this time, both sites conducted "amnesty" days on which noncompliant employees were allowed to attend the flu vaccine clinic and either receive the vaccination or complete a declination form. A total of 116 surveys (60.4%) were returned at the IHNV campus, and 76 were returned at the Elmer campus (39.6%). The education program, implemented at IHNV only, received a total of 145 views. Of those returning surveys at the IHNV campus, 79 (41.1%) reported having viewed the education. Clinical (bedside) RNs constituted the largest group of respondents (n=132, 68.8%). The majority of respondents worked in a medical–surgical specialty (35.5%) and prepared at the BSN level (67.2%). A full breakdown of the demographic characteristics can be seen in Table 3. Most RNs who accepted the vaccine, regardless of their primary work site, had been vaccinated the previous year as well (79.7%). Interestingly, only 5.7% of respondents reported having previously contracted the flu within the last 2 years.

Table 3

Demographic Breakdown of Respondents

	Vineland	Elmer
Total ***N***	116	76
Completed education	79	0
Accepted vaccination	94	64
Previous influenza (2 years)	8	3
Previous vaccine (last year)	98	55
Nursing role		
Clinical RN	84	48
Nonclinical nurse	13	9
Nurse executive	6	2
Nurse leader	13	17
Nursing degree		
Associate's degree	25	7
BSN	67	62
MSN	24	7
Most common practice settings		
Critical care	16	13
Emergency department	14	9
Maternal child health	7	4
Medical–surgical	39	29
Surgical services	14	11

Vaccine acceptance rates, overall, were similar between the two campuses. In fact, acceptance rates at IHNV (where the education was made available) were slightly lower (81.1%) than acceptance rates at IHN (84.2%; x^2=0.318, p=0.573). However, vaccine acceptance rates among participants who reported completing the educational program were significantly higher (91.1%) than among those who reported not having viewed the education program (76.1%; x^2=7.210, p=0.007). A significant difference in the vaccine acceptance rate was not seen in relation to any of the other demographic variables (nursing specialty, nursing role, academic degree). When comparing the prior year's decision to vaccinate or not, a significant difference was seen in the percentage of RNs who chose vaccination this year. Specifically, 87% of RNs who received the vaccine the previous year were revaccinated this year, while only 12.4% of those who were previously vaccinated refused vaccination this year (x^2=14.465, p<0.01). Only 11 RNs reported having had influenza in the previous 2 years; of those, 10 were vaccinated this year, and one was not. A full list of vaccine decisions presented according to several demographic and study variables can be seen in Table 4.

Table 4

Vaccine Decision by Demographic Variable

Campus	Vaccine: yes	Vaccine: no	Significance
Vineland campus	94	22	
Elmer campus	64	12	
Previous influenza (2 Years)	10	1	$x^2 = 0.595$, $p = 0.441$
Previous vaccine (last year)	148	33	$x^2 = 14.465$, $p =< 0.001$
Nursing role			$x^2 = 5.347$, $p = 0.148$
Clinical nurse	104	28	
Nonclinical nurse	4	18	
Nurse executive	0	8	
Nurse leader	2	28	
Nursing degree			$x^2 = 1.655$, $p = 0.437$
Associate's degree	24	8	
BSN	109	22	
MSN	25	6	
Most common practice settings			$x^2 = 8.981$, $p = 0.344$
Critical care	23	6	
Emergency department	18	5	
Maternal child health	9	2	
Medical–surgical	62	6	
Surgical services	18	7	

Discussion of Findings in the Context of Literature and Framework

Current literature suggests that the most common reason for influenza vaccine refusal involves misconceptions regarding the safety and efficacy of the influenza vaccine. As such, the program was designed to address these misconceptions by providing factual information about influenza severity, vaccination safety, and historical efficacy. This information appears to have addressed the reasons previously unvaccinated RNs chose vaccination. In total, 39 RNs reported not having received the vaccine last year; of those, 11 completed the education and all but one chose to receive the vaccination this year. In addition, all of the individuals who previously had the flu and who participated in education accepted the vaccination this year.

This project was created using the tenets of evidence-based practice and the HBM as the guiding framework. The framework provided the structure for the educational program to provide participants with targeted information in order to fortify a positive evidence-based perspective, or perceived seriousness, perceived susceptibility, and perceived benefits favorable to vaccination.

The findings demonstrate that the educational program effectively addressed the most common barriers to vaccination in that individuals who participated in the educational program were vaccinated at a significantly higher rate than those who did not. Interestingly, the vaccination rates at the IHNE campus (comparison site) were slightly higher than the IHNV campus (intervention site). The findings suggest that the educational program influenced the individual's vaccination choice; however, the impact on vaccine decision did not spread from these educated individuals to the overall hospital population One possible explanation is that individuals thoughtfully considered the

program's effectiveness and benefit to patients yet did not share or discuss their choice with others.

Implications for Practice and Social Change

This project promoted improved health and wellness in RNs and heightened the commitment to community through limiting the spread of the influenza virus with vaccination. The results of this project demonstrate that a voluntary education program can shift the influenza vaccine decisions of registered RNs. Although a pilot project has limitations specific to generalizability, the project demonstrated that mandatory vaccination programs are not necessary to achieve effectiveness in vaccination rates through changing nursing behaviors.

The implications of improving vaccination rates of RNs have been well established in this paper. Developing programs that have the ability to effect societal change is the realm of advanced practice and doctorally prepared RNs. The advance practice nurse (APN) has the expertise to develop and communicate important health messages that address an individual's perception of susceptibility to influenza, the severity of the virus, and potential complications. APNs and clinical RNs are well positioned to influence health promotion practices through educational programs, such as those concerning influenza vaccination.

For this project, the educational program was targeted and time specific, or offered as a supplemental learning activity to a defined population at a specific time. In the future, this program could be converted into an educational requirement for RNs, or perhaps all clinical staff. This change in practice has the potential to not only change the vaccine behaviors of HCWs, but also change vaccine-related information provided to

patients. As stated by Mund (2011), RNs have the ability to improve the nation's health through political activities such as advocating for evidence-based health policy legislation. For example, the educational program provides information about common misconceptions related to vaccine safety and efficacy. Armed with this information, RNs could share this information with their patients and perhaps even their families. With additional communication strategies, the new knowledge could change the vaccine decisions of these patients and/or family members.

As an agent of social change and future DNP graduate, I found that this project allowed me to experience the interface between best practice, research, and policy in the practice setting (AACN, 2006). This project demonstrated the ability of a DNP graduate to change vaccine practices in an acute care organization. For example, RNs, by virtue of their professions, are patient advocates and seek to improve health and wellness. By sharing what they learn in the education program with increased advocacy and communication, RNs can substantially impact the wellness of their colleagues and community members, who might also choose to not decline or refuse influenza vaccination.

This program is not complicated and can be translated into a variety of health care and non-healthcare settings (e.g., schools or corporate offices). When offered in these settings, a similar improvement in the vaccine acceptance rate is reasonable to expect. Aggregately, this simple low-cost/low-effort program can precipitate substantial change in RN vaccination and public health outcomes specific to influenza.

Project Strengths and Limitations

The project was uncomplicated but sufficiently rigorous to implement and assess. The web-based educational program was delivered via an existing educational platform familiar to all of the RNs. The project survey was brief but complete in collecting that it collected all the important demographic and vaccine decision information. The anonymous survey encouraged voluntary participation by limiting fear of reprisal for vaccine decisions. The use of a second site as a comparison group helped to strengthen the project and limited the risk of subject contamination. If data had been collected only from subjects at the IHNV campus (where the education was offered), the possibility would have existed that even those individuals who did not view the education might have discussed it with colleagues or peers.

The project had several limitations. Convenience sampling provides minimal opportunity to control for biases, particularly those related to self-selection to participate in the education and self-selection to participate in the anonymous survey. Additionally, variations in educational level, nursing role, and practice specialty were not controlled. For example, at the IHNV campus, clinical RNs outnumbered RN leaders and executives by a larger proportion (84 versus 19, or approximately 20:1) compared to the IHNE campus (48 versus 19 or approximately 2.5:1). However, at both sites, a specialty of medical–surgical nursing was most commonly reported; this was likely because it is the most populous specialty in both organizations (see Table 3 for additional demographic descriptions). Although this limitation can be avoided through the use of randomization, this project would be more complicated and difficult to implement as a result. Finally, the potential for delay in time between the time that participants complete a learning

program and when they present for influenza vaccination (or declination) may influence their recall of the knowledge gained from the education program. Other limitations of this study were related to the limited timeline for implementation and external variables not measured. For example, overall vaccine uptake measurement at both sites and measurements of absenteeism throughout the entire influenza season were not included in this project due to time constraints. However, these measurements might be possible in another retrospective analysis.

One final key limitation of this project was its seasonal nature. Due to unforeseen time constraints, this project was implemented after the initial influenza vaccine campaign had begun at both IHNV and IHNE. Due to the delayed project implementation, data were collected from RNs who attended one of several "amnesty day" (make-up) vaccine clinic sessions in which non-compliant staff members at both sites were permitted to present for vaccination or completion of a declination form. This small subset of individuals who presented for vaccination or completion of the vaccine declination form was not representative of the general population. This situation might make the significance of the intervention more difficult to establish, as this group might be more representative of RNs who were less likely to accept the vaccination.

Analysis of Self

Scholar

Subsequent to this project, I am now able to recognize the ability of a scholarly project to improve patient care and change organizational practice. Further, I now fully appreciate the role of a doctorally prepared RN's scholarly work in precipitating societal and public health change. During the completion of this project, I have benefitted from

the mentorship of academic leaders such as university faculty and advisors. Subsequently, I now have begun to develop a professional identity that includes the role of scholar. As such, I now feel a sense of obligation to provide support and mentorship for scholarly projects conducted by colleagues in the future.

Practitioner

The completion of this project, while largely academic in nature, allowed me to recognize the vital role that doctorally prepared RNs play in both generating evidence and translating evidence into practice. As an expert practitioner, I now have the role of continually reviewing relevant evidence on practice issues of interest, developing strategies to translate this knowledge into practice, and monitoring outcomes that result from practice changes. The results of this project, as previously described, clearly demonstrate the impact scholarly practice changes can have. While the practice change in this case resulted in a change in nursing behaviors, I look forward to projects in which the use of evidence alters clinical practice and subsequently improves patient outcomes.

Project Developer

The development of this project was among the aspects of the experience that generated the greatest insight. For example, I had the opportunity to develop a project instrument (the survey tool) and request feedback from a variety of sources. I also created the project intervention (the educational program). While this was done outside of the university and academic setting, it was an opportunity to operationalize a theoretical framework (in this case, the HBM). Further, I had the opportunity to collaborate with numerous organizational and academic (university) departments and resources, including Walden University IRB, Inspira IRB, Occupational Health, Infection Control and

Nursing Education. While some struggles (largely related to timeline) did exist, this experience was invaluable in demonstrating the leadership and collaboration skills necessary to design, implement, and test the effectiveness of a large-scale project.

Professional

As a result of this project and the completion of the DNP program, I have developing an evolved sense of professional identity that includes elements of each of the previously discussed areas. This project and program have allowed me to be able to gain additional practitioner experience that relates to both leadership and clinical nursing practice and have provided exposure to new areas of the nursing profession such as academia and nursing research. Additional experience in the area of public health and exposure to the societal implications of practice change has also contributed greatly to the professional development of me. The result of this project is an evolved and multifaceted professional identity.

Summary of Section 4

Providing high-quality and safe patient care is the primary aim of today's healthcare leaders. RNs are critical in the delivery of defect-free health services. Recent industry trends link RN wellness to improved organizational outcomes. Influenza prevention through vaccination is one aspect of this approach; in fact, vaccination against influenza is recommended for all HCWs by most national and international health services and quality improvement bodies.

This evidence-based project sought to address a population health problem at IHNV in which rates of influenza vaccination were substantially lower than national goals. The project proposed an evidenced based education intervention tailored to address

common barriers to influenza vaccine uptake with follow up analysis of vaccination data. The educational program was developed using the tenets of the Health Belief Model, incorporated current evidence, and provided accessible and cost-effective in its web-based delivery.

A multi-faceted approach to evaluating project effectiveness included a comparison of vaccine rates between those who had the opportunity to participate in the educational intervention (the study site, IHNV) and those who did not (the comparison site, IHNE) using an anonymous, self-reported survey. The results of this project show that vaccine acceptance rates were significantly higher (x^2=7.210, p=0.007) among RNs who viewed the education when compared the to the vaccine rates of those who did not (91.1% versus 76.1%). This was true even though the overall vaccine acceptance rate was lower at the site where the education was offered. Another notable finding was the all but one of the RNs who had refused vaccination in 2014-2015 and who completed the education program chose to accept the vaccine this year. Based on these results, it can be concluded that the educational program was likely to have positively impacted the vaccine decision behaviors of RNs. Therefore, the vaccine education should be, at a minimum, continued in the organization. In fact, it is likely that, based on these findings, the program will be expanded to all HCW and changed from voluntary to mandatory. Additional future evaluations (outside of the scope of this project) could assess return on investment (related to reduced absenteeism and cost for sick care) and overall vaccine uptake improvement as compared to previous years. The project results, the results of these future assessments as well as feedback from key stakeholders will be used to help determine the long-term sustainability of the project.

Section 5: Scholarly Product for Dissemination

Forsyth, Wright, Scherb, and Gaspar (2010) identified the dissemination of findings as the final process to advance clinical practice. Furthermore, Forsyth et al. (2010) state that new knowledge must be synthesized, translated and exchanged in order for it to change health policy and result in evidence-based practice changes. A multi-faceted approach was selected for the dissemination of this project's findings to key stakeholders and the organization as a whole.

The use of poster presentation provides an effective way to deliver EBP projects. According to Forsyth et al. (2010), the use of poster presentations is beneficial because it allows for broad dissemination of current information in a variety of settings. The content of a poster for presentation is typically suitable for all healthcare audiences and therefore allows for internal and external dissemination. A poster has been created to disseminate this project's findings to the Inspira Health Network Research Council (primarily clinical RNs) and the Nursing Executive Council (primarily nursing leaders and managers) (Appendix I). An abstract for poster presentation has been submitted to the Organization of Nurse Leaders (ONL) of New Jersey (a division of the New Jersey Hospital Association [NJHA] and the national Voluntary Hospital Association [VHA]) and is currently under review for inclusion in the organization's annual regional research conference. Internal dissemination has been supplemented through Inspira's "Research Brief" process. Through this process, abstracts for all completed studies are distributed to the entire health network (Appendix J). Research Briefs are also reviewed at employee communication meetings, network shared governance councils, senior leader meetings, and IRB meetings as a standard agenda item.

An additional venue for dissemination of the EBP project would be through publication in a peer-reviewed professional journal. As stated by Zaccagnini and White (2011), peer-reviewed journals are appropriate for dissemination of findings to a group of professionals whose practice settings are similar. The selection of a journal that targets the audience of health care leaders and advanced practice RNs would be most appropriate for the content and theme of this quality improvement project. Due to the organizational impacts of this project, I selected journals that focus primarily on the practice of nursing leaders. The top three journals targeted for possible publication are *The Journal of Nursing Administration (JONA), The Journal of Nursing Management*, and *Nursing Economic$.* The publication of the project results would provide valuable information for future researcher's exploration of influenza vaccination declination in various health care settings. After final academic review, this manuscript will be evaluated for professional publication in accordance with Inspira Health Network's scholarly publication policy.

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Appendix A: Walden University Institutional Review Board Approval

Dear Ms. Spoltore, January 20, 2016

This email is to notify you that the Institutional Review Board (IRB) has approved your application for the study entitled, "An Organization's Approach to Improve Influenza Vaccination Rates among Registered Nurses in an Acute Care Setting."

Your approval # is 01-20-16-0122701. You will need to reference this number in your dissertation and in any future funding or publication submissions. Also attached to this e-mail is the IRB approved consent form. Please note, if this is already in an on-line format, you will need to update that consent document to include the IRB approval number and expiration date.

Your IRB approval expires on January 19, 2017. One month before this expiration date, you will be sent a Continuing Review Form, which must be submitted if you wish to collect data beyond the approval expiration date.

Your IRB approval is contingent upon your adherence to the exact procedures described in the final version of the IRB application document that has been submitted as of this date. This includes maintaining your current status with the university. Your IRB approval is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, your IRB approval is suspended. Absolutely NO participant recruitment or data collection may occur while a student is not actively enrolled.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB application, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website: http://academicguides.waldenu.edu/researchcenter/orec

Welcome from the IRB - Research Ethics & Compliance ...
academicguides.waldenu.edu
The Institutional Review Board (IRB) is responsible for ensuring that all Walden University research complies with the university's ethical standards as well as U.S ...

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,

Libby Munson

Research Ethics Support Specialist

Office of Research Ethics and Compliance

Email: irb@waldenu.edu

Fax: 626-605-0472

Phone: 612-312-1283

Office address for Walden University:

100 Washington Avenue South, Suite 900

Minneapolis, MN 55401

inspira HEALTH NETWORK
Institutional Review Board

November 17, 2015

Inspira Principal Investigator:
Terri Spoltore, MSN, RN, CCRN
Vice President of Patient Care Services
Chief Nursing Officer

Inspira Health Network
Inspira Medical Center Woodbury
509 N Broad Street
Woodbury, NJ 08096
SpoltoreT@ihn.org

INSPIRA IRB PROTOCOL #: N2015-015
RE: Notice Study Determined to be Exempt from IRB
Study: (N2015-015) An Organizational Approach to Improve Influenza Vaccination Rates among Registered Nurses in an Acute Care Setting
Version: August 27, 2015

Ms. Spoltore,

On November 16, 2015, the Inspira Health Network IRB ("Inspira IRB") Exempt Committee reviewed your new study application and determined the study is exempt from Inspira IRB in accordance with the federal code of regulations. Your proposal was evaluated in light of federal regulations that govern the protection of human subjects.

Specifically, 45 CFR 46.101(b)(2) identifies studies that are exempt from IRB review, including:

> **45 CFR 46.101 (b)(2):** *Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.*

Written informed consent is not applicable for exempt studies per federal regulations. The Inspira IRB Exempt Committee determined the informal consent language on the study survey appropriate. HIPAA Authorization is not applicable for this survey as no personal health information (PHI) is being collected for this study.

It is determined that your proposed project does not exceed minimal risks and meets Federal Regulations 45 CFR 46.101(b)(2). As specified in your New Study Application and Study Protocol, the study includes no identifying information and forethought has been made for the collection of anonymous survey data.

It has determined that your proposed study is exempt from IRB review and you may begin your research effective immediately. Written formal informed consent is not required in light of federal regulations. HIPAA authorization is not applicable as PHI is not being collected/recorded. All required regulatory information has been received by the Inspira IRB Office and meets the requirement for you to start your study.

Even though your project is exempt from IRB review, the research must be conducted according to the proposal submitted to the Inspira IRB Office. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a Request for Modification form to the Inspira IRB Office. Please be aware that changes made to the research protocol may prevent the research from qualifying for exempt review and require submission of a new IRB application or other materials sent to the Inspira IRB Office.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens

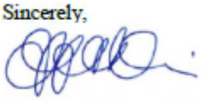
during your investigation, please notify the Inspira IRB Office as soon as possible. If notified, we will ask for a complete explanation of the event and your response. Other actions may also be required depending on the nature of the event.

As exempt from IRB, your study is not subject to annual review/continuation. The researcher should notify the Inspira IRB Office when the research study is closed/completed. Research studies should be closed when:

- The research study no longer meets the definition of "human subject/participant" (e.g., data are de-identified and the researcher does not have the ability to personally identify any data; or
- Data collection and analysis are complete; or
- The researcher is no longer an Inspira employee and an alternate Inspira researcher has not been designated as the Principal Investigator.

Please refer to the protocol number denoted above in all communication and correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact me.

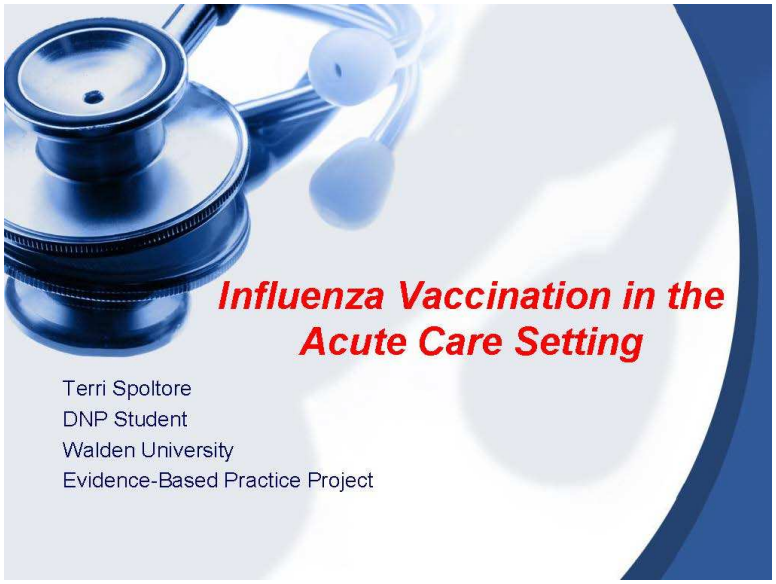
Sincerely,

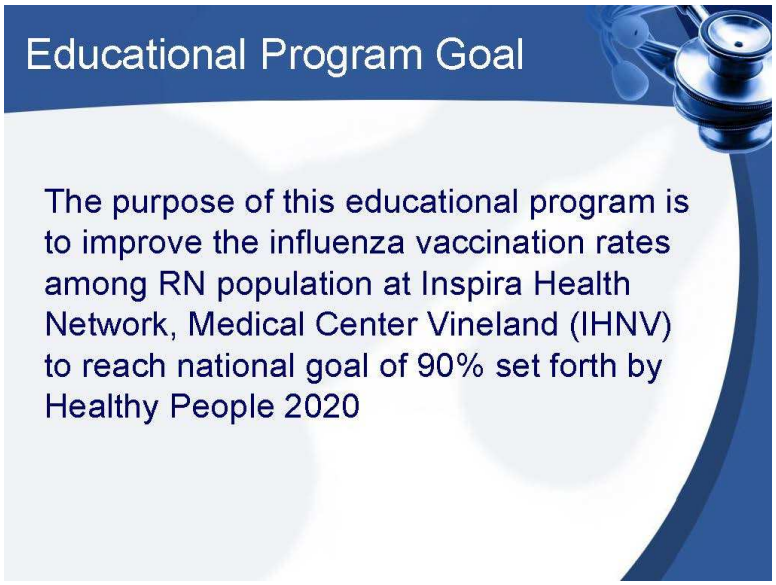


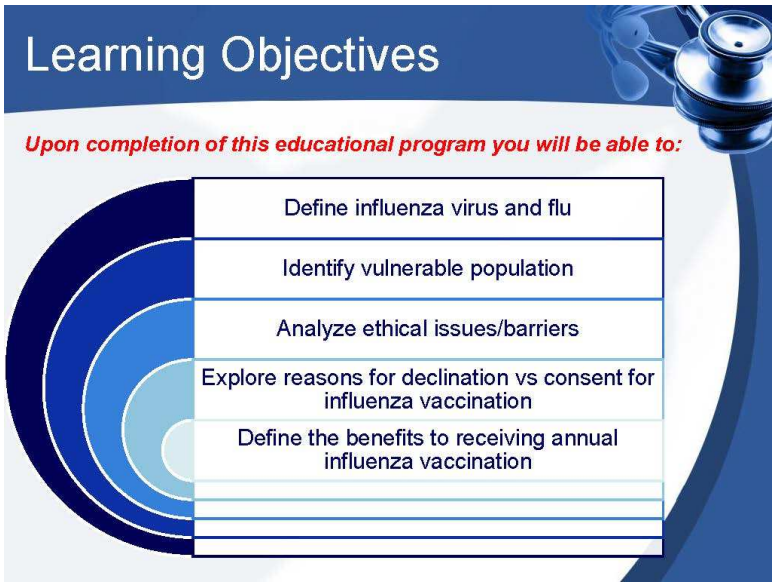
Jennifer A. Nanni, BA, CIM, CIP
Inspira Health Network Institutional Review Board
Inspira Medical Center Vineland
Research Box #113
1505 West Sherman Avenue
Vineland, NJ 08360
NanniJ@inh.org
(Bus.) 856.641.8688
(Fax.) 856.641.7705

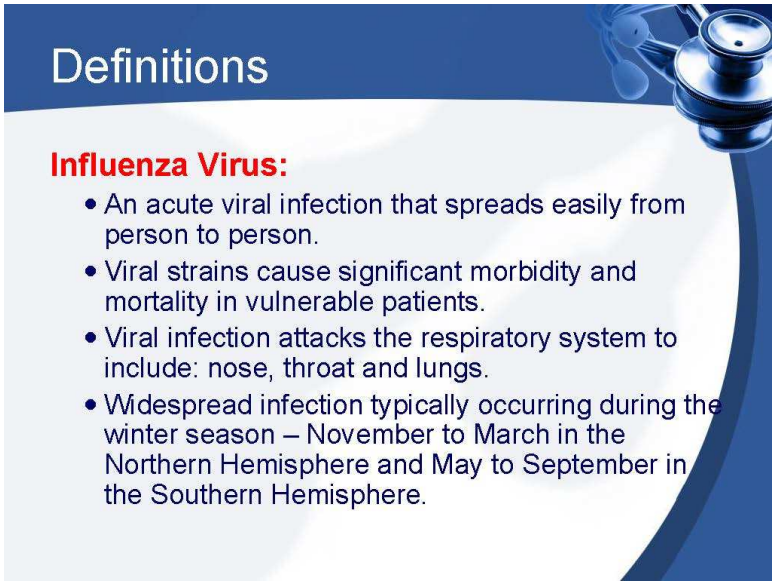
cc: Edward Gray, DO, Inspira Critical Care Director, Inspira Health Network IRB Chair
Sami Abate, MSHS, RN, CCRN – Director of Magnet, Nursing Quality & Research
Roseanne Racano, MSN, RN, CMSRN – Clinical Outcomes Manager; Research Council Chair
Michele Boyd, MSN, RN, NEA-BC – Director, Education and Practice

Appendix B: Education Program






Learning Objectives
Upon completion of this educational program you will be able to:
Define influenza virus and flu
Identify vulnerable population
Analyze ethical issues/barriers
Explore reasons for declination vs consent for influenza vaccination
Define the benefits to receiving annual influenza vaccination


Definitions
Influenza Virus:
An acute viral infection that spreads easily from person to person.
Viral strains cause significant morbidity and mortality in vulnerable patients.
Viral infection attacks the respiratory system to include: nose, throat and lungs.
Widespread infection typically occurring during the winter season – November to March in the Northern Hemisphere and May to September in the Southern Hemisphere.

Definitions

Influenza Vaccination:

- Come in the form of flu shot or nasal spray
- Seasonal influenza vaccine is comprised of antigens for three or four virulent influenza strains
- Vaccine causes antibodies to develop in the body about two weeks after vaccination
  - Antibodies provide protection against infection with viruses that are in the vaccine.

Definitions

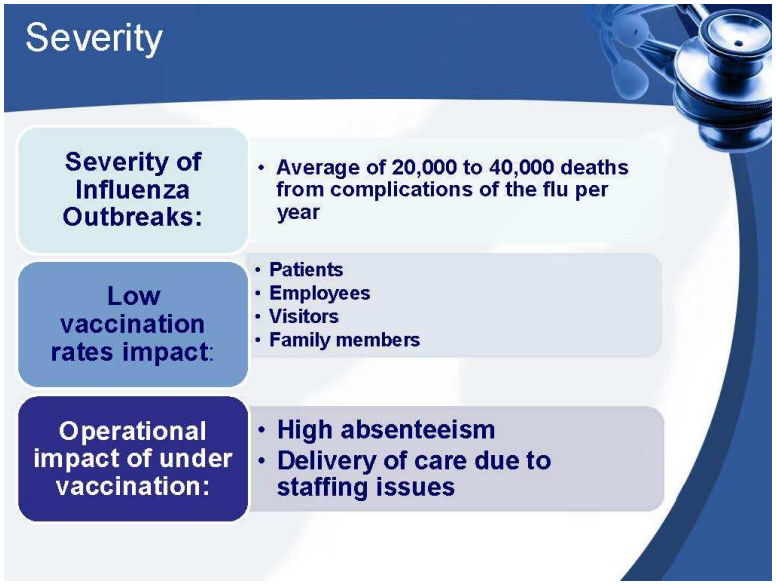
Influenza Consent & Declination Form:

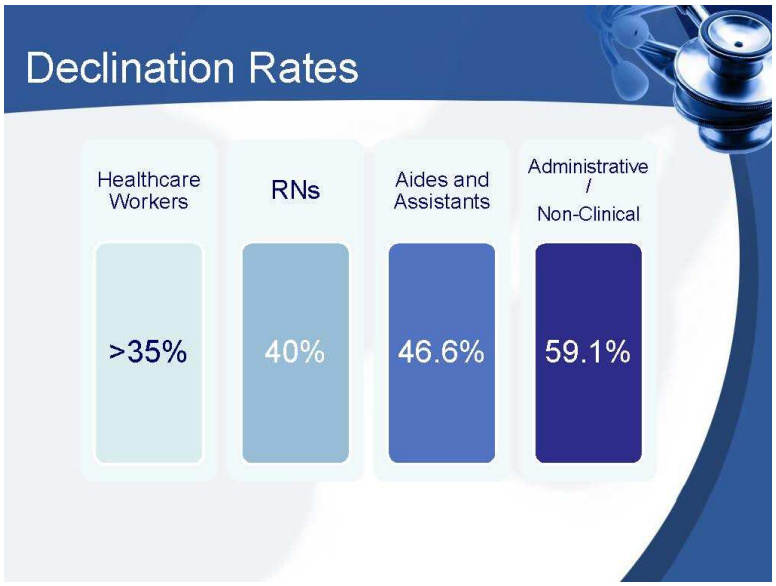
Signed form of understanding that is completed during seasonal influenza period of time that serves numerous purposes.

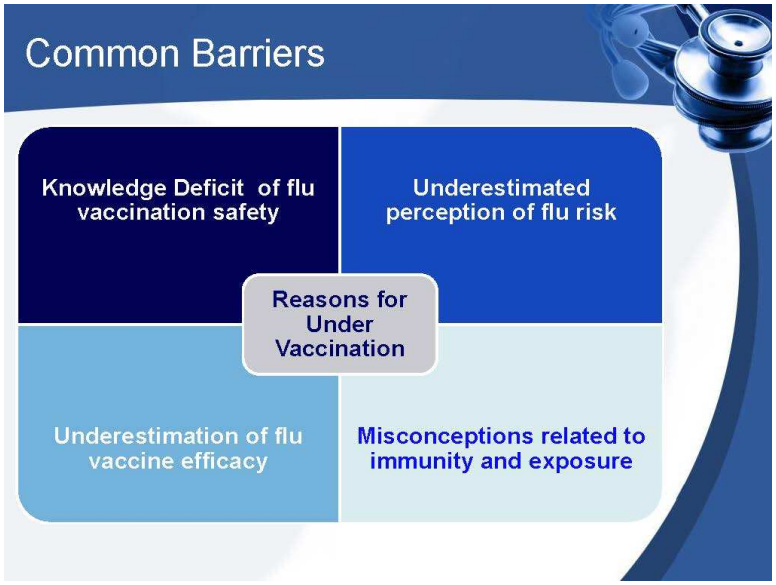
- Document that states that employers offered flu vaccination to employees who work in healthcare environment.
- Denotes that employee has received and understands information given about the risks and benefits of the vaccine.
- If eligible and decline the influenza vaccination RISK and COMPLICATIONS are acknowledged on the form.

Form also acts as a waiver for employees who are not eligible due to clearly defined criterion on the consent form.


Susceptibility
3-5 million severe cases annually
36 cases per 100 individuals
Roughly 1 in 3 in individuals will have flu
25% of Population is ill each year
250,000 – 300,00 deaths annually
Health Care Workers
• Increased risk of contracting the virus from patient, colleague and visitor contact
• Increased risk spreading the virus to other co-workers, patients, visitors and own family members.


Severity
Severity of Influenza Outbreaks:
• Average of 20,000 to 40,000 deaths from complications of the flu per year
Low vaccination rates impact:
• Patients
• Employees
• Visitors
• Family members
Operational impact of under vaccination:
• High absenteeism
• Delivery of care due to staffing issues

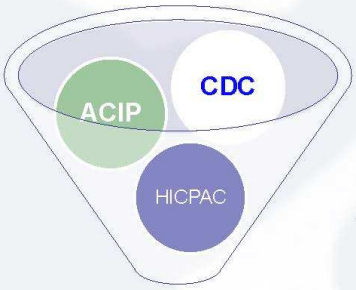

Declination Rates
Healthcare Workers
>35%
RNs
40%
Aides and Assistants
46.6%
Administrative / Non-Clinical
59.1%


Common Barriers
Knowledge Deficit of flu vaccination safety
Underestimated perception of flu risk
Reasons for Under Vaccination
Underestimation of flu vaccine efficacy
Misconceptions related to immunity and exposure

Vaccine and Ethics

- Influenza Vaccination – *mandatory vaccination program **questions** HCWs*
  - Right to autonomy
  - Freedom of choice
  - Right to refuse treatment
- Influenza Education – *mandatory education program*
  - Require all HCWs to complete an education session about influenza and the vaccination method
  - Studies have shown vaccination rates increased from 36% to 64%

Benefits

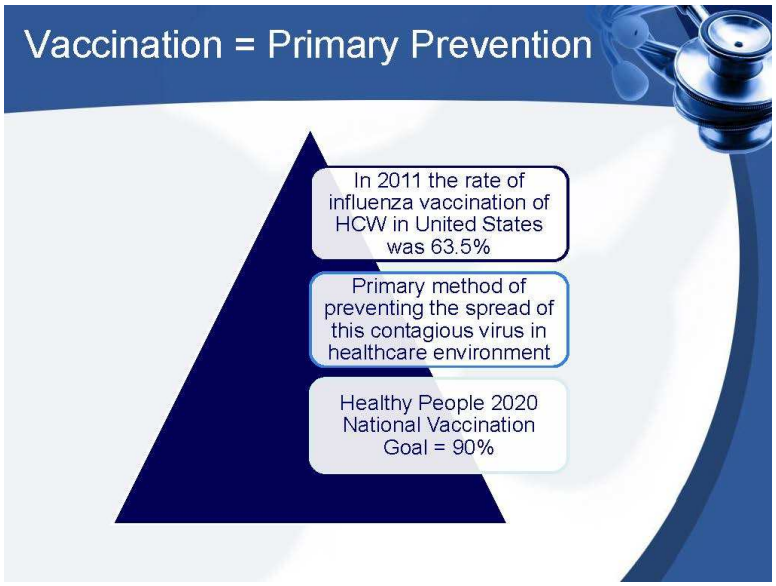


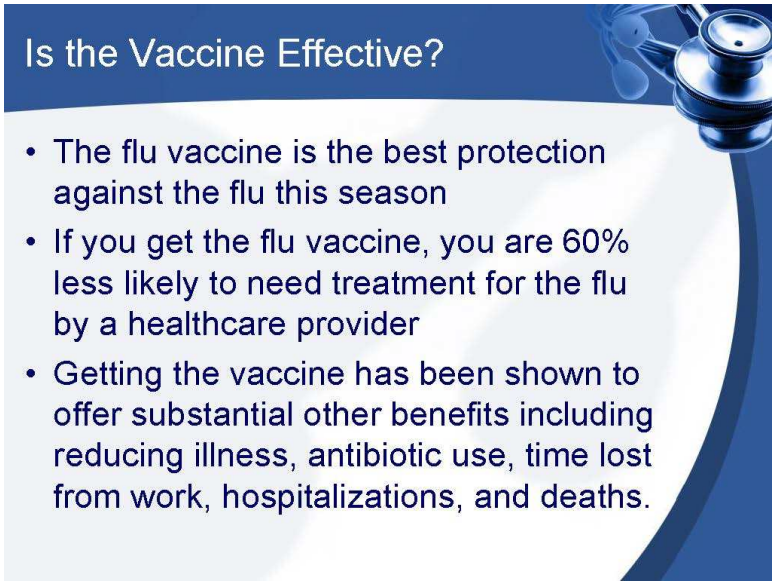
Recommend **ANNUAL** Vaccination

CDC= Centers for Disease Control

ACIP = Advisor Committee on Immunization Practices

HIPAC = Healthcare Infection Control Practices Committee


Vaccination = Primary Prevention
In 2011 the rate of influenza vaccination of HCW in United States was 63.5%
Primary method of preventing the spread of this contagious virus in healthcare environment
Healthy People 2020 National Vaccination Goal = 90%

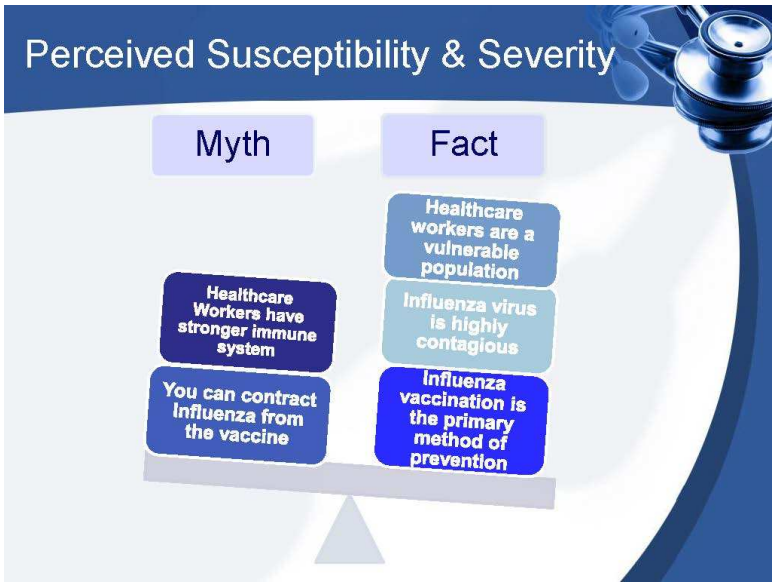

Is the Vaccine Effective?
• The flu vaccine is the best protection against the flu this season
• If you get the flu vaccine, you are 60% less likely to need treatment for the flu by a healthcare provider
• Getting the vaccine has been shown to offer substantial other benefits including reducing illness, antibiotic use, time lost from work, hospitalizations, and deaths.

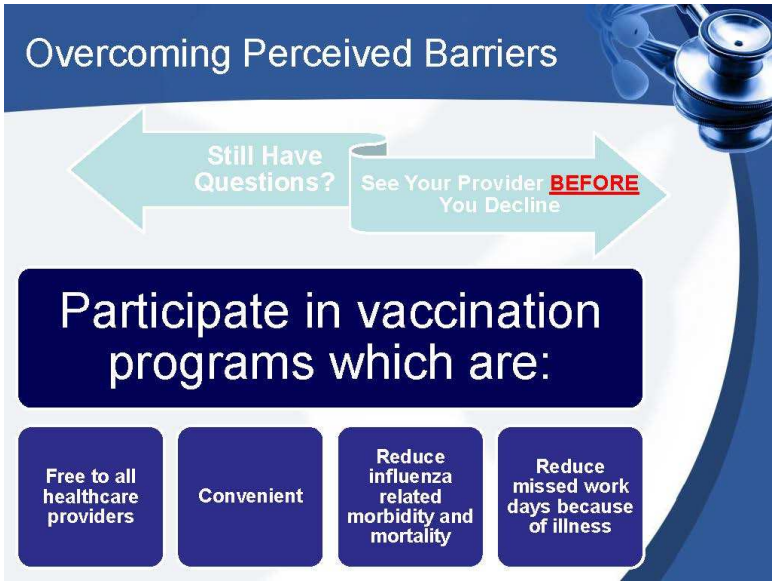
Who Should Be Vaccinated?

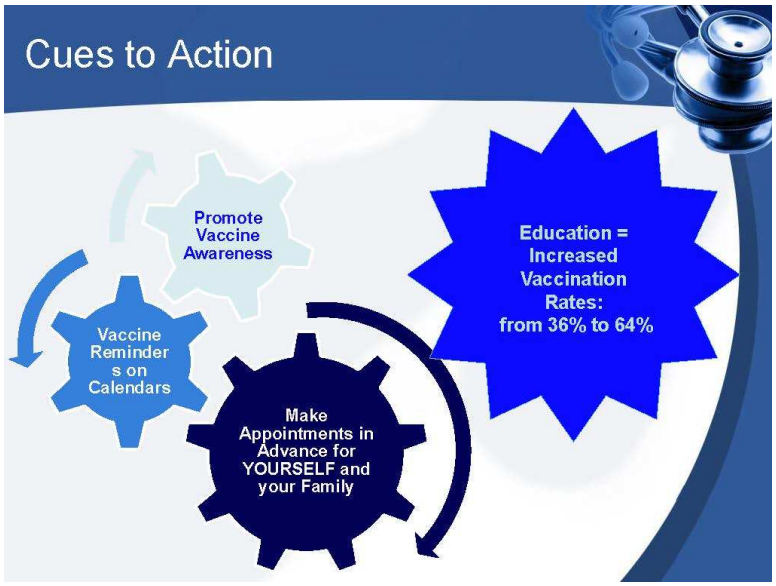
- Children & Infants
- Pregnant Women
- Seniors
- People with Disabilities
- People with Health Conditions
- Travelers & People Living Abroad
- Healthcare Workers

Is the Vaccine Safe

- Seasonal flu vaccines have a very good safety track record. Although there are possible side-effects to vaccination, the Centers for Disease Control and Prevention and the Food and Drug Administration closely monitor the safety of seasonal flu vaccines.


Perceived Susceptibility & Severity
Myth
Fact
Healthcare workers are a vulnerable population
Healthcare Workers have stronger immune system
Influenza virus is highly contagious
You can contract Influenza from the vaccine
Influenza vaccination is the primary method of prevention


Overcoming Perceived Barriers
Still Have Questions?
See Your Provider BEFORE You Decline
Participate in vaccination programs which are:
Free to all healthcare providers
Convenient
Reduce influenza related morbidity and mortality
Reduce missed work days because of illness


Cues to Action
Promote Vaccine Awareness
Vaccine Reminder s on Calendars
Make Appointments in Advance for YOURSELF and your Family
Education = Increased Vaccination Rates: from 36% to 64%


Self- Efficacy →
Take the Next Step
Assist with conducting training programs & workshops in your hospital
Provide encouragem ent to other healthcare workers
Demonstrate advocacy for influenza vaccination

Protect Yourself, Family and Patients

Get Your Flu Vaccination

What did you learn?

True or False

- Healthcare Workers have a stronger immune system, therefore immunization is not necessary. FALSE
- Seasonal influenza vaccine is comprised of antigens for 3 or 4 virulent influenza strains. TRUE
- Comprehensive vaccination programs are cost effective. TRUE
- HCWs are at an increased risk of contracting & spreading the virus to other co-workers, patients, visitors and own family members. TRUE

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Appendix C: Announcement Flyer

INSPIRA MEDICAL CENTER VINELAND NURSES

Influenza Vaccine Education

IS *NOW* AVAILABLE ON HEALTHSTREAM

Learn more about the history, safety and effectiveness of seasonal flu vaccines in less than twenty minutes with this free online program!

Log into HealthStream —> Review "My Courses" —> Click on "Influenza Vaccine Education Program"

inspira HEALTH NETWORK

Participation in the educational program is voluntary and will not impact employment or evaluation

Appendix D: Email Announcement

Dear Inspira Medical Center Vineland RN:

A voluntary Seasonal Influenza Vaccine educational program is now available on HealthStream®. The brief (less than twenty minute) program will review the history of influenza vaccination, its safety and effectiveness.

You can access this program by clicking HERE (*hyperlink – Inspira Health Stream).*

1. Log into your HealthStream® account.
2. Review your "My Courses"
3. Select "Influenza Vaccine Education Program"

Thank you for your participation!

Terri L. Spoltore, MSN, RN, CCRN

Vice President of Patient Care Services – Inspira Medical Center Woodbury
Doctor of Nursing Practice Student – Walden University

Participation in the educational program is voluntary and will not impact employment or evaluation

Appendix E: Cover Letter and Survey

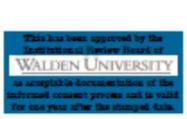
Evaluating the Effectiveness of an Educational Intervention on Influenza Vaccination

Dear Participant:

An Inspira Health Network Nursing employee (who is also a Walden University Doctoral Nursing Student) is conducting a study to examine the effectiveness of an educational intervention relating to seasonal influenza vaccination practices. Completion of the study's survey is voluntary and anonymous. Although the primary investigator is an employee of Inspira Health Network, they have no jurisdiction or responsibility for the sites where this research is being conducted thus limiting any potential conflicts of interest. Volunteers are sought to provide their perspectives on their influenza vaccination decisions. The purpose of this study is to examine the impact of influenza vaccination education on vaccine acceptance. The researcher requests that you complete the following survey after you have either consented for and received the influenza vaccination or completed the vaccination declination form. The following survey should take approximately < 5 minutes to complete, you will not be compensated for your participation. Neither your name nor any identifying data will be collected or included on any report of the study. Your responses to the survey are strictly confidential. You can choose to stop completing the survey at any time without penalty or consequence. There are no foreseeable risks associated with completing the survey. The results of this study may help develop further educational programs related seasonal influenza prevention through vaccinations. After completion, surveys should be deposited in the locked drop box located in the Employee Health Office or at the Employee Health Vaccination Clinic site. The act of returning the completed survey will constitute as your consent to participate in the research. You have the right to retain a copy of a duplicate of this form if desired (marked participant copy not for analysis). If you have questions regarding this study please contact the primary investigator (Terri Spoltore, MSN, RN, CCRN) at SpoltoreT@ihn.org or 856-853-2024). Questions regarding your rights as a research participant can also be directed to Walden University at 1-800-925-3368 ext. 312-1210 from within the USA, or email address irb@waldenu.edu. Walden University's approval number for this study is 01-20-16-0122701 and it expires January 19, 2017.

Thank you,

Terri Spoltore, MSN, RN, CCRN



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Evaluating the Effectiveness of an Educational Intervention on Influenza Vaccination

An Inspira Health Network Nursing Leader (who is also a Walden University Doctoral Nursing Student) is conducting Institutional Review Board (a committee responsible for overseeing research activities and participant welfare) reviewed Nursing Research to examine the effectiveness of an educational intervention relating to seasonal influenza vaccination practices. Although the primary investigator is an employee of Inspira Health Network, they have no jurisdiction or responsibility for the sites where this research is being conducted thus limiting any potential conflicts of interest. Data is being collected from all nurses subject to the Inspira annual influenza vaccine campaign. The purpose of this study is to example the impact of influenza vaccination education on vaccine acceptance. The study requests that you complete the following survey after you have either consented for and received the influenza vaccination or completed the vaccination declination form. The following survey should take approximately < 5 minutes to complete, you will not be compensated for your participation. Completion of the study's survey is voluntary and anonymous. Neither your name nor any identifying data will be collected or included on any report of the study. Your responses to the survey are strictly confidential. You can choose to stop completing the survey at any time with penalty or consequence. There are no foreseeable risks associated with completing the survey. The results of this study may help develop further educational programs related seasonal influenza prevention through vaccinations. After completion surveys should be deposited in the locked drop box located in the Employee Health Office or at the Employee Health Vaccination Clinic site. The act of returning the completed survey will constitute as your consent to participate in the research. You have the right to retain a copy of a duplicate of this form if desired (marked participant copy not for analysis). If you have questions regarding this study please contact the primary investigator (Terri Spoltore, MSN, RN, CCRN) at SpoltoreT@ihn.org or 856-853-2024). Questions regarding your rights as a research participant can also be directed to Walden University at 866-492-5336

Please Indicate Your Primary Nursing Role

__ Nursing Executive (VP, Director, etc.)
__ Nursing Leader (Manager, ANM, etc.)
__Clinical Nurse (bedside staff nurse)
__ Non-Clinical Nurse (Informatics, Education, Case Manager, etc.)

Please Indicate Your Primary Department

__Critical Care or Step Down __Medical-Surgical Unit

__Surgical Services __Maternal Child Health
__Emergency Department __Cancer Center
__Cath Lab/IR __Dialysis
__ Other (please indicate)

Please Indicate Your Highest Educational Level
__Doctorally Prepared __Graduate Prepared
__Bachelor's Prepared __Associate's Prepared

Please indicate the campus where you are employed:
__ Inspira Medical Center Vineland
__ Inspira Medical Center Elmer

Are you eligible to receive the influenza vaccination (i.e. no allergy to the vaccine or its components and no history OR no medical restriction prohibiting vaccination)?
__ YES
__ NO

1. Did you receive vaccine in the previous year

___ YES __ NO

2. Did you attend/receive/participate in education

___ YES __ NO

3. Did you receive vaccine this year

___ YES __ NO

4. Have you had seasonal flu in the past two years

___ YES __ NO

ADD here Comments or suggestions regarding education
Voluntary contact number

Appendix F: Flu Vaccine Consent

Employee Health Department-Vineland

1505 W. Sherman Avenue
Vineland NJ 08360
Phone: 856-641-8694
Fax#: 856-641-7913

FLU VACCINE CONSENT 2015

I, _____, consent to receive the flu vaccine.

(PRINT NAME)

It has been explained to me that there may be a small reaction such as soreness, redness, and possibly fever, usually lasting one to two days. I also understand that I should NOT receive this vaccine if I am allergic to eggs, or neomycin, receiving steroids, immune-compromised, or pregnant without first consulting with my attending physician. I have also read the attached information sheet.

_____ _____ _____

PATIENT SIGNATURE **SS# (Last 4 Digits)** **DATE OF BIRTH**

_____ _____ _____ _____

STREET ADDRESS **CITY** **STATE** **ZIP CODE**

_____ _____

HOME PHONE **INSPIRA DEPARTMENT**

ALLERGIES: _____

NAME OF VACCINE: FLUARIX

LOT#: **EXPIRATION DATE:**

SITE GIVEN: ☐ **LEFT DELTOID** ☐ **RIGHT DELTOID**

ADMINISTERED BY: _____ **DATE:** _____

Appendix G: Declination Form

Employee Health Department-Vineland

1505 W. Sherman Avenue
Vineland NJ 08360
Phone: 856-641-8694

Declination of Influenza Vaccination

My employer or affiliated health facility, Inspira Health Network, has recommended that I receive the influenza vaccination to protect the patients I serve.

I acknowledge that I am aware of the following facts:

- Influenza is a serious respiratory disease that kills an average of 36,000 persons and hospitalizes more than 200,000 persons in the United States each year.
- Influenza vaccination is recommended for me and all other health care workers to protect our patients from influenza disease, its complications, and death.
- If I contract influenza, I will shed the virus for 24–48 hours before influenza symptoms appear. My shedding the virus can spread influenza disease to patients in this facility.
- If I become infected with influenza, even when my symptoms are mild or non-existent, I can spread severe illness to others.
- I understand that the strains of virus that cause influenza infection change almost every year, which is why a different influenza vaccine is recommended each year.
- I understand that I cannot get influenza from the influenza vaccine.
- The consequences of my refusing to be vaccinated could have life-threatening consequences to my health and the health of those with whom I have contact, including
  - my patients and other patients in this health care setting
  - my coworkers
  - my family
  - my community

Despite these facts, I am choosing to decline influenza vaccination right now for the following reason:

- ☐ Allergy to components in vaccine
- ☐ Already received flu vaccine this year from_____ (provide record to Employee Health)
- ☐ Religious beliefs
- ☐ Personal preference

I understand that I can change my mind at any time and accept influenza vaccination, if vaccine is available. I have read and fully understand the information on this declination form.

Signature: _____ Date: _____
Name (print): _____
Department: _____DOB: _____

Reference: CDC. Prevention and Control of Influenza with Vaccines—Recommendations of ACIP at www.cdc.gov/flu/professionals/acip/index.htm

Appendix H: Survey

Evaluating the Effectiveness of an Educational Intervention on Influenza Vaccination

An Inspira Health Network Nursing Leader (who is also a Walden University Doctoral Nursing Student) is conducting Institutional Review Board (a committee responsible for overseeing research activities and participant welfare) reviewed Nursing Research to examine the effectiveness of an educational intervention relating to seasonal influenza vaccination practices. Although the primary investigator is an employee of Inspira Health Network, they have no jurisdiction or responsibility for the sites where this research is being conducted thus limiting any potential conflicts of interest. Data is being collected from all nurses subject to the Inspira annual influenza vaccine campaign. The purpose of this study is to example the impact of influenza vaccination education on vaccine acceptance. The study requests that you complete the following survey after you have either consented for and received the influenza vaccination or completed the vaccination declination form. The following survey should take approximately < 5 minutes to complete, you will not be compensated for your participation. Completion of the study's survey is voluntary and anonymous. Neither your name nor any identifying data will be collected or included on any report of the study. Your responses to the survey are strictly confidential. You can choose to stop completing the survey at any time with penalty or consequence. There are no foreseeable risks associated with completing the survey. The results of this study may help develop further educational programs related seasonal influenza prevention through vaccinations. After completion surveys should be deposited in the locked drop box located in the Employee Health Office or at the Employee Health Vaccination Clinic site. The act of returning the completed survey will constitute as your consent to participate in the research. You have the right to retain a copy of a duplicate of this form if desired (marked participant copy not for analysis). If you have questions regarding this study please contact the primary investigator (Terri Spoltore, MSN, RN, CCRN) at SpoltoreT@ihn.org or 856-853-2024). Questions regarding your rights as a research participant can also be directed to Walden University at 866-492-5336

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__Maternal Child Health
__Cancer Center
__Dialysis
__ Other (please indicate)

Please Indicate Your Highest Educational Level

__Doctorally Prepared
__Graduate Prepared

Please indicate the campus where you are employed:
__ Inspira Medical Center Vineland
__ Inspira Medical Center Elmer

Are you eligible to receive the influenza vaccination (i.e. no allergy to the vaccine or its components and no history OR no medical restriction prohibiting vaccination)?
__ YES
__ NO

__Bachelor's Prepared __Associate's Prepared

1. Did you receive vaccine in the previous year

   ___ YES __ NO

2. Did you attend/receive/participate in education

   ___ YES __ NO

3. Did you receive vaccine this year

   ___ YES __ NO

4. Have you had seasonal flu in the past two years

   ___ YES __ NO

Appendix I: Poster Presentation

An Evidence-Based Strategy to Improve Influenza Vaccination Rates Among Nurses in Hospitals

inspira HEALTH NETWORK

Evidence-Based Practice Quality Improvement Project
Terri L. Spoltore MSN RN CCRN

Background

- *Influenza flu is a serious respiratory virus that causes significant mortality and morbidity; Annual world outbreaks result in 3-5 million severe cases ; between 250,000 and 500,000 deaths*
- *Healthcare (HCW) are a vulnerable population with increased risk of contracting and spreading the virus; impacting organizational quality and financial outcomes*
- *Annual vaccination of HCW is the primary method of influenza prevention*

Purpose of Project

- *IHNV 2013-2014 season acceptance rate was 52% of RNs; Below Healthy People 2020 national benchmark of 90%*
- *Purpose of this project was to improve the influenza vaccination rates among RNs in an acute care hospital with no existing formal education using a web-based educational program focused on influenza risk, vaccine safety and efficacy.*

Project Setting, Design and Data Collection

Setting: *Inspira Health Network New Jersey. Vineland (IHNV) campus served as the primary site for the educational intervention. Elmer (IHNE) was a comparison group in evaluating the program's effectiveness.. IHNE nurses were anonymously surveyed about their vaccination status.*

Design: *Quasi-experimental non-equivalent control group design was used for testing the effectiveness of the selected intervention, a 15 minute voluntary web-based influenza virus and vaccination educational learning program guided by principles from the Health Belief Model using existing internal web-based computerized program, HealthStream®*

Data Collection: *A brief survey served to collect data from two non-equivalent groups: nurses at IHNV who received the intervention (web-based education) and those working at IHNE, who did not.*

Results of Project

Education:
- 145 Views
- 79 Study Participants

Participants:
- Total n=192
- IHNV = 116
- IHNE = 76

Table 1: Vaccine Rates by Education
- Significantly higher vaccine rates were seen in educated nurses
- X2=7.210, p=0.007

Table 2: Vaccine Rates by Campus
- No significant difference in vaccine rates between campuses
- Vaccine Rates Higher at Elmer (historically seen)
- X2=0.318, p=0.573

Additional Finding
- 39 nurses previously unvaccinated
- 11 were educated
- 10 accepted vaccine this year

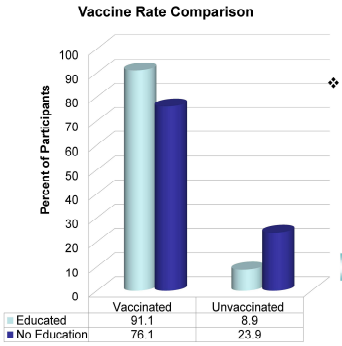
Demographic Analysis
- No significant relationship between education, role or practice specialty and vaccine decision
- Previous vaccine was associated with re-vaccination

Table 1. **Analysis of Vaccine Rates by Education Status**

	Educated (IHNV)	Not Educated (IHNV & IHNE)
Vaccinated	72	86
Unvaccinated	7	27

Table 2. **Analysis of Vaccine Rates by Campus**

	IHNV	INHE
Vaccinated	94	64
Unvaccinated	22	12



Implications for Practice

- *Review of data suggested that an evidence-based educational program has led to an increase in the vaccination uptake for RN*
- *Future research is necessary to identify the relationship between healthcare organizations ability to reduce direct cost and resources to the treatment of the influenza flu for both the patient and HCW through the use of an evidence–based educational program.*

Contact Information

Terri Spoltore
Vice President of Nursing
Inspira Health Network
Woodbury
spoltoret@ihn.org

Appendix J: Research Brief

*** RESEARCH BRIEF ***

An Evidence-Based Strategy to Improve Influenza Vaccination Rates Among Nurses in Hospitals

Primary Investigator: Terri Spoltore, MSN, RN, CCRN

Purpose/Background: Seasonal influenza (flu) is a unique public health issue in that it also directly impacts health care workers (HCW) and the health care delivery system. Numerous organizations, including the Centers for Disease Control and Prevention (CDC) recommends flu vaccination for all eligible individuals, especially HCWs. Evidence based strategies for increasing vaccine uptake by HCWs suggests addressing common knowledge deficits and misconceptions regarding vaccine safety and efficacy. Consequences of influenza in the acute care setting include transmission of infection to patients and colleague and absenteeism. These and other consequences can result in increased healthcare costs and diminished quality.

Methods: A web-based education program was offered to all nurses working at Inspira Medical Center Vineland via the HealthStream ™ platform (intervention site). Announcements and fliers regarding the education were disturbed at the intervention site. The education was not offered at Inspira Medical Center Elmer (comparison site). Nurses who presented to Flu Vaccine Clinics at both sites were presented with the study survey after they had completed their vaccination consent form and been vaccinated or after they had completed the vaccine declination form. The voluntary and anonymous survey collected demographic information, information regarding previous influenza exposure, previous vaccination, exposure to the educational intervention and current vaccine decision.

Participants: All Registered Nurses working at either the Vineland or Elmer campus and not restricted from vaccination (due to allergy, etc.) were eligible for inclusion. Participants self-selected to participate with the act of returning the completed survey to a locked drop-box indicating their consent. A total of 192 surveys were returned, 116 from the Vineland site and 76 in Elmer. The educational program was viewed a total of 145 times. Of the surveys returned at the Vineland site, 79 reported having viewed the education. Ideally, 80 participants who participated in the education and 80 who did not would have been recruited to this study to allow for x^2 analysis.

Results: Clinical nurses constituted the largest group of respondents (68.8%) and the majority of respondents were prepared at the BSN level (67.2%). Vaccine acceptance rates were similar between the Vineland and Elmer sites (81.1% and 84.2% respectively). However, vaccination rates among nurses who participated in the education were significantly higher (x^2=7.210, p=0.007) than those who did not participate in the education (91.1% versus 76.1%). Significant difference related to other demographic variables (practice type, specialty and education) were not seen. Of particular note is the fact that all but one of the nurses who completed the education but had not been previously vaccinated chose to receive the vaccine this year.

Conclusion: Based on these findings, it appears that participation in the educational program positively impacted the vaccine decisions of nurses. Subsequent analysis should be conducted to determine the impact of the educational program on overall vaccine rates at each site and absenteeism related to influenza. This study was limited by the limited timeline under which it was conducted, largely related to the seasonal nature of the vaccine campaign. However, given the low cost and low effort associated with the delivery of the education, it is recommended that HBM education program become a mandatory requirement for all HCW in the future.